

## Primary Outcome of Emotional Burnout Studies of Siberian Railway Locomotive Engineers

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### Abstract

*The article represents the primary outcome of studies of emotional burnout expression and development of Siberian railway locomotive engineers of various age groups and work experience. Most attention is drawn to the preservation problem of their health and stable working capacity that influence railroad-traffic safety. The information about absence of distinct connection between symptoms of emotional burnout and work experience became available. The materials of the studies allow verifying the existing in literature statement about the nature of emotional burnout and also bring out scientific discussion about influence of age and personal traits of specialists in various areas on emotional burnout expression. The results of the studies can be applied in comparative analysis of emotional burnout among representatives of related or other professions.*

**Keywords:** emotional burnout, professional burnout, mental burnout, locomotive engineer, psychognostic tools.

### 1. Introduction

The problem of emotional burnout is described by a wide range of special books (Bodrov, 2013, 23-34; Burisch, 1989; Vodopianova, 2005; Vysotskiy, 2006, 110–120; Freundenberger, 1974, 159–166; Maslach, 1998, 63 – 74; Polyakova, 2014, 420–425, 279-282) and has been studied in both theoretical and experimental ways for a long time period. However, scientists do not have concurrent views on the structure of emotional burnout and the nature of its development.

Peculiarities of emotional burnout development among representatives of various professions and its influence on other arrears of a person's life should be explained due to the ambiguous interpretation of factors that contribute to emotional burnout expression, which also determines development of scientific discussion.

Information about interconnection between the length of work experience and emotional burnout are rather contradictory. Most studies state the absence of significant correlations between the indicated parameters. Only some works reveal negative relationship between them (Orel, 2001, 90–101; "Psychological science and education" journal, 2013; Sidorov, 2008). The relationship between work experience and probability of professional burnout occurrence is described: the longer work experience is the lower probability to get professional burnout is. M.M. Skugarevskaya states that a long work experience together with unsatisfactory career progress leads to disaffection with work and, consequently, results in professional burnout development. Thus, long work experience should positively correlate to the possibility of career progress, which helps to avoid an employee's burnout development (Skugarevskaya, 2002, 30–37).

The authors of the article stick to the opinion that the terms "emotional burnout", "professional burnout" and "mental burnout" are identical and imply such psychic state that is a result of one's own work and is characterized by chronic fatigue and emotional indifference. It implicates spiritual bankruptcy, depersonalization and reduction of professional achievements.

Traditionally emotional burning out is considered for persons of auxiliary professions, however, by taking into account the multidimensionality of the topic in question we limited our tasks with studying emotional burnout among specialists whose work does not refer to "helping" professions, namely Siberian railway locomotive engineers. We focused on the problem of their health preservation and stable working capacity that influence railroad-traffic safety. We brought out such criteria as age and work experience and revealed their correlation to the level of psycho-emotional disorders that accompany emotional burnout.

## 2. Method

The following methods were used: 1) inventory on behaviour and emotion connected with work (Arbeitsbezogenes Verhaltens und Erlebensmuster, AVEM) worked out by U. Schaarschmidt and A. Fischer in Psychological Institute of Potsdam University and abridged by T. I. Ronginskaya (Ronginskaya, 2002); 2) Minnesota Multiphasic Personality Inventory (MMPI) worked out in 1940 by S. Hathaway and J. McKinley (Sobchik, 2007).

AVEM is a multiple-factor diagnostic tool that allows determining people's behaviour in professional sphere. It consists of 66 statements that are united in 11 scales, defined with the help of factor analysis. They reflect person's responses to requirements of professional area and types of behaviour that are formed on the basis of these responses. MMPI consists of 550 statements that build 10 basic diagnostic scales. Respondents (people of 16 years and upwards with IQ not lower than 80) are to choose a reply to each statement: "true", "lie", "cannot say". The replies that coincide with the answer key get one point. The results of this inventory give information about general condition of the personality, prevailing individual traits and possible deviations from the individual's norm. The selected tests have common thematic scope and similar scales that reveal this or that personal trait. At the same time, particular results distribution gives grounds for speaking about the respondent's emotional burnout level.

## 3. Sample Group

20 locomotive engineers from Krasnoyarsk motive-power depot who work on Siberian railway took part in the research (Table 1).

**Table 1.** Sample group characteristic according to age and work experience

Sample group	Age				Work experience			
	28–37 years old		38–47 years old		2–6 years		7–11 years	
Locomotive engineers	n	%	n	%	n	%	n	%
		16	85	4	15	10	50	10

Profession of locomotive engineer refers to stress-producing professions because it is characterized by the following traits: specialists of this area organize train traffic, provide for safety of people's lives, cargo, rolling stock and other technological base, and clearance of traffic. They also bear responsibility for significant economic costs risk reduction. Their job is accompanied by harmful working conditions, a number of production environment factors that influence health and working capacity. Thus, total amount of stimuli that have an impact on a locomotive engineer during one run sums up to about 7 thousand, 800-900 of which are of production significance (Kaptsov, 2007, 1–7). Increase of psycho-emotional stress in locomotive teams is also connected with relative immobility and monotonous character of their work. These characteristics do not condition extreme nature of professional activity, but they make it challenging and require special adaption to it.

It is no coincidence that ability to hold and switch attention, preparedness to quick reaction, ability to perform monotonous work within a long period of time and to handle stress refer to professionally important qualities of a locomotive engineer or a second engineer (Vulfov, 2007).

## 4. Results

### 4.1 Data analytics according to AVEM method

10% of locomotive engineers (type B) have emotional burnout syndrome. All the other three types of behaviour and emotion in working environment are also present. From the sample group 25% of locomotive engineers refer to risk group

(A – risky type), 25% are characterized by healthy type (G – healthy type) and 40% have average professional motivation (S – economic type) that results in reduction of energy consumption. These data prove that a significant part of employees develop behaviour traits that contribute to efficient labour activity and preservation of mental health in professional area. Particular risk indices can be explained by stressful and extreme nature of the profession in question which is connected with high risk and probability to get mental and physical overloads that in its turn can condition further development of burnout syndrome.

While comparing behaviour types of locomotive engineers of various age groups we receive the following results: the first age group (28-37 years old) 33.3% of respondents have “economic” S-type, 11.8% - type B, 23.5% - type G, 33.3% - type A. In the second age group (38-47 years old) the numeric data distributed in the following way: 33.3% - type G, 41.2% - type S and 23.5% - type A. There are no representatives of type B in the second age group.

Thus, the age of those under survey plays an ambiguous part. On the one hand, there were no differences noticed in behaviour and emotion types in profession “locomotive engineer” in both age groups. Among “young” respondents (28-37 years old) as well as among senior respondents (38-47 years old) more permissive and safe behaviour types (G and S) are present. There is also risk type (A), and its level is higher among locomotive engineers of 28-37 years old. On the other hand, we can see the difference, i.e. in the first age group professional burnout was revealed. It proves a troubling fact that health of young specialists is at risk. The indices shown signal the incompleteness of adaptation period among the “newcomers” in profession or, probably, the insufficient formation of psychological defense mechanism from loads and tension of working environment (according to the results, young specialists choose permissive economic behaviour at work in less cases).

AVEM analysis of behaviour types in connection with work experience showed that for locomotive engineers from both groups all four behaviour and emotion types in working environment are common. The first group (2-6 years) includes more respondents with healthy behaviour type (30%) than the second group (20%). Nevertheless, there are more respondents who care about their health in the second group (7-11 years) – 60%, whereas among those who worked within 2-6 years there are only 20%. This data can be logically explained by young age and little experience of the first group (they are “healthy, but inexperienced”). Here we also revealed indices of higher risk for health among locomotive engineers with 2-6 years of work experience. And these indices are supported by 10% of respondents with burnout type. Burnout syndrome was also found among 10% of representatives of the second group (7-11 years of work experience). These data reflect the following situation: locomotive engineers with a longer work experience, as well as their inexperienced colleagues, are subjected to risk of further burnout development, but unlike the former, the latter (the “senior” group) developed quite a reliable psychological defense mechanism from professional stress and tension.

Study of the age and work experience influence on the respondents’ psychoemotional state allows drawing the following conclusions:

- a considerable part of railway workers express behaviour lines that contribute to efficient labour activity and preservation of psychological health in professional area. But this does not reduce extreme and stressful nature of the profession of locomotive engineer. The risk of occurrence and development of professional burnout still exists;
- the age of the respondents plays an ambiguous part in burnout syndrome development. On the one hand, it does not influence psychoemotional state of the respondents. On the other hand, the less the age is, the higher the risk of burnout syndrome development is.

It is possible that younger locomotive engineers are still on the stage of adaptation and adjustment to the new position description. Not enough time passed yet for them to get used and work out efficient psychological defense mechanisms from harmful labour conditions and learn to spend their energetic resources in a sensible way.

The analysis of behaviour types in connection with work experience showed that the risk of development and the disease itself are common for both groups. Locomotive engineers with a longer work experience as well as their inexperienced colleagues are not protected against further burnout development, and some of them already have it. But as compared to the younger, the “senior” group of engineers care more about their health (that is proved by the higher percentage of economic behaviour type if compared with the first group) thus reducing the risk and possibility of burnout development.

So, we revealed high correlation dependence between the age of the workers and burnout. The lower the age is, the higher the burnout is. This criterion (age) and groups of locomotive engineers selected by this criterion will be taken into account in further data interpretation.

As it was stated before, AVEM methodology is directed to determination of people’s behaviour types in professional environment. It gives information on such sides of personality as professional activity, mental stability, and emotional attitude to work. Based on the analysis of all scales marks we can draw a number of conclusions.

Firstly, younger locomotive engineers put more efforts and energy into work. Their labour is characterized by stronger devotion in comparison with their senior colleagues.

Secondly, due to recent beginning of working activity and presence of more theoretical knowledge rather than practical skills young locomotive engineers want to make a good showing and to get established at work. So, they do their best to perform their professional duties. Overmotivation to work is accompanied by high investment of energy. This is one of the factors of further professional burnout development. Mature workers try to use their efforts in a conservative way. They act at work more thoughtfully and with less energetic costs for themselves and their health.

Thirdly, scrupulous attitude to official duties is stipulated by the ambition of inexperienced workers for professional growth and career development which is required but the profession of locomotive engineer itself (the workers pass exams in occupational safety, tests on manuals of locomotives and go through other means of theoretical knowledge checking). Practice requires excellent knowledge of theory in the profession of locomotive engineer. In the beginning of their career inexperienced engineers want just establish in profession, they do not build any far-reaching plans about their career. Such replies are common not for the whole sample group, but for a part of it. These workers are ready for high investment of energy. Most of them do not preserve their efforts, exhaust themselves with work when it is necessary, and give all their energy to work. The second group of locomotive engineers did not show such tendency.

Fourthly, young locomotive engineers strive for perfection. Their attention focuses strongly on the quality of duty performance. They set high standards for themselves while fulfilling professional duties (the work should always be done in a perfect way). They believe it is better check several times rather than have a result with mistakes. Most of them do not want to finish work until it is completely perfect. Only then they are satisfied with the result. Workers of the second group also express highly-professional attitude to the work they performed for years. But they try to make efforts in a sensible way.

Fifthly, half of the sample group of the young locomotive engineers have the ability to keep a distance towards work. But it is complicated for them to switch off the thoughts about work; particular time should pass until it happens. Thus, relaxation ability exists, but it is not strong among engineers of this group. They need to form efficient and stable psychological relaxation mechanisms. These mechanisms are much better formed in the second sample group of engineers, because they forget about work easier and with less tension.

Sixthly, evident majority of young respondents do not tend to become reconciled or refuse further actions if failed. At the same time, sometimes it is complicated for them to start working again because next fail can reduce their confidence in positive result. Such engineers are not easy to cope with the failure. They can lose the wish to work. However the respondents of this group try to rehabilitate themselves. The majority of the engineers from the second group do not stop making efforts, do not lose courage and keep working in the complicated situation.

Seventhly, most of the engineers think that difficulties exist to be overcome. So, they undertake further attempts after they fail. Failures do not discourage the engineers of both groups, but they induce them to making more efforts. Thus, they use active strategy of problem solving and have optimistic expectation about their future.

Eighthly, a significant number of locomotive engineers noted that it is easy to disturb their balance although they do not have an anxious character, feeling of mental stability and balance is peculiar to them. These traits are important for people of this profession from professional point of view. Nevertheless, in this case we face a disturbing fact that a particular number of workers have a high level of anxiety. It is confirmed by low marks given to the statement "Stressful situations and agitation around me leave me indifferent". The results of this scale prove that the respondents try to show exterior quietness hiding a growing feeling of anxiety behind it.

Ninthly, almost all the engineers noted successfulness of their professional life, presence of labour achievements. A small part of the group expressed dissatisfaction with their work that brought only disappointments and losses.

Tenthly, half of the respondents expressed satisfaction with their lives based on their professional experience, success and achievements. They feel optimistic about their future, because they do not have anything to complain of, although the respondents of the first group do not completely deny the fact of presence of unpleasant experience. Feeling of social assistance, trust and family support, feeling of social well-being – the locomotive engineers under survey reasonably receive all these.

#### 4.2 *Data analytics according to MMPI method*

The results of studies according to MMPI method represent information about general state of a personality, its prevailing individual traits and possible deviations of the individual from the norm. With the use of this inventory we studied personal peculiarities of railway workers of various ages. General rates of the scales used speak about mental health and stability of most of the respondents (75%). It should be mentioned that according to the results professional selection which is

very important at railway service chooses special, suitable people. Such individuals are not used to give up if they fail, they strive for overcoming difficulties, making decisions confidently and getting new experience. Although marks according to the individuality scale give grounds to speak about poor imagination, template thinking, cool-headedness and pragmatism of locomotive engineers, it does not prevent them to remain rather balanced personalities apt to compensate through consciousness control.

At the same time, the other part of the sample group showed opposite results, if compared to the above described. Some locomotive engineers (25%) tried to flatter their answers in the beginning of the study. Either it is explained by their need for communication, which they probably tried to receive by drawing the psychologist's attention, or they wanted to protect themselves and hide their real personality from the researcher.

Locomotive engineers show adherence to standard criteria in social surroundings as well as in the sphere of the organism physiological functions. They highly appreciate their post description and strictly follow them. Such behaviour is characteristic of "locomotive engineer" profession. However, constant keeping oneself within particular bounds will not bother only for some time) and in the end can result in "protest" of the organism's inner resources. And this, in its way, will be a reason for pre-existing disease and for further burnout syndrome. So, in the early stages psychological interference of a specialist is necessary to prevent a person from drudgery.

As a result of the studies locomotive engineers with low mood (20%) connected with negative emotions were revealed. They displayed particular individual peculiarities, such as proneness to nervousness about fails, to anxiety, to high guilt with self-critical attitude to their own vices, with lack of self-confidence which can be probably explained by the negative emotions and by consequences of unpleasant life experience. These respondents are highly sensitive and are subject to environmental impacts. They are driven by motivation of failure avoidance, sensitivity, set for congruent relationships with the surroundings. 30% of the engineers expressed absence of caution in activity and of nicety in moral matters, reduced ability to empathy, affirmations inconformity, rude and strict behaviour pattern, cynical view on life. It is possible that just because of such incautious behaviour these people are in the risk group. Nevertheless, locomotive engineers' strive for success, active position, confidence in their abilities can be seen through the results and it will positively influence their mental health. Everything depends on their wish and on the professionalism of the psychologist who will work with them.

## 5. Discussion

The conducted research on the professional burnout phenomenon among locomotive engineers of various ages and work experience allows drawing the following conclusions:

- 1) a considerable number of locomotive engineers express behaviour traits that contribute to efficient labour activity and preservation of mental health in professional environment. But it does not reduce extreme and stressful nature of the profession of locomotive engineer. The risk of occurrence and development of professional burnout among locomotive engineers still exists;
- 2) work experience does not have crucial significance. Burnout symptoms are found among engineers that has worked for two years as well as among those with a longer than 20-years work experience. However, "senior" group of locomotive engineers care more about their health, thus reducing the risk and possibility of burnout development unlike their inexperienced colleagues;
- 3) the age of the surveyed plays an ambiguous part in burnout syndrome development. On the one hand, it does not influence psychoemotional state of the respondents. On the other hand, vice versa, the lower age is, the higher risk of burnout syndrome development is;
- 4) personal detachment and increased professional motivation of locomotive engineers have a great influence on the occurrence and development of burnout syndrome;
- 5) level and nature of development of professional burnout syndrome depend on personal peculiarities of railway workers. For locomotive engineers that refer to healthy, active, economic behaviour type in professional environment "healthy" personal traits are characteristic, such as active position, emotional stability, confidence, social cooperation etc. And vice versa, those who have such personal traits as proneness to nervousness about fails, to anxiety, to high guilt with self-critical attitude to their own vices, with lack of self-confidence and others, are subject to burnout syndrome.

The problem of health and stable working ability preservation is acute for workers of all professional groups in railway transport. It acquires special relevance among locomotive engineers who are responsible for railroad-traffic safety. Rather high requirements of professional selection together with constant medical control over functional state of the organisms were supposed to contribute to preservation of health of engine crew at the higher level than that of

workers from other spheres. Nevertheless, a complex of negative factors of labour activity, each of them not being strongly harmful for health, brings to real reduction of the whole organism functioning level, down to higher incidence level with a few nosological entities, including cold-related diseases, coronary artery disease, high blood pressure, degenerative spine diseases and radiculitis. Reduction of physical load at work (hypodynamia) on the background of high neuroemotional tension taking into account nonscheduled labour conditions and absence of regular nutrition regimen represent the main complex of negative impact.

Choice of prevention methods and their usage rate depend on the health level. The highest level is considered to be the first, which is characterized by complete adaptation of organism to the environment conditions. Consequently, health condition of such people is valued as "relatively healthy". The number of people with such health level among the trainees of engine crew is insignificant.

The second level includes people whose health level can also be estimated as relatively healthy. However this exterior well-being is provided with mobilization of additional interior resources of the whole organism. Herewith, functional condition of the organism moves to the area which is characterized by obvious tension of adaptation mechanisms. As extended studies showed, such health level among people with a train work experience of not less than 5 years is found in about 25% of the surveyed. It should be taken into account that notwithstanding enormous natural potential reserves this period of organism functioning at the end of tether does not last long and depends on a number of factors. Among these factors there are, first of all, intensiveness of influence on the organism of environmental negative factors, including industrial factors, and, second, absence of prevention measures (rehabilitation) of health condition. At constant conditions of labour and life and without taking particular measures to compensate for the impact of negative factors on the organism state the organism will proceed to the third functioning level.

The third level is described by break of adaptation mechanisms and development of functional (reversible) abnormalities in separate organs and systems of the organism, i.e. there appears initial stage of diseased condition.

The fourth and fifth levels of health condition are determined by deepening of the diseased condition with occurring structural (irreversible) abnormalities in organs and systems of the organism. And this in its turn leads to temporary or constant loss of working ability.

The highest efficiency of realization of preventive and rehabilitative measures comes out at the stage of their introduction on the first and second health levels. Successful results will depend on the person under rehabilitation, on his serious attitude to health and regular and purposeful work on its recovery.

## 6. Conclusion

It should be noted, that emotional burnout is specific not only for "assisting" professions. This phenomenon as a sign of over-strain can exist in any profession as well as beyond professional activity (Vulfov, 2007; Skugarevskaya, 2002, 30–37; Sobchik, 2007). As the research showed, development of the present topic is acute due to direct connection of emotional burnout syndrome with health preservation, mental stability, reliability and professional longevity of specialists. It is important not only to be aware of the problem, but to accept the responsibility for work and professional result. It is necessary to change the way of thinking, including reassessment of goals, realization of one's own abilities, limits, development of a positive view on life.

We still need to continue studies on the mechanisms of psychological defense that an individual develops in the form of complete or partial exclusion of emotions in response to selected stressful impacts. A locomotive engineer's work is distinguished by particular complication; it represents a unity of objective and subjective parameters, requirements to technological and communicative competence. Safety-related nature of a locomotive engineer's work stipulates various stressful situations that create conditions for emotional burnout syndrome occurrence. Consequences of emotional burnout can reveal in psychosomatic disorders as well as in strictly psychological deviations. Unfortunately, in some cases emotional burnout syndrome development goes very far. Stable negative attitude to work, customers, and colleagues is present. In such cases it is necessary to change the working area, to transfer to an administrative position, to improve the skills of stress control.

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