

Lecture PT5

The Psychology of Risk-taking Behaviour

Torbjørn Rundmo

Professor, Norwegian University of Science and Technology
Trondheim, Norway

AIMS OF THE TALK

Risk behaviour may be reduced either by modifying the behaviour directly by positive or negative reinforcement, or by changing background factors causing the behaviour, i.e. safety attitudes and causal factors of attitudes. In addition, the employees' own judgement of hazards and their risk perception may influence decisions and behaviour. In general, negative reinforcement is not recommended and reinforcement strategies are often problematic from an ethical point of view. It may also be argued that long-term effects of safety countermeasures are best obtained by influencing the factors that may cause risk behaviour.

Attitudes towards safety and accident prevention are primarily interesting for safety promotion work because they may affect decisions as well as individual risk behaviour. Perception of occupational hazards may have the same effect. To be able to influence employees' on-the-job behaviour we have to examine the associations between attitudes, risk perception and behaviour. To influence behaviour we need (1) to have a model specifying all the relevant predictors and (2) examine which dimensions that are the important ones.

Social cognition models aim at predicting behaviour by specifying the relevant "causal" factors of decisions as well as behaviour. Consequently, these models are relevant for occupational accident prevention. Examples of such models are the theory of reasoned action (Ajzen and Fishbein, 1980), the theory of planned behaviour (Ajzen, 1988), the health belief model (Becker and Maiman, 1975), the self-regulation health behaviour model proposed by Leventhal and Cameron (1987), and Triandis' (1977) attitude-behaviour model. What characterises all of these models is that they assume that beliefs and attitudes affect decisions and behavioural choices.

Numerous studies show the capability of these models to predict risk-taking as well as health protection behaviours. However, attitude campaigns and other countermeasures aimed at reducing the number of accidents have been met with scepticism. In Norway some have even argued that it is "a myth" that safety effectively could be promoted by influencing attitudes and risk judgements. This conclusion may be based on the fact that safety campaigns often have been carried out as well as evaluated in a non-professional way by applying non-validated measurement instruments and questionnaires with weak psychometric qualities.

In this talk I will present three different new aspects which I hope may contribute to a better and more appropriate understanding of the determinants of occupational risk behaviour. The aspects are the following:

- 1) Risk behaviour in various settings: If we are able to influence risk behaviour in one setting, e.g. employees in an occupational context, this can also influence off-the-job risk behaviour, e.g. in traffic and during leisure activities and vice versa. The characteristics of the behaviour may be similar or even identical despite the fact that action takes place in different settings. Consequently,

individuals who behave safely in one setting will do so in another. Perhaps the best safety results are obtained by measures that make employees “think safety” in all situations, i.e. influencing employee safety commitment and motivation in general.

- 2) Risk perception and behaviour: Few of the social cognition models include risk perception, i.e. employees’ subjective risk judgements, as a predictor variable. The exception is Becker and Maiman (1975) who include assessment of health hazards as a predictor of health protection behaviours. If it is true that subjective risk judgements are important for health and safety, it becomes important to examine the association between perceived risk and behaviour. Intuitively we assume that risk assessments affect decisions and behaviour and that this is also true in an occupational setting. However, I will show that this is not always the case.
- 3) The association between affect and behaviour: This relates to the fact that all social cognition models are rational. They take for granted that rational thinking is the core determinant of behaviour. Perhaps this is not the case. Affect and feelings may also influence on-the-job behaviour.

1) RISK BEHAVIOUR IN VARIOUS SETTINGS

Triandis’ attitude-behaviour model is one of the few models which include people’s previous behaviour as an important predictor for future behaviour. Several studies have found that previous behaviour is the best predictor of future action. If you tell me what you did yesterday I may be able to predict what you will do in the near future. If you are a smoker today the best prediction is also that you will smoke tomorrow. However, Triandis’ model does not take into account the setting in which the behaviour is carried out. It may well be that settings showing similar characteristics, e.g. exposure to hazards, promote an identical set of behaviours. Nevertheless, identical actions may also be carried out in very different settings. If your safety commitment is high in one situation this will most probably also be the case in other situations. Consequently, your action choices and behaviour will be identical in different settings. If you behave safely on the job you will most probably also do so during your leisure time and as a driver.

A challenge for accident prevention, as well as safety promotion, is often to find an appropriate setting or “arena” to implement countermeasures. In addition to the lack of an appropriate arena for implementing safety measures, the group of recipients is also not homogeneous. If so, the countermeasures will be effective only on selected parts of the group exposed to them. However, if a specific type of behaviour carried out in one setting exerts influence on the behaviour in another, measures aimed at changing the behaviour in one of them may also influence the behaviour on the other. For example more safe behaviour during the conduct of work tasks may also “cause” safer driving and vice versa.

In Norway the so-called Ardal Project carried out within the industrial company Norsk Hydro, aimed to promote safety by enhancing the employees’ priority of safety (Bjerke et al., 1997). Absenteeism from work caused by of-the-job accidents can also incur costs for the employer as well as for society (see Rundmo and S nderquist, 1994). Thus, it is beneficial for industrial companies to implement on-the-job health promoting and accident prevention measures. In addition, a work setting is a good “arena” for implementing countermeasures compared to what is possible for e.g. traffic safety measures. The group of recipients are more homogeneous compared to e.g. a random sample of drivers, and it is possible to influence them more extensively compared to what could be possible in

most other settings. This type of setting also initiates two-way communication about safety more easily. The core aim for safety measures should be to make employees to “think safety” and give priority to safety in all on-the-job and of-the-job situations and settings. The Dyno Nobel Take 5 strategy is an example of such a countermeasure. A work-observe-talk strategy related to occupational safety in Norsk Hydro is another example.

The results presented in Table 1 are based on a self-completion questionnaire survey which I carried out in sixteen plants belonging to the industrial company Norsk Hydro. A total of about 1100 respondents filled out the questionnaire. Table 1 shows associations between three types of self-reported behaviour on the one hand and safety attitudes and risk perception on the other. The three types of behaviour were on-the-job risk behaviour, driver behaviour and behaviour during the conduct of leisure activities. These are the criterion or “effect” variables. A total of fourteen different types of occupational risk behaviours were included. The number of such activities related to leisure activities and traffic related behaviours were respectively two and eight. The criterion variables are shown in the first row of the Table and the predictor variables, i.e. the factors which may influence the three types of behaviours, are shown in the first column. These are entitled safety attitudes and organisational factors, attitude towards accident causation, and risk perception. Each of these three main aspects re made up of sub elements or dimensions. In total about fifty indicators measured these dimensions. As shown, the most significant predictors of risk behaviour were attitudes related to acceptance of on-the-job rule violations. It is interesting also to note that acceptance of rule violations was an important predictor of risk behaviour in traffic (in addition to the dimensions of attitudes). However, the most significant predictor of risk behaviour in traffic was on-the-job risk behaviour.

Employees who carry out their own work safely also drive safely. This indicates that if we manage to reduce on-the-job risk behaviour this would also influence behaviour in other settings. As shown in Table 1 the Table the “effect” of such behaviour on leisure and traffic related behaviour were stronger compared to “the other way around”. This is most probably because the majority of the predictor variables were related to an occupational setting. In total we were able to explain 48 per cent of the variance in occupational risk behaviour. The identical figure for driver behaviour was 22 per cent. It could however be interesting to “turn around” the measures to examine whether or not traffic safety measures have the same effect on occupational risk behaviour. Leisure behaviour was made up of as few as two indicators. This can be the cause of low explained variance for this criterion (see Table 1).

Rule violations and taking chances when carrying out various types of activities may in principal be the same behaviour despite the fact that it is carried out in two different settings. Consequently, countermeasures aimed at more safe behaviour implemented in one setting may “incline” on the behaviour in another setting. “Spill-over” effects are known from other experiences. When “thinking safety” in a certain situation or setting is given high priority, it will also be given priority in other settings. The results presented in Table 1 supports such a hypothesis.

2) RISK PERCEPTION AND BEHAVIOUR

People may only behave safely and take the necessary precautionary measures when they are aware of the hazards they are exposed to. It is often assumed that our risk judgements influence our decisions and actions. Consequently, one reason for studying risk perception is the assumption that perception affects behaviour. However, there are at least three hypotheses about the association between risk perception (i.e. subjective assessments of risk) and behaviour.

Table 1. Effects of attitudes and perceived risk on occupational risk behaviour

Criterion variables Causal factors	Risk behaviour		
	Occupational	Leisure	Traffic
<i>Safety attitudes and org. factors</i>			
Dim. 1. Accept of rule violations			
Dim. 2. Priority of safety versus production			
Dim. 3. Management commitment and involvement in safety			
<i>Attitude towards accident causation</i>			
Dim. 1. Fatalism			
Dim. 2. Belief in accident prevention			
<i>Perceived risk</i>			
Dim. 1. Rational component			
Dim. 2. Affective component			
<i>Risk behaviour</i>			
Occupational			
Leisure			
Traffic			
e	0.52	0.92	0.88
R ²	0.48	0.08	0.22

[$\chi^2=0.61$, d.f. = 1, $p=0.434$, Goodness of Fit Index (GFI)=1.000, Adjusted GFI=.990].

 Strong effect;  Medium effect;  Low effect;  No effect

THIS SHOULD BE A RIGHT HAND PAGE (i.e.ODD NO) to match text

1) *"Misjudgement" of hazards:* It is often assumed that accidents happen because there is something "wrong" with employees' perception of risk. "Misjudgement" of risk may cause inappropriate decisions as well as unsafe behaviour and "human error". Accordingly, several studies have been aimed at classifying such errors. If the "real" risk is "misperceived" it should be corrected and if the demands placed on the individual exceed some assumed "limits" in human "information processing capacity" the factors causing the problems should be removed. In order to avoid accidents tasks have to be fitted to "human limitations" and taken care of in the design phase, e.g. of an industrial plant. Accordingly, information-processing approaches have frequently been included into models of accident causation. However, is it true that perception of risk affects behaviour? Can misjudgements and human error be the core causal factor of accidents?

The basic idea behind all information processing theories can be summarised as follows: (1) we perceive hazards or hazardous risk sources, (2) we evaluate or judge the amount of risk it involves, (3) we decide what to do, (4) we act accordingly, and (5) we evaluate the effects of the action. This way of understanding the relationship between perceived risk and behaviour may seem to be well fitted to our common-sense perception of how we perceive ourselves, i.e. that we decide ourselves what to do.

Misjudgements can only be considered to be a causal factor if it is not true that the more risk a person perceives, the more risky is also his or her behaviour. If this is to be true there has not to be a positive correlation between perceived risk and risk behaviour. Neither can we expect a negative correlation.

Table 2 is a correlation matrix, i.e. a matrix showing the association between risk perception and behaviour. The results show that there are positive correlation coefficients, i.e. the higher the risk is perceived to be by the respondents the more risky behaviour is also reported. The results are based on a questionnaire survey which I carried out amongst offshore oil personnel employed at the Norwegian Continental Shelf a few years ago (Rundmo, 1995a,b, 1996a,b, Rundmo, Ulleberg and Hestad, 1998). About 1800 employees participated in the study (see also Rundmo, Mearns, Flin, Fleming and Gordon, 1996). Perceived risk included employee assessments of potentially-hazardous risk sources related to ordinary occupational accidents (i.e. falling to lower level, crushing by machine parts, slippery surfaces etc.), and catastrophes and major accidents (fire, explosion, noxious gases etc.). The respondents were asked to assess how safe they felt on a list of such sources. The types of risk behaviour, which was assessed, are shown in the first column of the Table. The respondents reported how often they took chances, broke work procedures etc.

The figures presented in Table 2 are correlation coefficients. A correlation coefficient shows the strength of the association between each of the behaviours and risk perception. These figures vary between 0 and 1, where 0 is no correlation and 1 is a perfect correlation (happens very rarely). If the p-value (the significance level) is above 0.05, the correlation is statistically significant or clear. As can be seen, the great majority of the coefficients are very significant, $p < 0.001$. The associations are also positive, showing that the higher the risk is perceived to be by each employee, the more risky is his or her behaviour. The higher an employee perceives the risk to be, the greater is also his or her probability of experiencing an accident. If it was true that accidents were caused by "misjudgements" of risk we should not have found significant associations between perceived risk and behaviour. Consequently, the theory that a "misfit"

between human capacity to handle information and environmental demands was the core causal factors of occupational accidents has little support. However, these results do not show that such misjudgement never appears as a causal factor of accidents. Of course, accidents may happen because employees misjudge the hazards they are exposed to. In some industries personnel are exposed to hazards. It is important for safety that employees are aware of these hazards. On the other hand, a realistic judgement of a rather small probability for an accident to happen does not cause insecurity and worry and in addition, the subjective probability assessment is also very little influenced of such hazards.

Table 2. Associations between risk perception and risk behaviour

Risk behaviour	Perceived risk	
	Ordinary occ. accidents	Catastrophes/ major accid.
<i>How often do you?</i>		
Break safety instructions	.26***	.05
Carry out work procedures which is not allowed	.22***	.04
Not carry out the work correctly	.24***	.13***
Take chances to get a job done	.27***	.09**
Use personal protection equipment	.12***	.04
Break work instructions	.23***	.07*
Total	.31***	.09*

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

2) *Role constrained behaviour*: The second hypothesis is that the affective reactions may be seen as reactions to stress, i.e. a strain factor, which may reduce a person's ability to cope with risk and therefore cause enhanced risk behaviour. "Stress" at work may cause "strain" and affect the capacity to cope. In addition, employees may know when he or she is exposed to a risk source, judge the probability of experiencing an accident to be enhanced, and hence they feel unsafe and worried. Consequently the risk causes affective reactions and strain (Ulleberg and Rundmo, 1997), which may enhance risk taking behaviour and the probability of experiencing accidents and near misses (Rundmo, 1992). Consequently, when an employee is exposed to a risk, an accident may happen because the perceived risk corresponds to the "real" risk. Therefore, to inform employees about "real" risk may enhance the probability of accidents.

For this to be true employees who are exposed to medium or high risk have to report more often that they take chances and break safety rules during their working hours. As shown in Table 2 we also found support this assumption. It is however also important to take into consideration that employee subjective assessments may be influenced by social and organisational factors, e.g. workload, job demands, job control, job satisfaction, social support etc. Several factors of this kind may influence risk perception as well as risk behaviour. To draw decisive conclusions we need to examine how such factors moderate the association between perceived risk and behaviour.

3) *Organisational factors*: For several years research has been carried out aimed at measuring attitudinal, organisational and social aspects relevant to occupational safety (Alexander et al. 1995; Lee, 1995; Rundmo, 1992, 1994, 1995, 1996, 1998; Rundmo et al., 1996). The body of research includes measurement of "safety climate factors" (see Zohar, 1980; Brown & Holmes, 1986; Dedobbeleer & Béland, 1991), theories of accident causation, risk behaviour, safety status, risk perception and safety commitment. Theories of accident causation, like fatalism and belief in accident prevention, as well as employee and management commitment and involvement in safety work, may affect priorities of safety versus production objectives, employee influence on safety decisions as well as safety status. In addition, employee attitudes, safety commitment and organisational factors may directly affect risk perception as well as risk behaviour. Figure 1 is a heuristic model of these relations.

Accordingly, the third hypothesis is that risk judgements and risk behaviour are both dependent variables, which do not affect each other. Table 3 summarises the results of several model tests carried out on the offshore data materials presented above and other studies carried out in the industrial companies Norsk Hydro and recently in Dyno Nobel (see e.g. Rundmo, 1995, 1996). The first column in the Table shows the predictor variables, i.e. the hypothesised "causal" factors and the first row the effect variables. Some of the variables are listed both as a cause and as an effect. This is because they are mediators, i.e. variables which are affected by and at the same time influence other variables. The results show that safety attitudes were the causal factor that exerted the strongest effect on risk behaviour. Commitment and involvement in safety work from management and other employees had the strongest affect on safety status. Safety status was in turn important for job stress as well as perceived risk. However, when we considered the relevant organisational and social factors that can influence perception as well as behaviour, perceived risk was no longer a significant predictor of risk behaviour. The significant correlation between these factors (see Table 2) was most probably caused by the fact that they were both affected by the same causal factors. Thus, for the individual employee it also seems to be the case that his or her behaviour is caused by his or her perceptions and individual decisions.

3) AFFECT AND BEHAVIOUR

A problem with the great majority of social cognition models is that they take for granted that decisions and behavioural choices are based on rational judgements. Risk perception contains a rational as well as an affective component. In many of the studies we have carried out we measured the extent to which respondents "felt safe/ unsafe". The "feeling of safety" - questions included a rational (probability assessment) as well as an emotional component (worry). Rational models assume that it is cognitive belief elements (rational thinking) about a risk source that causes worry and concern (i.e. affective reactions). However, several studies which we have carried out during the last few years, show that empirical data have a rather bad fit to such a model. We have therefore developed a new model entitled the mental imagery approach (Rundmo and Sjøberg, 1995, 1996, 1997, 1998).

In a very well known article in "American Psychologist" Zajonc (1980) discussed the weaknesses with the rational approach. One weakness is that affectivity may be precognitive, i.e. precede rational judgements in time, and consequently could not be a result of rational judgements or cognition. Affectivity related to risk does not always have a rational basis. It may be that it primarily is the affective component of risk perception/

judgements, which is related to risk behaviour. This does not need to be true for rational risk judgements. A basic emotion of worry and concern may influence our rational judgements. Thus the belief elements are not causal factors. Rather they are effects of the emotion related to risk in general. The basic emotion may “seek” the causal rational arguments and beliefs that are in accordance with the emotion. Therefore, it may be wrong to analyse risk perception as if all subjective assessments of risk have an identical role in predicting risk behaviour (see Rundmo & Sjöberg, 1996, 1998, Østvik et al., 1997).

Figure 1. A heuristic working model

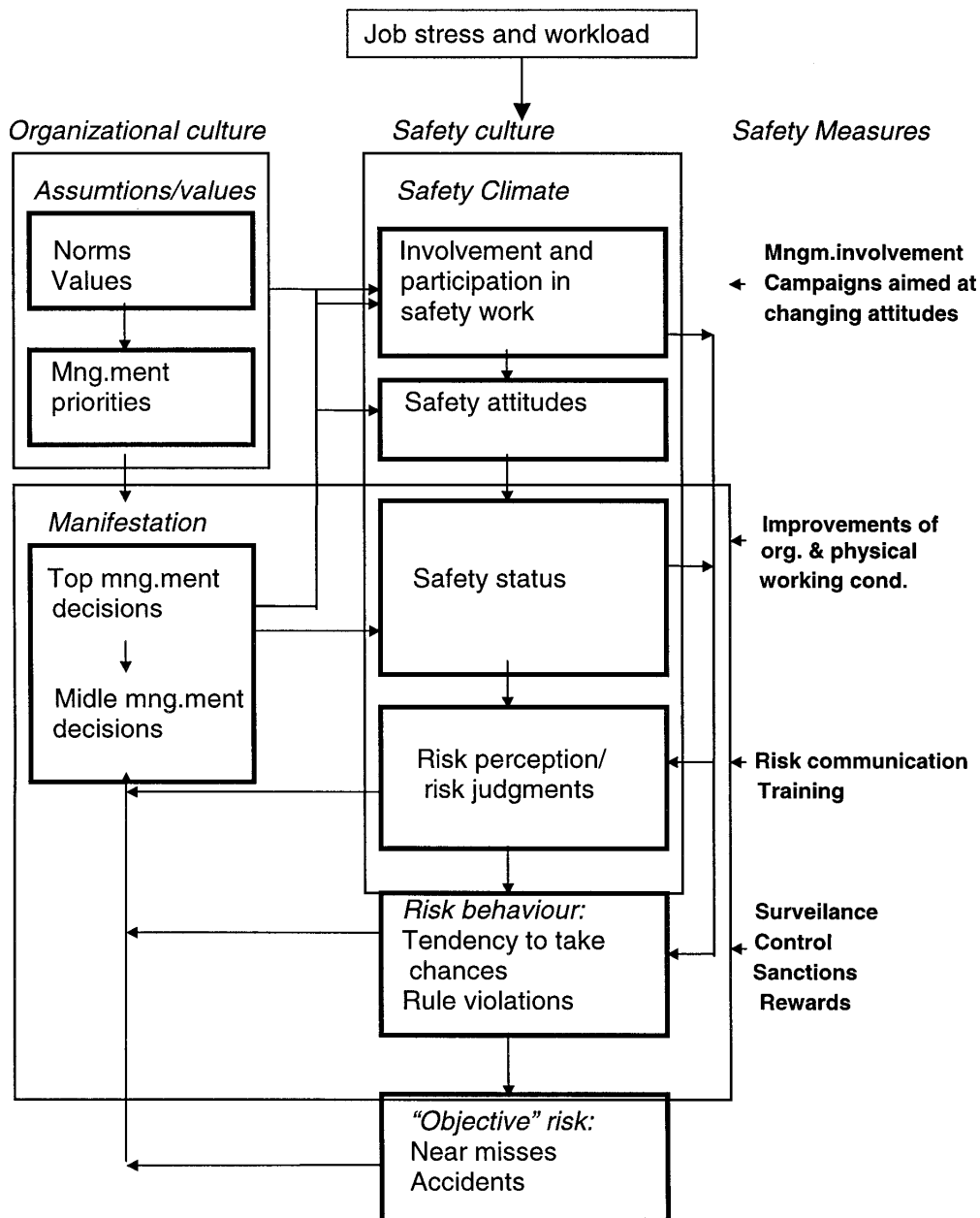


Table 3. Factors affecting safety and contingency measures, job stress, perceived risk, strain and risk behaviour

Criterion variables Causal factors	Safety and contingency measures	Job stress	Risk perception	Workload	Risk behaviour
Involvement and participation in safety work					
Safety attitudes					
Physical workload					
Safety and contingency measures					
Job stress					
Risk perception					
Strain					

[$\chi^2=3.44$, d.f.= 2, $p=0.170$, Goodness of Fit Index (GFI)=.999, Adjusted GFI=.985]

 Strong effect;  Medium effect,  non-significant effect;
 No effect, excluded from the model

In a series of studies we have examined this hypothesis. The results are a bit ambiguous; however, the majority of model tests give support to the mental imagery approach. This conclusion was supported by the results of three different studies. The first was a study carried out to test risk perception amongst employees in one offshore oil company operating on the Norwegian Continental Shelf (Rundmo and Sjøberg, 1995, 1997). The second study included employees in four different branches (industry and public administration) (Rundmo and Ruud, 1996), and the third study was carried out amongst a representative sample of the Norwegian population (Rundmo and Ulleberg, 1997, Ulleberg and Rundmo, 1997). The conclusion from these risk perception studies was that employees' risk judgements are not primarily based on rational evaluations and cognition, but rather on a basic emotion of worry and concern. However, such a conclusion could also be based solely on logical arguments and need not to be based on empirical evidence to support it.

CONCLUSION

Safety attitudes and risk perception are relevant to employees' on-the-job risk behaviour and occupational safety primarily because they influence behavioural intentions. Numerous

studies have shown that attitude towards safety is the most important predictor of behaviour. We also know that some occupational safety attitude dimensions are important predictors and other aspects are totally insignificant. In addition, employee risk perception is a relevant indicator of the safety status. Due to the fact that an identical set of causal factors affect subjective risk judgements as well as behaviour, it is also possible to give a certain priority to the countermeasures. This can be accomplished by knowing the employees' judgements and subjective assessments of risk perception as well as organisational factors related to safety.

REFERENCES

- Ajzen, I. (1986). From intentions to actions: A theory of planned behavior. In: Kuhl, J. & Beckman, J. (Eds.). *Action-Control: From Cognition to Behavior*. N.Y.: Springer.
- Ajzen, I. & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ.: Prentice-Hall.
- Becker, M.H. & Maiman, L.A. (1975). Sociobehavioral determinants of compliance with health and medical care recommendations. *Medical Care*, 13, 10-24.
- Bjerke, W., Hoff, S.A., Kastet, K. & Lund, J. (1997). Aardal - think safety. Industry involvement in injury prevention in a local community. Oslo: Norsk Hydro.
- Fleming, M., Rundmo, T., Mearns, K., Flin, R. & Gordon, R. (1995). Risk Perception and Safety - A Comparative Study of UK and Norwegian Offshore Workers. Paper presented at The Fifth International Conference on Safety and Well-Being at Work. Work & Well-Being. An Agenda for Europe, symposium on Human and Organizational Factors in Occupational Safety, organized by the WHO Centre of Occupational Health and Development, University of Nottingham, Stakis Victoria Hotel, Nottingham, 7 - 9 December.
- Leventhal, H. & Cameron, L. (1987). Behavioral theories and the problem of compliance. *Patient Education and Counseling*, 10, 117-138.
- Rundmo, T. (1992). Risk perception and safety on offshore petroleum platforms - Part II: Perceived risk, job stress and accidents. *Safety Science*, Vol. 15, 53-68.
- Rundmo, T. (1994a). Associations between organizational factors and safety and contingency measures on offshore petroleum platforms. *Scandinavian Journal of Work, Environment & Health*, Vol. 20, 122-127.
- Rundmo, T. (1994b). Associations between safety and contingency measures and occupational accidents on offshore petroleum platforms. *Scandinavian Journal of Work, Environment & Health*, Vol. 20, 128-131.
- Rundmo, T. (1995a). Perceived risk, safety status and job stress among injured and non-injured employees on offshore petroleum installations. *Journal of Safety Research*, Vol. 26, 87-97.
- Rundmo, T. (1995b). Risk Perception and Safety in Norwegian Offshore Personnel. In: *Collected Papers of The Conference "Understanding Risk Perception" - A Special 1-Day Conference on the Role of Risk Perception in Safety Management in the Workplace*. (III: pp. 1-22). The Marcliffe at Pitfodels, Cults, Aberdeen, Scotland, 2nd February.
- Rundmo, T. (1996). Changes in risk perception among North Sea offshore personnel in the period 1990 to 1994. *Safety Science* Vol. 24, 197-209.

Rundmo, T. & Holmefjord, A. (1995). Risk Perception in Norwegian Offshore Workers. Paper presented at The 9th Conference of the European Health Psychology Society, Symposium on Risk Perception and Accident Prevention. Hotel Norge, Bergen, August 28-30.

Rundmo, T., Mearns, K., Flin, R., Fleming, M. & Gordon, R. (1996). A Comparative Study of Risk Perception and Safety in UK and Norwegian Offshore Workers. In: Collected papers of The 1996 Annual Meeting of the Society of Risk Analysis - Europe. Risk in a Modern Society: Lessons from Europe. (pp. 506-507). University of Surrey, Guildford, UK, 3 - 5 June.

Rundmo, T. & Ruud, L.J. (1996). Negative Affectivity and Perception of Risk. Paper presented at The Annual Meeting of The Society for Risk Analysis and International Society of Exposure Analysis, Symposium on Factors Determining Risk Perception. Fairmont Hotel, New Orleans, Louisiana, 8 - 12 December.

Rundmo, T. & Sjöberg, L. (1995). Risk Perception by Offshore Oil Personnel Related to Platform Movements. Paper presented at The 4th European Congress of Psychology, Symposium on Risk Perception and Risk Communication. (Eds.: Hantzi, A. & Solman, M.). Ellinika Grammata, Athens, Greece, 2 - 7 July.

Rundmo, T. & Sjöberg, L. (1996). Risk perception by offshore personnel related to platform movements. *Safety Science*, Vol. 24, 211-227.

Rundmo, T. & Sjöberg, L. Risk perception by offshore oil personnel during bad weather conditions. *Risk Analysis*. [Paper accepted for publication].

Rundmo, T. & Ulleberg, P. (1997). Perceived Risk and Health Behaviour. Paper presented at The 5th European Congress of Psychology. (pp. 194-195). (Book of Abstracts) (Eds.: Cromie, S.D. et al.). Dublin, 6 - 11 July.

Rundmo, T., Ulleberg, P. & Hestad, H. (1998) Organisational factors and workload among offshore oil personnel. *Safety Science*, Vol. 29, 75-87.

Triandis, H.C. (1977). *Interpersonal Behavior*. Monterey, CA: Brooks-Cole.

Ulleberg, P. & Rundmo, T. (1997). Perceived Environmental Risk, Concern and Behaviour. In: *Proceedings of The 1997 Annual Meeting of the Society for Risk Analysis - Europe. New Risk Frontiers*. (pp. 496-504). Stockholm School of Economics, Stockholm, 15 - 18 June.

Zajonc, R.B. (1980). Feeling and thinking. Preferences need no inferences. *American Psychologist*, 35, 151-175.

Østvik, J., Rundmo, T. & Sjöberg, L. (1997). Associations between safety climate and emotional reactions to platform movements. *Safety Science*, Vol. 26, 155-168.