Elklit

Table 26 Correlations between stressor criteria and after-effects Significance with one-way ANOVA, p<

	Exposure	Distance (only exposure group 3)	Anxiety after the explosion	Injured	Knew the dead	Saw the dead	Emotions after	Family reactions
INTRUSION				0 10		0 10	0 05	0 10
AVOIDANCE			0.05	0 05				0 01
IES TOTAL				0 10			0.10	0 05
RATCOP	0 01	0 10				0 001		
EMCOP	0.0001		0 05	0.05		0 001	0 10	
AVCOP	0 10	0.05	0 10					0 05
SOCCOP 1	0 0000		0 05	0 05		0 0000		
SOCCOP 2	0 0001		0 05	0 05	0.0001	0 10		
SOCTHEN 1 listen?								
SOCTHEN 2 survivors?				0.05		0 005		
SOCTHEN 3 express?	0 10							
SOCTHEN 4 sympathy?					0.001			
SOCTHEN 5 practical?								
SOCTHEN 6 feel worse?								
SOCTHEN 7 satisfaction?								
SOCNOW 1 listen?								
SOCNOW 2 survivors?					0 001	0 05		
SOCNOW 3 express?								
SOCNOW 4 sympathy?								
SOCNOW 5 practical?				0 05			0 10	
SOCNOW 6 feel worse?								
SOCNOW 7 satisfaction?								
SOTHEN ALL				0 10				
SOCNOW ALL								
PSYCHOLOGIST					0 05		0 05	0 0000
NO OF SESSIONS	0 10			0 05		0 05		
SATISF INF								
SATISF WORK								
SAFETY FEELING								
OUTLOOK								0 10
GUILT things you did	0 05					0 10		0 10
GUILT failed to do								
GUILT staying alive	0 005	0 005			0 05			
LETTING OTHERS DOWN			0 10				0.05	0 05
LETTING YOURSELF DOWN								
BLAMING OTHERS								
GUILT ALL								

workers from families described as 'shocked' or 'anxious'. Workers, whose families' reactions were described as generally negative or depressed, tended to be more worried in their general attitude to life.

6. Relationship between intermediate variables and outcome variables

In Table 27, a number of statistic relationships appear between a number of intermediate variables on one side and coping strategies, degree of traumatization, social support etc., on the other side.

1) Number of sessions with a psychologist is positively correlated with strong avoidance reac-

tions on the IES. Thus, strong avoidance reactions appear to represent very distressing symptoms when one has to continue working in the same workplace, where the disaster happened.

2) Satisfaction with the management's initiatives and leadership after the disaster was related to social support at the time of the disaster and social support now, with a general satisfaction with the shipyard as a workplace and with a strong feeling of safety at work.

3) Guilt feelings were associated with a high degree of traumatization, the use of emotional and social (instrumental and emotional) strategies of coping.

4) Blaming others was related to a high degree of intrusion, a low level of social support, a low

Table 27 Correlations between intermediate variables and outcome variables

	Sessions with psychologist	Satisfaction management	Guilt 1 Things you did	Guilt 2 Staying alive	Guilt 3 Staying alive	Letting others down	Letting yourself down	Blaming others	Guilt all
RATCOP	0.11	0 03	0 10	0.12	0 12	0 15[1]	0 16[1]	0.11	0.18[1]
EMCOP	−0 18	−0.05	0 19[2]	0.20[2]	0 25[3]	0.25[3]	0 07	0 30[3]	
AVCOP	−0 21	0 03	0 08	−0 08	0 11	−0 00	−0 05	0 10	0 03
SOCCOP 1	0 17	−0.07	0.21[2]	0 19[2]	0 27[3]	0 23[3]	0 29[3]	0.12	0 30[3]
SOCCOP 2	−0 07	−0 10	0 17[1]	0 15[1]	0 29[3]	0 22[2]	0 30[3]	0 12	0 29[3]
SOCCOP 3	0 03	−0.06	−0 06	−0 01	0 08	−0 05	0.11	0 08	0.05
SOCTHEN	−0 28	0 19[2]	−0 08	−0.03	−0 11	−0 02	−0 08	−0 16[1]	−0 14
SOCNOW	−0 26	0 25[2]	−0 07	−0 01	−0 01	−0 05	−0.05	−0 15[1]	−0.08
SAFETY FEELING	−0 14	0 22[3]	−0.11	−0 02	−0 08	−0 05	−0 08	−0 20[2]	−0 15[1]
SATISFWORK	−0 05	0 39[3]	0 04	−0.01	0 07	−0 02	−0 05	−0 27[3]	−0 14
OUTLOOK	0 21	−0 02	0 02	−0 03	0 05	−0 13	0.05	0 00	0.00
AVOIDANCE	0 45[1]	−0 07	0.15[1]	0 06	0.19[1]	0 18[1]	0.07	0 06	0 13
INTRUSION	0 29	0 07	0 15[1]	0 18[1]	0 20[2]	0 23[3]	0 18[1]	0 14[1]	0 25[3]
IES TOTAL	0 40	−0 06	0 19[1]	0.15[1]	0 24[2]	0 22[2]	0 14*	0.14[1]	0.23[1]

Pearson correlation coefficient 2-tailed significance $p<$ [1] 0.05, [2] 0 005, [3] 0 0005
*) The numbers have been increased or reduced to two decimals In this case the precise number is 1376 The neighbor in the next cell at the right is exactly .1435 This difference is enough to make the latter significant while the former is not

feeling of safety at work, and a low degree of satisfaction with the place of work. Blaming others is sometimes perceived as a primary personality trait. Violent and persisting images of the disaster and reduced network support seemed to precipitate and accompany this kind of behavior.

In conclusion the above-mentioned relations give a quite consistent and understandable pattern, which contributes to an added confidence in each variable.

7. Relationship between degree of traumatization, strategies of coping and social support

In Table 28 one finds high positive correlations between the three IES-variables. The same pattern can be seen in many other studies, e.g., Elklit & Andersen (1994) (28).

Table 28 Relationship between IES-variables

	AVOIDANCE	IES TOTAL
INTRUSION	0 48[3]	0 81[3]
AVOIDANCE		0 79[3]

Pearson's correlation coefficient 2-tailed significance
$p<$, [3] 0 0005

Table 29 shows the relationship between the coping variables. There is a positive significant correlation between problem-focused coping and emotion-focused coping, but there is no relation-

ship between the two strategies and avoidance coping.

In the early coping literature (Folkman & Lazarus, 1980) (29) there was a tendency to look upon problem-focused coping as antagonistic to emotional-focused coping. This point of view is actually confirmed in some recent studies (Roger et al. 1993 (30), Elklit, 1996c (27)) In this study we found a concurrent appearance of the two above-mentioned strategies. The reason for this might be that most people cope with a traumatic situation by the appliance of many strategies, among them also a social-coping strategy, which can be seen in Table 29.

The degree of avoidance coping is positively correlated with social-emotional coping strategies and social-disengaging strategies, but not with social-instrumental strategies.

The social-coping strategies are interrelated in this way, insofar as the instrumental and emotional types are highly correlated; the same is the case for the emotional and disengaging types.

The various strategies of coping are positively and highly correlated with the two components of degree of traumatization: Intrusion and avoidance and the IES-total, but generally not with feeling of safety at work, satisfaction with the place of work and changes in outlook on life (cf. Table 30). The only exception is the use of social instrumental strategy, which is associated with a low level of satisfaction with the workplace.

A high level of intrusive images from the explosion turns up in a low level of feeling of safety at work, while a high degree of avoidance is connected with a low degree of social support after

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Table 29 Relationship between coping strategies and between coping strategies and social support

	EMCOP	AVCOP	SOC COP 1	SOC COP 2	SOC COP 3	SOC.SUP THEN	SOC.SUP NOW
RATCOP	0.42[3]	0 10	0 56[3]	0 56[3]	0 09	0 19[1]	0 18[1]
EMCOP		0 05	0 81[3]	0 71[3]	0 01	0.21	0.12
AVCOP			0 01	0 25[3]	0 59[3]	−0 17	−0 00
SOCCOP 1 social-instrumental cop	0 82[3]	0.06	0 27[3]	0 16[1]			
SOCCOP 1 social-emotional cop					0 42[3]	0 14[1]	0.03
SOCCOP 3 social-disengaging cop						−0 23[2]	−0 23[2]
SOC SUPTHEN							0.63[3]

Pearson correlation coefficient 2-tailed significance $p<$ [1] 0 05, [2] 0 005, [3] 0 0005

Table 30 Relationship between coping variables, IES, social support and outcome variables

	INVASION	AVOIDANCE	IES TOTAL	SAFETY	SATIFAC WORK	OUTLOOK
RATCOP	0 29[3]	0 26[3]	0 30[3]	−0 02	0 01	−0.05
EMCOP	0 39[3]	0 28[3]	0 36[3]	−0 08	−0.09	−0.11
AVCOP	0.17[1]	0 47[3]	0 31[3]	−0 02	−0 04	0.09
SOCCOP 1	0 44[3]	0 29[3]	0 43[3]	−0 02	−0.15[1]	−0.07
SOCCOP 2	0 47[3]	0 47[3]	0 50[3]	−0 16	−0 06	−0 03
SOCCOP 3	0 24[3]	0 31[3]	0 31[3]	−0 01	−0 04	0 01
SOCTHEN	−0 01	−0 18[1]	−0 06	0 12	0 03	−0.09
SOCNOW	−0.10	−0 14	−0 13	0 09	0 09	−0 07
SAFETY	−0 23[3]	−0 10	−0 22[2]			
SATISFWORK	−0 12	−0 16[1]	−0 17[1]	−0 43[3]		
OUTLOOK	0 04	−0 03	0 01	−0 10	−0 12	

Pearson correlation coefficient 2-tailed significance $p<$, [1] 0.05, [2] 0 005, [3] 0 005

the explosion and a low level of satisfaction with the place of work six months later.

Feelings of safety at work and satisfaction with the place of work are positively and significantly correlated, which is to be expected.

Discussion

The Odense Steel Shipyard has approx. 3000 employees and is the largest place of work on the island of Funen. The *ethos* of the shipyard employees can perhaps be described in the following way: They are proud, but quiet, people and convinced that they are the best shipbuilders in the world within the area of carriers and super-tankers. The average duration of years of labor at the shipyard is high and the satisfaction with the company is high. Many workers identify strongly with the company, who "reward" their loyalty in many ways through inexpensive housing and training, high standards of security – the shipyard received an award only one week before the explosion – and through cultural and social activities.

The adverse effects of *age* on disaster response in this study are in accordance with several studies, i.e., victims of a ferry disaster (Elklit, 1995) (31),

rescue workers (Taylor & Frazer, 1982) (32), survivors from an explosion at sea (Leopold & Dillon, 1963) (8). The latter found that age was a more powerful indicator of psychological impairment trauma than any other demographic variable. Other studies though have found age to be irrelevant to disaster response (Huerta & Horten, 1978 (33); Ollendick & Hoffman, 1982 (34); Weisæth, 1984) (15) or that older survivors were less affected than younger ones (Bolin, 1982) (35).

It is generally recognized that there are additional stresses of being elderly, which would lead to more psychopathology after a trauma, but on the other hand, older people are likely to have more experience in coping, which would point to less pathology. Also, older persons might have more limited ambitions and a reduced perspective of the future

Studies of flood victims (Price, 1978) (36) and victims of violence (Elklit, 1993a) (37) indicate that it might be beneficial to study the distress produced by a traumatic event on different age groups.

This study found that the middle range of victims, aged 30–45, were more affected regarding blame and guilt feelings. One might speculate that this re-

sult reflects a higher level of responsibility based on higher expectations from self and others due to a combination of experience and physical ability, where the ambitions of the young and older age groups may be more limited. One might also view the effects on the mid-range group as the result of their future being more seriously impaired than that of young individuals who might easily start a new life elsewhere, and that of the older individuals who may resign more easily (Gleser et al. (1981) (38). As mentioned in relation to Table 24, the degree of intrusive images is higher in the middle age group and this might be the main responsible factor in explaining age differences in after effects.

The negative effect of the explosion on the *women* in this study is in accordance with many other studies (Fritz & Marks, 1954 (39); Strumpfer, 1970 (40); Weisæth, 1984 (15); Elklit, 1995) (31). Some studies have found that men and women react differently, i.e., men more typically with alcohol abuse and women more typically with anxiety or depression (Gleser et al., 1981 (38); Solomon et al. 1987a) (41). The Solomon et al. study (1987b) (42) together with Kessler & McLeod, (1984) (43) and Brackstone & Zingle (1993) (44) strongly suggest that traumatic events usually place a heavier load of social demands on women compared to men. The women will be expected to give social support to their spouse and other next-of-kin, but will often receive much less social support themselves. This unbalanced situation may be responsible for some of the findings of female vulnerability.

Cohabiting or marriage is a demographic variable that *per se* has a minimal influence on adaptation. The same result appeared in a study of a ferry disaster (Elklit, 1995) (31). In contrast with popular theory, marriage does not seem to have an effective protection against distress (cf. Cobb, 1976 (45); Lin et al. 1979) (46).

Many studies on stress have been based on retrospective accounts of the number of *life events* experienced. Kasl (1983) (47) mentions the many confounding aspects contained in this type of scales, such as memory, age, mood and life-style. All of these aspects affect responses. In addition, due to the correlational nature of the studies, complex interactions between life events and personality are not discernible. Kasl (1983) (47) suggests natural experiments as a better means of studying the effects of stress. Disaster research is almost always lacking in baseline data, but still it provides a necessary supplement to other stress research.

In this study serious self-reported life events within the last year and former experience of work accidents were strongly associated with distress and certain coping strategies, but interestingly

there seemed to be two quite distinct profiles connected with two types of situations. Life events were distinguished by problem-focused, emotion-focused, and social coping strategies, whereas former accidents showed impairment in processing the trauma, and in the use of avoidance coping strategies (which is also part of the social coping strategy no. 2).

The negative effects of prior serious life events are a very common finding in trauma studies (Elklit, 1993a (37); Elklit, 1995) (31). In this study victims seemed to employ several different ways of coping strategies *and* getting the social support they needed. The workers, who had witnessed or were involved in former work-related accidents, seemed to suffer from intrusive images as well as from avoidant thinking and avoidant behavior. This result might point to a need for more intervention as a means to improve the processing of and coping with accidents.

The positive effects of *training* for the psychological adjustment after an explosion in an industry is well documented in Weisæth (1984) (15). This study confirmed this finding to some degree, since training was not associated with IES-scores with the exception of the 'trained otherwise' category (mostly fire-divers), who had significantly higher invasion scores. Training meant little avoidance coping and much use of rational, emotional, and social coping strategies. Especially for the 'trained otherwise' category, psychological counselling seemed highly necessary as guilt-feelings were abundant In contrast to the Weisæth study we found that those with the training skills highly needed in this disaster situation actually suffered more than those trained in other skills. The *relevance* of the training to the situational demands may be a necessary distinction in future research preferable to the more general concept of training applied by Weisæth.

Workers, who use their special skills in first aid or in the firebrigade, are exposed to mutilated bodies and life-threatening situations. Rescue workers are at an increased risk of developing traumatic symptoms (Durham et al. 1985 (48); McFarlane, 1988 (9); Fullerton et al. 1992) (49). Intrusive thoughts and perceptions seem a very common afterreaction (Wilkinson, 1983 (50); Durham et al., 1985) (48) Anxiety, guilt reactions, and changes in life perspective are also very common (Fullerton et al., 1992 (49); Dyregrov & Mitchell, 1992) (51).

Weisæth (1984) (15) has also demonstrated that high *exposure* is associated with adverse effects. In this study high exposure was very strongly correlated with emotion-focused and social coping strategies, with survivors' guilt, and less strongly, but still very significant, with problem-focused coping.

Interestingly, the degree of exposure was not related to scores on the intrusion or the avoidant subscales.

The level of *anxiety* right after the explosion was conceived as a *process* variable (cf. Fig. 2), which in studies of violent assault is found to be an efficient predictor of outcome (Elklit, 1993a) (37). In this study it was associated with avoidance processing, emotional and social coping plus survivors' guilt. Weisæth (1984) (15) found that a high level of anxiety in the acute post-disaster period was associated with an increased risk of illness.

Physical injury has sometimes been found to be protective against an adverse outcome after a trauma (Adler, 1943 (52); Elklit, 1993a (37)). Weisæth (1984) (15) on the other hand does find an increased illness risk due to physical injury In this study the outcome correlations were quite similar to the effects of the above-mentioned experienced anxiety with high avoidance scores, emotional, and social coping, several talks with the psychologists, but *no survivors' guilt.* The injured person had paid his price at the explosion and did not owe his dead workmates anything.

Weisæth (1984) (15) found that 57 percent of the injured persons after a factory explosion underestimated their injuries, while 29 per cent had exaggerated fears about how severe their injuries were. Only 14 per cent had completely realistic appraisal of their injuries. The common neglect of injuries could be explained from the psychodynamic point of view mentioned above or from a normative, social theory point of view such as 'compared to the dead ones my injuries are nothing' (cf. Taylor et al. 1983) (53).

Knowing the dead might have the effect of more psychological sequelae as the dead may represent a 'significant other'. Thus, a feeling of loss is likely, which may in turn elicit grief reactions and a sense of vulnerability to death (cf. Weisæth, 1984) (15). Knowing the dead in this study meant receiving more support and intervention, more contact with survivors *and* more survivors' guilt.

Seeing the dead, some of whom were terribly burnt, activated many coping responses, but not avoidance strategies. Seeing the dead was also strongly associated with contact with survivors, more psychological interventions, and guilt feelings.

Emotional reactions are also regarded as process variables. The general negative statement group which might have been considered to be less articulate, seemed to be suffering from high levels of intrusion. The anxious group contacted the psychologist, but workers with other dominating emotional reactions did not receive the same intervention nor did they contact a psychologist.

Family reactions are also considered a process of

intermediate variables. In an industrial disaster the family unit is hit or threatened while the family is apart. Many employees had family members working at the shipyard. They soon knew about the explosion but for hours they did not know if their family had been hit. The same was the case for other family members, who were informed through the radio about the explosion, and who left their work or homes and went to the gate and stood there waiting for news. The results point to an interaction between family reactions and victim reactions. An important relationship between family and victim reactions have been found in studies of violent assault (Elklit, 1993a) (37). The results in this study were of a correlational nature and not truly interactional, but one might speculate whether strong anxiety or depressive reactions in the spouse or in other family members might be a strong impetus for a worker to see the psychologist.

In the original diagnosis of PTSD (APA, 1980) *feelings of guilt* were recognized as one of the criteria. In the DSM-III-revised (APA, 1987) guilt was excluded as a diagnostic feature, but it remains an important feature of responses to trauma. Lifton (1967) (54) describes 'survivors' guilt' as a survivor trying to come to terms with that he/she survived at the cost of somebody else. Guilt can also arise because of actions that cause harm or are not taken. Raphael (1986) (55) has stressed these guilt feelings due to omission and feelings of having let oneself or others down in one way or another.

Feelings of guilt are associated with and may predict more severe and chronic post-traumatic reactions (Joseph et al. 1991 (56); Joseph, Hodgkinson, Yule and Williams, 1993a (57)). According to Rachman's theory of an emotional processing (1980) (58) guilt might be a factor causing difficulty in processing the experience. Weiner's (1986) (59) cognitive theory of emotions states that the perceived causes of an event vary primarily on the dimensions of internality, stability and controllability. Attributions for negative events are thought to be related to the emotion of guilt.

In the Joseph et al. study (1993a) (57), feelings of guilt 30 months after a ferry disaster were quite widespread, ranging from 30–69 percent. Guilt about things the victim failed to do was associated with high invasive scores and was twice as common as guilt about things actually done during the disaster. The latter was associated with high avoidance scores, as were feelings about letting others down. Survivors' guilt was both associated with high invasive and avoidance scores.

In comparison with the ferry disaster, guilt was not a common phenomenon in this study, ranging from 5 to 8 per cent. In the ferry disaster, there was a very chaotic situation, where survivors had

only a few minutes to get out of the capsizing ferry, and every survivor had been active in trying to survive and may also have tried to help some who did not survive. In the case of the shipyard explosion, the disaster was more comparable with a lightening. The strike was immediate and hit a group of workers, whereas other workers were not in a situation threatening their own lives.

Moreover, they were not in a situation where they had to save their lives at the cost of others. Weisæth (1984) (15) found a level of survival guilt very similar to that found in this study, ranging from 3 to 9 per cent according to degree of exposure.

Janoff-Bulman & Wortman (1977) (60) found self-blame to be associated with successful coping. They describe self-blame as a situation, in which the victim takes some responsibility for the course of action, which helps to preserve an illusion of control and the belief in a just and meaningful world.

In this study *blaming others* was somewhat more common than guilt feelings, as one in six reported blaming others. According to the review by Tennen & Affleck (1990) (61), blaming others will often be associated with impaired emotional well-being and physical health In an analysis of industrial accidents, Brewin (1984) (62) found no relationship between otherblaming and outcome. If accidents were due to uncontrollable conditions, and the perceived responsibility for the situation therefore was low, there were more psychological problems. In case the workers (all male) took some responsibility for the accident, their mood was better, they returned faster to work, but it did not influence the number of symptoms.

Other-blaming is the result of a moral evaluation in a situation, where one will not accept an excuse for the course of action, and where there is a perceived intention in the other person. Psychodynamic theory (Philips, 1968) (63) has emphasized a pre-existing psychological dysfunctioning as one reason for other-blaming, a reason that also may account for the impaired outcome after a life-threatening event.

Social psychology has emphasized the interaction between the threatening event and the way the victim perceives the self and the environment. Other-blaming can be regarded as a dysfunctional cognitive style or as a defense to protect self-esteem.

The model offered by Tennen and Affleck (op. cit) differentiates situational factors and personal characteristics. The model suggests that impaired outcome associated with other-blaming is due to social reactions, that is, the social network does not respond in a helpful way because of the other-blaming, *and* the victim's feeling of justice and invulnerability is threatened by the event.

According to the theory of Tennen and Affleck, other-blaming should be accelerated under the following four conditions:

1) The presence of another person, 2) the other person having authority, knowledge and ability to influence the event, 3) a distant and negative relationship between the victim and the other person, 4) the severity of the outcome measured by the values, goals, commitments and life projects of the victim.

Thompson (1985) (64) found that a high degree of other-blaming was associated with a negative outlook on life. This study does not support this finding, cf Table 27.

Other-blaming, that is externalizing responsibility, can from an information-processing perspective be seen as a temporary phenomenon where the victim is 'buying time', until the new and provoking information can be assimilated. At the same time other-blaming will disturb social support and the employment of efficient coping strategies.

Bakan (1966) (65), in contrast to Horowitz (1983) (66) and Epstein (1984) (67), distinguishes between personal theories about the self and theories about the world/other persons. Agency is Bakan's term for self-protection and mastery that can be seen as a personality trait ('autonomy') or as an attributional style. If other-blame is high it might for a short time heighten self esteem, but seen from an agency perspective other-blaming also indicates a low level of self-sufficiency. Therefore a high level of other-blame will indicate self determination problems. Communion is Bakan's term for relatedness and being together with others. If communion is a highly valued state by the victim, other-blame will threaten that value, emphasizing the loneliness of the person.

Thus, in studying other-blaming one should recognise the position of 'the other'. In this study, the others to be blamed were at some distance Tennen and Affleck (op.cit.) suggest that other-blaming probably is a stable phenomenon hereby giving some support to the personality dimension. They suggest that research should distinguish between causality, responsibility and blame, each perhaps having unique effects. Until these effects are better known, it might be reasonable to regard other-blaming as an expression of the victim feeling unfairly treated *and* unable to avoid similar experiences

Previous research has shown that greater *crisis support* received from family and friends is associated with lower psychological distress following a traumatic event (Elklit, 1993a (37); Cobb, 1976 (45), Lin et al. 1979 (46))

Besides practical help, social support may provide the victim with normative information that

enables the person to reassess his or her situation. Discussing one's experience with others may be adaptive, if it allows one to reappraise the causes of disaster-related events as uncontrollable and outside the range of individual responsibility.

Individuals who blame themselves for a traumatic event are less likely to receive social support (Andrews and Brewin, 1990) (68), more likely to withdraw socially, and less likely to apply social coping strategies (Brewin et al. 1989) (69). Joseph, Andrews, Williams and Yule (1992b) (24) suggest that two processes are involved, those of confiding in the sort of people who reinforce guilt feelings, and those who do not confide when it would be beneficial because of guilt feelings. It is only when people do not feel responsible for an event and that it might have happened to anyone, that they perceive sharing the experience widely with others to be appropriate (Brewin et al., 1989) (69).

A traumatic event can disturb the social networks, that would normally support the traumatised person (Shine et al. 1984 (70); Solomon, 1986 (71); Elklit, 1993a (37)). This is perhaps most pronounced, when the trauma involves the loss of a significant other (Holm, 1987) (72). Social support is, however, very often reduced after a short time, which signals to the victim, that by now he/she should have overcome the event (Paap, 1981) (73). The distress of the survivor will sometimes cause people in the network to withdraw (Shine et al., 1984 (70); Bard & Sangrey, 1986 (74)).

Social support has been part of many studies of trauma survivors. A substantial finding is that network size or frequency of interaction are not efficient measures of adaptation. Quality and valence of interaction seems to be a far more predictive measure (Shine et al., 1984 (70); Sarason et al. 1987 (75)).

Very often a general axiom exists, of which networks are basically supportive. But often social networks can constitute a stressor to the individual, because the trauma also represents a threat to the network members. Sometimes network members are distressed to the same degree as the survivor (Elklit, 1993a) (37), which makes it understandable that social support from the network might diminish. There also seems to exist unspoken, but all the same quite strong social norms as to what constitutes a proper duration of trauma for reactions (Paap, 1981 (73); Elklit, 1996a (25)).

Various segments of the victim's social network may offer different types of support. Vaux (1988) (76) distinguishes between information, emotional, normative and practical help. Type of support and network source must also be matched (Barling et al. 1987) (77).

Emotional support seems most appreciated when coming from family and friends. Information may be most valued when it is given by experts or co-victims (Shine et al., 1984 (70); Dunkel-Schetter, 1984 (78); Thoits, 1982 (79)).

Timing of support is also critical. Victims need time to absorb and process the trauma and information or advice that with regard to the future, may be experienced as a sign of disrespect and lack of emotional attunement. Most relationships actually seem to have a large amount of unhelpful support besides the helpful part (Porritt, 1979 (80); Dakof & Taylor, 1990 (81)).

In a study of victims of violent assault (Elklit, 1993a; (37) 1993b (82)), ambivalence was found to be the dominant feature in the social support from family and friends, whereas the social support received from the place of work was much less ambivalent.

The relationships between social support and coping strategies are still unclear (Lazarus, 1993) (83). Wortman (1984) (84) suggests that support might influence cognitive reappraisal, e.g., assist in finding a meaning in the traumatic event. Support can also aid in problem-solving and perhaps reduce avoidance behavior. Support might also enhance mood.

Cohen & Wills (1985) (85) discuss the explanatory effects of a buffer model and a direct model of social support. Reviewing a lot of studies they conclude that a buffer model is a good description, when perceived availability is measured, whereas a direct effect model is relevant, when integration in the social network is measured. They also advocate social support as a causal factor in an adaptation process, but wisely mention the possibility that 'proxy' variables may be personality factor like social competence that could influence the social network support and health-promoting activities simultaneously

Sarason et al. (1986) (86) write in the same vein, conceiving social support as both an individual variable and as supplies from the surroundings. One argument for the personality factor point of view is an empirical finding that social support levels are stable for long periods of time. From a developmental psychological perspective (Stern, 1985) (87) the level of care received early in life will be integrated into the personality structure, and form a schemata or a matrix that will influence the person's perceptions, attitudes towards and interactions with other people. Much evidence in psychology (e.g. Epstein, 1993) (88) points to the fact that stability and relatedness to others are fundamental issues, which human beings do a lot to preserve.

McCrae (1984) (89) brings forward the proposition that different kinds of situations might acti-

vate various coping strategies, and in two studies she finds several differences in the application of coping related to a loss, a threat or a challenging situation.

When one compares the two studies carefully, one finds that only two strategies appear to be stable in differentiating loss and threat, the two situations that are most relevant to us. Expressing emotions is significantly and consistently used more often after a loss than after a threat Wishful thinking is significantly and consistently used more often after a threat than after a loss.

Cohen & Hoberman (1983) (90) analyzed four components of social support and found that a number of negative life events *combined* with the level of social support explained the degree of depressive and physical symptoms.

Thus, the combination of many negative life events and low support would lead to a large amount of distressing symptoms. This finding corresponds with the results of Cobb (1976) (45), who investigated many different negative, medical and social life events. The Cohen & Hoberman (1983) (90) study also found that perceived availability and received self-esteem support were very decisive for a positive outcome, whereas tangible help and social integration were less influential.

Wortman & Dunkel-Schetter (1979) (91), (1987) (92) offer a possible explanation for ambivalent reactions in significant others after a victimising event has occurred They suggest, based on evidence from cancer victims, that such events often produce conflicting reactions based on 1) fear and avoidance and 2) beliefs that an appropriate behavior requires an optimistic facade.

Many victims may feel alienated and lonely as a consequence of this behavior that particular time. In a study of victims of a shooting massacre (Elklit, 1996b) (26) this constituted a major problem, especially for those victims who were not in the front line. In a study of cancer patients Dakof & Taylor (1990) (81) further investigated rejection, withdrawal and communication problems in the social network. The social withdrawal turned out to be more the case for friends and acquaintances than for close family members. An important result was that support was found to be dependent on the source. Particular actions were found helpful from some, but not from other network members. The study calls attention to the possible mistake of conceiving and measuring social support as a general, unitary concept.

Coping strategies are supposed to have a causal, mediating role between the traumatizing event and final outcome. According to Lazarus (1993) (83) the coping of the person will change the painful emotions, which were created by the negative

event. Lazarus (*ibid.*) raises the question whether coping is predominantly a personality trait or style or if coping is rather a process variable and an interactional result of a person-environment interplay. The answer to this question is that coping is both. People use many strategies in a distressing situation, and trauma is a complex phenomenon that takes a long time to process.

In contrast with the view presented earlier, Lazarus (*ibid.*) claims that social support regarded as a coping strategy is quite inconsistent across time, and he argues that this is due to its dependency on the social context. Other coping strategies' like e.g., positive reappraisal is relatively constant across time and might be considered more of a personality variable. Lazarus also emphasises that the changeability of the situational conditions are decisive for the choice of coping strategies. That is, problem-focused strategies may be chosen, if the situation can be influenced, and emotion-focused strategies if the situation is refractory to change. The use of rational coping and positive reappraisal will, all things being equal, be connected with a more favorable outcome for the person and result in a more positive emotional state. Confrontation and distancing are associated with a more negative outcome and more distressing emotions. Distancing however, can be an efficient coping mechanism, situations where the individual can do nothing to change the outcome. Wishful thinking has not yet been associated with good adaptation in research, but as Lazarus puts it "there may be situations where it does not cause any harm".

Generally, avoidant coping is associated with impaired adjustment (Holahan & Moos, 1985) (93), but some studies have found no effect of various coping strategies (Wirtz & Harrell, 1987) (94). Lyons (1991) (95) proposes that avoidance strategies may be of value right after the trauma, whereas a continuation of their use will impair a positive adaptation.

In a review of the literature Wortman (1983) (96) concluded, that many studies demonstrate a positive correlation between higher emotional distress and lower self-concept following the trauma and eventual positive adjustment. She argues that traumatization may motivate increased coping efforts and, therefore, be beneficial to the victim.

Once more the aspect of time should be kept in mind, as the variables that predict the onset of distress may not be the same as the variables associated with the development and course of symptoms (Monroe et al. 1986 (97); Creamer et al. 1992 (98)).

Weisæth (1984) (15) found that the most important coping strategy was to reengage in the job and to affiliate with workmates. The two strategies

were inseparable and assessed jointly. Two thirds of the workers who were closest to the explosion center used this strategy as their primary coping strategy. This number increased to four-fifths in the group who was next to the explosion center.

As their second most frequently used coping strategy the workers closest to the center used interpersonal strategies (31 per cent) and engagement in other activities than work (18 per cent). See Table a (Appendix 2).

The workers, who had been least exposed used avoidance and emotional coping together with emphazising the benefits of earlier experiences much more pronounced than did the first and second group.

The medium-exposed workers used positive attention focus strategies (optimism, personal positive contributions) as their preferred second choice coping strategy. The main conclusion from this part of the Weisæth study is the importance of reassuming daily life, e.g., continuing the job and the routines in the company of workmates, who know what happened and how it feels like. The increased need to be with others after a disaster is also noted by Tyhurst (1951) (99).

An additional conclusion is that the degree of exposure affects people's choice of various coping strategies. The findings of this study corroborate those of Weisæth's that avoidance coping is more pronounced and social support more scarce in the group less close to the center.

People who are suddenly confronted with death may change their *attitude to life* as a result of this confrontation. Raphael et al. (1983) (100) studied rescue workers, who were engaged in a railway catastrophe and found that many workers re-evaluated their lives, placed more importance on personal relationships and were less interested in material belongings as a consequence. The same findings were seen in rescue workers involved in a disaster, where a hotel suddenly crashed (Miles et al. 1984) (101) and in survivors and bereaved after a ferry disaster (Joseph et al. 1993b (102); Elklit & Andersen, 1994 (28))

Although this study expanded on prior research, it is also limited in several respects. The study is a retrospective study that might be distorted by memory biases. On the other hand it is a well-known fact within disaster psychology that the traumatic event is remembered vividly and with many details that are easily recalled even many years after the event.

The workers as a whole represented a rather homogenous group of people, who economically, socially and occupationally were well adapted. This should be borne in mind when generalising to other groups of workers.

The stability, paternalistic attitude, and success of the shipyard serve as protective factors for many employees and foster a loyal attitude, which e g., is shown in the response rate almost reaching 100 per cent. The internal consistency of the various scales indicates a generally high reliability.

Studies are needed to investigate long-term physical, psychological and social adaptation in relation to work accidents encompassing health and work data, and more standardized questionnaires on psychological functioning and social relations. Work accidents constitute a common phenomenon that cost the individual, the company and the society at large a great deal. Therefore, the psychological sequelae deserve more attention in the future.

In conclusion, the study confirms the general expectations concerning the demographic factors and the stressor variables with the exceptions of 'being injured' and the degree of exposure due to working in the explosion area. The training and actual rescue effort gave another picture than the one found in the Weisæth study with a higher degree of psycho-social problems. The workers' own words when describing their families' and their own feelings appeared to be indicative of interventional needs. Other feelings like guilt and blaming others were associated with more symptoms in the expected direction. The same was the case for life events and former accidents

Feeling of safety and satisfaction with the place of work and the crisis management on the company's part were not associated with the level of symptoms. Summing up, many general hypotheses were confirmed, but the adverse effects of high level of exposure and the positive effects of training were not unequivocally confirmed. The level of intrusion and avoidance responses points to the strong buffering effects of the high level of social integration at this particular place of work. Many former accidents and the present one do not seem to affect the working relationships adversely nor destroy the confidence in the management of the company.

Acknowledgements

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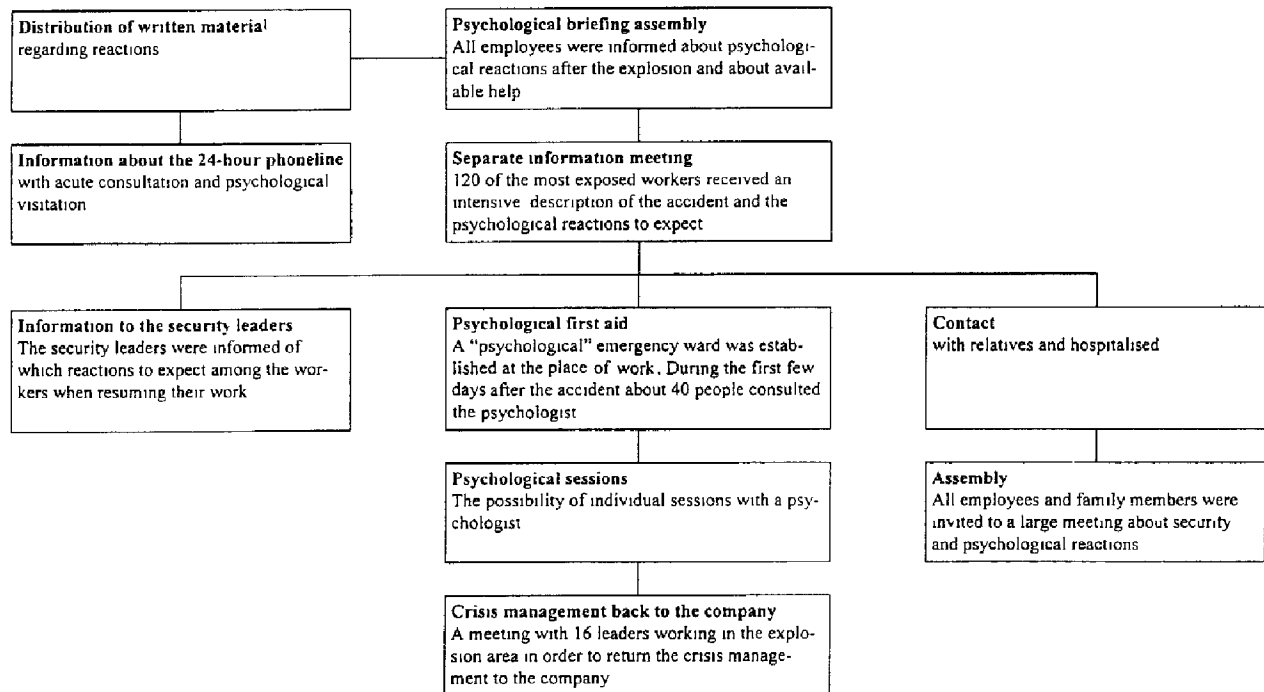3 GRAVERSEN G Arbejdets betydning, kvalitet og udformning. København: Akademisk Forlag, 1992.

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Appendix 1

Falck's Psychological Crisis Aid
Lindø, 27th October 1994

Distribution of written material
regarding reactions

Psychological briefing assembly
All employees were informed about psychological reactions after the explosion and about available help

Information about the 24-hour phoneline
with acute consultation and psychological visitation

Separate information meeting
120 of the most exposed workers received an intensive description of the accident and the psychological reactions to expect

Information to the security leaders
The security leaders were informed of which reactions to expect among the workers when resuming their work

Psychological first aid
A "psychological" emergency ward was established at the place of work. During the first few days after the accident about 40 people consulted the psychologist

Contact
with relatives and hospitalised

Psychological sessions
The possibility of individual sessions with a psychologist

Assembly
All employees and family members were invited to a large meeting about security and psychological reactions

Crisis management back to the company
A meeting with 16 leaders working in the explosion area in order to return the crisis management to the company

Appendix 2

Table a. 2nd choice coping strategy used by workgroups in Weisæth (1984) (15)[1]

	A[2]	B	C[3]
Engagement in (other) activities (than work)	18	10	14
Denial/avoidance	12	18	21
Positive focus	2	26	8
Emotional control	14	15	22
Interpersonal	31	18	4
Earlier experiences	8	3	19
Other	14	10	12
Total	99	100	100

Number in percentages
1) Constructed on the basis of his Table 44, p 245
2) Closest to the center of the explosion
3) Furthest away from the center of the explosion