

Integration of a Simple Assessment Tool for Psychosocial Risk Factors with Physical Health and Safety

Authors:

Joan Burton *B.Sc., R.N., M.Ed.* IAPA, Canada

Martin Shain *S.J.D.* Centre for Addiction and Mental Health, Canada

Ivan Szlapetis *B.Sc., C.C.P.E.* IAPA, Canada

The Problem

Evidence shows that certain kinds of stress represent major threats to employee wellbeing.ⁱ Those that are particularly dangerous are having too much to do in too short a time over too long a period; having too little influence over the day to day means, manner or method of one's work; mental fatigue associated with prolonged effort; and feeling seriously unrewarded, unacknowledged or unappreciated for one's work.

These "psychosocial factors" are often shortened respectively to the four terms *demand, control, effort* and *reward* and are described in Karasek's Demand-Control model and Siegrist's Effort-Reward Imbalance model.

IAPA (Industrial Accident Prevention Association) works with Canadian businesses to help them improve their health and safety records and reduce or eliminate hazards to employees' health, safety and well-being. When working with small and medium-sized enterprises (SMEs) that are concerned with their workers' compensation statistics, the concept of psychosocial hazards is not an easy sell. Yet it is unlikely that businesses will be very successful in permanently reducing their workers' compensation statistics without addressing psychosocial factors as well as the physical factors in the workplace. There is therefore a need to demonstrate to employers the link between psychosocial factors and more traditional indicators of health and safety, in a manner that is simple, understandable by those who may be unsophisticated in statistical analysis, and non-threatening.

The Approach

IAPA Ergonomists, including the third author, have found a way to use a simple psychosocial measurement tool, integrated into more traditional health and safety assessments. They are then able to make a clear linkage to back pain, for employers. This approach uses colourful graphics to demonstrate statistical correlations in a way anyone can understand.

The Tool: SSOS and BHCI

The Stress-Satisfaction Offset Score (SSOS) and Business Health Culture Index (BHCI) is a simple assessment tool for psychosocial risks that was developed and validated for Health Canada by the second author. This tool consists of four questions about demands, control, effort and rewards in a job, and when scored mathematically, gives a simple quantitative measure of the degree to which workplace stressors and satisfiers are working for or against the health of an individual or business.

(See *Figure 1* for the actual tool.)

The *four questions* ask about the degree of agreement with the following statements:

1. I am satisfied with the amount of involvement I have in decisions that affect my work (*“control”*).
2. I feel I am rewarded (in terms of praise and recognition) for the level of effort I put into my job (*“reward”*).
3. In the last 6 months, too much time pressure at work has caused me worry, “nerves” or stress (*“demands”*).
4. In the last 6 months I have experienced worry, “nerves” or stress from mental fatigue at work (*“effort”*).

The mathematical scoring system results in a score that lies between –2 and +2. The tool informs the participant that a score above zero means that they likely experience more satisfaction than stress at work, and feel they are treated fairly. A score above +1 means that there is a good chance the participant experiences good health and well-being. On the other hand, a score below zero means the participant experiences more stress than satisfaction, and a sense of being treated unfairly at work. A score below –1 suggests the participant may be at risk for a range of health and capacity-related ailments.

The SSOS is an individual measure. When all the SSOS scores for an organization or a department are averaged, the mean score is called the Business Health Culture Index (BHCI), and is a measure of the extent to which the health culture of the organization (or department) is working for or against its business objectives.

The SSOS/BHCI tool has been tested and validated by Health Canada.ⁱⁱ It has been shown to be remarkably consistent in its ability to capture the same health-related concerns as would be determined by much longer surveys. It has also been shown to be strongly correlated to various measures of physical and mental health problems – everything from high blood pressure or joint/muscle pain, to depression or inability to concentrate. The test-retest reliability of the SSOS has been established in the 0.90 - 0.95 range in a series of studies where groups were compared at 3-month intervals and where no formal intervention to change working conditions was known to have occurred. Conversely, the SSOS was found to be sensitive to deliberate attempts to change working conditions, in that scores in such environments showed varying degrees of change over the same 3-month period.ⁱⁱⁱ

Integration with Health & Safety

While academics recognize the link between psychosocial factors and physical ailments like back pain, most Canadian employers do not. In Canada, more than 50% of lost time injuries are musculoskeletal disorders, including back injuries. When faced with employee complaints about back pain and rising workers' compensation claims for back injuries, the typical SME in Ontario, Canada, will look for a physical solution and may contact IAPA for an ergonomic assessment of the workplace. They may not respond favourably to discussions at this stage about the “culture” of the workplace, or questions about psychosocial factors. Therefore IAPA's Ergonomists have begun to integrate psychosocial factors into their ergonomic surveys of employees. In a typical employee questionnaire that asks questions about health status, symptoms, the location and severity of musculoskeletal pain, and work practices, the Ergonomists now embed the four SSOS questions. When the surveys are returned, the Ergonomists calculate the BHCI score for the enterprise (or departments within the enterprise) and correlate that score with the scores of self-reported back pain.

Correlation

A typical range of BHCI scores for departments within a SME is illustrated in the example in *Figure 2*. As can be seen, Groups 1 and 4 have negative BHCI scores, so that in general, stress outweighs satisfaction in these departments, and the health culture within those departments could be working against their business goals. Groups 2 and 5 have positive scores, and Group 3 has a very high positive score, suggesting that satisfaction outweighs stress in these departments, and the health culture will be working to support the business goals.

When the measures for back pain and other physical symptoms are plotted for these departments, a similar range of scores results. *Figure 3* shows, using the same example, the scores for back pain in the various departments. Visually positioning the two bar charts one above the other shows the correlation clearly. It is immediately apparent that Groups 1 and 4, which have the negative BHCI scores, also are experiencing the highest degree of back pain. Groups 2, 3 and 5, which have positive BHCI scores, are experiencing much less pain. (Note: In this example, all five Groups do work which is physically similar, mostly administrative and office work.) While a table with numbers could demonstrate the correlations, using a visual aid makes the relationships instantly recognizable, with red representing “bad” and green representing “good” and yellow representing an intermediate state.

Figures 2 and 3 are one example, but this kind of correlation has been seen in several projects of this nature. When data from 7 SMEs was combined (for a total of 143 individuals) and the SSOS scores correlated with the experience of back pain, the overall correlation was -0.43 , with $p < 0.01$. That is, the most self-reported back pain is associated with the greatest degree of stress outweighing satisfaction in the workplace (lowest SSOS scores). The relationship between back pain and the SSOS scores seems to be the highest in the manufacturing sector, with one enterprise having a correlation of -0.82 .

Conclusion

This approach has proven to be an effective knowledge transfer exercise for IAPA. Employers who are presented with colourful charts such as these quickly grasp what was previously, to them, a rather esoteric and academic concept – that there is a relationship between back pain and stress in their own workplace. They may ask, “Is the stress causing the back pain, or is the back pain causing the stress?” The more cynical may state, “The ones who are unhappy are just complaining of back pain because they’re unhappy!” The Consultant must interpret the results for the employer in a way that does not imply causation. Instead, the emphasis must be on the linkage – of physical and psychosocial workplace factors, and to solve problems with either one, both should be addressed. The good news for the employer is that by addressing both at the same time (for example, by a participatory ergonomics approach), not only will back pain and physical injuries be improved, but so will employee morale, satisfaction and productivity.

This approach provides a rather dramatic visual connection that is useful for starting a conversation with the employer about some of the non-physical issues surrounding back pain or other physical complaints. It has allowed the IAPA Ergonomists to work more effectively with SMEs in reducing not only their physical injuries, but their organizational culture issues as well.

This simple instrument could be used by SMEs to assess their levels of psychosocial risk, and the predictable effects on health and safety. Or, it could be used by internal or external consultants to draw attention to the fact that physical pain or injuries may be influenced by psychosocial factors.

Figure 1

Stress & Satisfaction Offset Score* (SSOS) A Self-Assessment

Step 1

Circle the number that best describes how you feel about the following:

↓

Step 2

Put your score in the box.

↓

Step 3

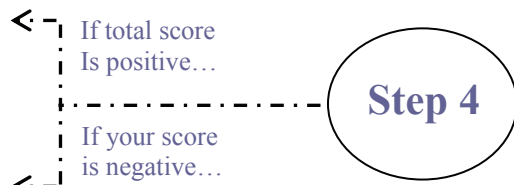
Tally the scores.

↓

| | Agree Strongly | Agree | Not Sure | Disagree | Disagree Strongly | Score | | |
|----------------|---|-------|----------|----------|-------------------|-------|--|-------------------------------------|
| Control | I am satisfied with the amount of involvement I have in decisions that affect my work. | +1 | +1 | 0 | 0 | 0 | | Add the first and second scores ... |
| Reward | I feel I am rewarded (in terms of praise and recognition) for the level of effort I put out for my job. | +1 | +1 | 0 | 0 | 0 | | |
| Demand | In the last 6 months, too much time pressure at work has caused me worry, "nerves" or stress. | -1 | -1 | 0 | 0 | 0 | | subtract the third score ... |
| Effort | In the last 6 months, I have experienced worry, "nerves" or stress from mental fatigue at work. | -1 | -1 | 0 | 0 | 0 | | subtract the fourth score ... |
| Total | | | | | | | | Enter total in the bottom box. ← |

If your score is positive, then you experience more satisfaction than stress at work and, on the whole, you feel you are being treated fairly. If your score is above +1, chances are that you experience superior health and a sense of well-being.

If your score is negative, you experience more stress than satisfaction at work and may feel that you are treated unfairly. If your score is below -1, you are at risk for a wide variety of health and capacity ailments.



Employees who consistently experience high stress and low satisfaction at work suffer the following consequences:

- | | |
|--|---|
| Health Consequences | Capacity Consequences |
| <ul style="list-style-type: none"> 3x Heart problems 3x Back pain 5x Certain types of cancer 2-3x Injuries 2-3x Infections 2-3x conflicts 2-3x Mental health problems 2-3x Substance abuse | <ul style="list-style-type: none"> Reduced adaptability Reduced ability to cope with change Impaired learning Impaired memory Increased helplessness Increased passivity or aggression and conflict |

* Developed by Dr. Martin Shain in collaboration with Health Canada

Figure 2 **example:**
Business Health Culture Index by Department

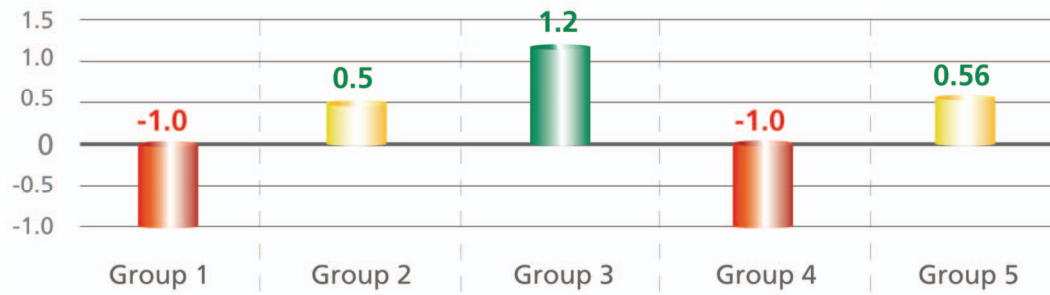
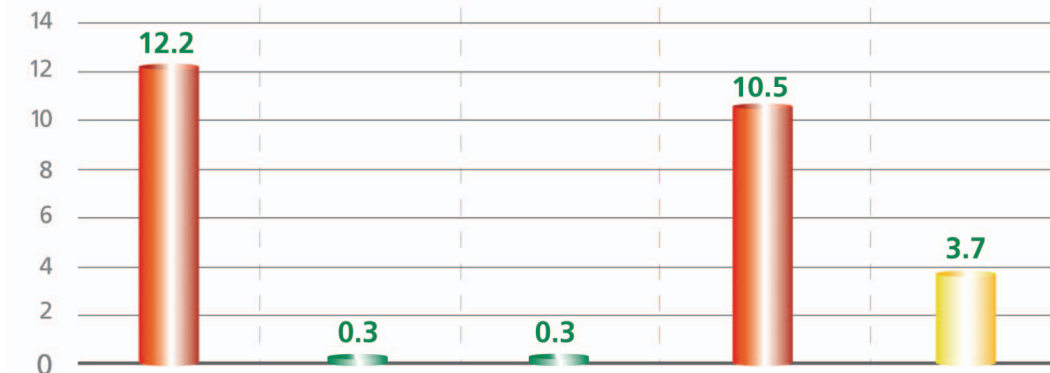


Figure 3 **example:**
Back Pain Index by Department



References

- ⁱ Bosma, H., Peter, R., Siegrist, J. and Marmot, M. (1998). Two Alternative Job Stress Models and the Risk of Coronary Heart Disease. *American Journal Public Health* 88(1): 68-74.
- Cohen, S., Tyrrell, D.A.J., and Smith, A.P. (1991). Psychological stress and susceptibility to the common cold. *New England Journal of Medicine* 325(9): 606-612.
- Courtney, J.G., Longnecker, M.T., Theorell, T. and Gerhardsson de Verdier, M. (1993). Stressful Life Events and the Risk of Colorectal Cancer. *Epidemiology* 4(5): 407-414.
- Elden, M. (1986). Socio-technical Systems Ideas as Public Policy in Norway: empowering participation through worker-managed change. *Journal of Applied Behavioural Science* 22(3): 239-255.
- Gardell, B. (1982). Scandinavian Research on Stress in the Workplace. *International Journal of Health Services* 12(1): 31-41.
- Greenberg, E.S. (1986). *Workplace Democracy: The political effects of participation*. Cornell University Press. Ithaca, New York.
- Greenberg, E.S. and Grunberg, L. (1995). Work alienation and problem alcohol behavior. *Journal of Health and Social Behavior* 36(March) 83-102.
- Johnson, J.V. and Johansson, G. (eds) (1991). *The Psychosocial Work Environment: Work Organization, Democratization and Health*. Baywood Publishing Company. Amityville, N.Y.
- Johnson, J.V., Stewart, W., Hall, E.M., Fredlund, P. and Theorell, T. (1996). Long-term psychosocial work environment and cardiovascular mortality among Swedish men. *American Journal Public Health* 86(3): 324-331.
- Kaplan, M. and Rankin, T. (1993). *Quantitative measures from organizations undergoing major change in the way work is performed: a survey of 18 Canadian workplaces*. Government of Ontario: Toronto.
- Karasek R. (2004) A Vacuum in Political and Economic Labor Policy? *Bulletin of Science, Technology and Society* 24(4) 353-365
- Karasek, R. and Theorell, T. (1990). *Healthy Work. Stress, Productivity and the Reconstruction of Working Life*. New York, N.Y.: Basic Books Inc.
- Kiecolt-Glaser, J.K. and Glaser R. (1995). Psychoneuroimmunology and Health Consequences: data and shared mechanisms. *Psychosomatic Medicine* 57: 269-274.
- Macy, B.A. and Izumi, H. (1993). Organizational change, design and work organization: a meta-analysis, Woodman R.W. and Pasmore W. (eds). *Research in Organizational Change and Development Vol. 7*. J.A.I. Press Inc.
- Matthews, K.A., Cottingham, E.M., Talbott, E., Kuller, L.H. and Siegel, J.M. (1987). Stressful work conditions and diastolic blood pressure among blue collar factory workers. *American Journal of Epidemiology* 126(2): 280-291.
- McEwan B.S. (1997). Hormones as regulators of brain development: life-long effects related to health and disease. *Acta Paediatrica Supplement* 422: 41-44.
- McEwan B.S. (1998a). Stress, adaptation and disease. Allostasis and allostatic load. *Annals of the New York Academy of Sciences* 840: 33-44.
- McEwan B.S. (1998b). Seminars in Medicine of the Beth Israel Deaconess Medical Center: protective and damaging effects of stress mediators. *New England Journal of Medicine* 338(3): 171-179.
- McEwan B.S. (1999). Stress and hippocampal plasticity. *Annual Review of Neuroscience* 22: 105-122.
- Painter, B. and Smith, T.J. (1986). Benefits of a participatory safety and hazard management program in the British Columbia Forestry and Logging Organization. In Brown, O. Jr. and Hendrick, H.W. (eds.). *Human Factors in Organizational Design and Management II*. Elsevier Science Publishers B.V. (North-Holland).
- Polanyi, M.F.D., Cole, D.C. Beaton, D.E., Chung, J., Wells, R., Abdollell, M., Beech-Hawley, L., Ferrier, S.E., Mondlock, M.V., Shields, S.A., Smith, J.M. and Shannon, H.S. (1997). Upper Limb Work-Related Musculoskeletal Disorders Among Newspaper Employees: cross-sectional survey results. *American Journal of Industrial Medicine* 32: 620-628.
- Shannon, H.S., Mayr, J. and Haines, T. (1997). Overview of the Relationship between Organizational and Workplace Factors and Injury Rates. *Safety Science* 26(3): 201-217.
- Shannon, H.S., Walters, V., Lewchuk, W., Richardson, J., Moran, L.A., Haines, T. and Verma, D. (1996). Workplace organizational correlates of lost-time accident rates in manufacturing. *American Journal of Industrial Medicine* 29: 258-268.
- Siegrist J. (1996) Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology* 1(1):27-41
- Smith, M.J. (1997). Psychosocial aspects of working with video display terminals (VDTs) and employee physical and mental health. *Ergonomics* 40(10): 1002-1015.
- Steptoe, A., Evans, O. and Fieldman G. (1997). Perceptions of control over work: psychophysiological responses to self-paced and externally-paced tasks in an adult population sample. *International Journal of Psychophysiology* 25(3): 211-220.
- Tarlov A.R. (1996) Social determinants of health: the sociobiological translation. Chapter 5 in D. Blane, E. Brunner and R. Wilkinson (eds.) *Health and Social Organization. Towards a Health Policy for the Twenty-first Century*. New York. Routledge
- Theorell, T., Tsutsumi, A., Hallquist, J., Reuterwall, C., Hogstedt, C., Fredlund, P., Emlund, N., Johnson, J.V. and the SHEEP Study Group (1997). Decision Latitude, Job Strain and Myocardial Infarction: a study of working men in Stockholm. *American Journal Public Health* 88(3): 382-388.
- ⁱⁱ Shain, Martin The Stress Satisfaction Offset Score (SSOS) and the Stress Satisfaction and Fairness Survey (SSFS) - Technical Notes. Unpublished document, available upon request.
- ⁱⁱⁱ Shain M. and Suurvali H. (2004) "The Neighbour at Work Initiative: an evaluation". Final Report to Health Canada's Population Health Fund. Project #6785-15-2001/0390569.