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The Appraisal of Information Material on Disaster Preparedness

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0 Abstract

Once disaster management requires active involvement of residents, risk information/communication/education become vital. However, mere distribution of material is not enough - it is crucial that communication efforts are effective. This requires socio-psychological expertise and critical effectiveness evaluation. Within pertinent campaigns, various means are used for enhancing disaster preparedness, including leaflets/brochures, picture series (graphs, slides, posters) and videos; altogether printed material is prevailing.

In a project on disaster preparedness programs, materials used by fire authorities in bushfire information/education were studied, focusing on two research issues: Which are relevant criteria for risk communication? Which factors determine whether residents evaluate information material as useful? Main aspects include: length and complexity of texts; use of color, pictures/graphs/drawings, provision of checklists/agendas. Data were collected via surveys with residents, focus-group discussions, and expert appraisals of materials.

Results available so far indicate: Short one-issue leaflets and broad/comprehensive booklets are useful in different contexts; the use of (color) illustrations is expected, yet they seem more significant for attracting attention than enhancing understanding; 'fill-in-yourself' sections are appreciated but not much utilized.

Future investigations should pay increased attention to newer means, such as videos or CD-ROM's and explore the feasibility and efficiency of improving disaster preparedness via InterNet use.

1 Research aims

Wherever humans face the risk of environmental disasters, hazard management becomes a very important task. In Australia, natural fire hazards are particularly salient. Bushfires can be seen as a genuine part of the Australian ecology (Pyne 1991), yet bushfire disasters have claimed hundreds of lives and assets worth billions of dollars. In spite of major advances in bushfire control the risk remains very real. People exposed to hazards need to be optimally informed about their risk and preventative measures. Authorities have to compose pertinent planning and communicate relevant information to residents and communities at large (Barham 1986, Canter 1985). The more disaster management requires active involvement of residents, the more vital risk information/communication/education become (Covello et al. 1989, Fischhoff et al 1997). However, mere distribution of material is not enough - it is crucial that communication efforts are effective. This requires socio-psychological expertise and critical effectiveness

evaluation. Within pertinent campaigns, various means are used for enhancing disaster preparedness, including leaflets/brochures, picture series (graphs, slides, posters) and videos; altogether printed material is prevailing.

How efficient is the use of such materials? Which features are essential? Is the disaster preparedness of people at risk improved? To answer such questions, empirical evaluation research is indispensable (Gaul 1997, Rohrman 1992) - yet pertinent empirical studies are still rare (Lange 1998, Sims et al. 1989). In this context, it seemed highly relevant to investigate current programs conducted in communities at risk. The project "*Improving disaster preparedness through effective risk communication*" {IDP} focuses on fire disasters, in particular the materials used by authorities in bushfire information/education programs for residents. The research aim is to clarify two issues:

- Which are relevant criteria for risk communication (RC) regarding hazards such as fires?
- Which factors determine whether residents evaluate information material as useful?

Findings are then to be utilized for enhanced community campaigns.

2 Conceptual framework

As groundwork for empirical studies, two theoretical issues had to be addressed first: to explicate a conceptual model for (bushfire) risk communication, and to choose criteria for assessing pertinent materials and processes. The outcomes are shown in *fig. 1* and *table 1.*

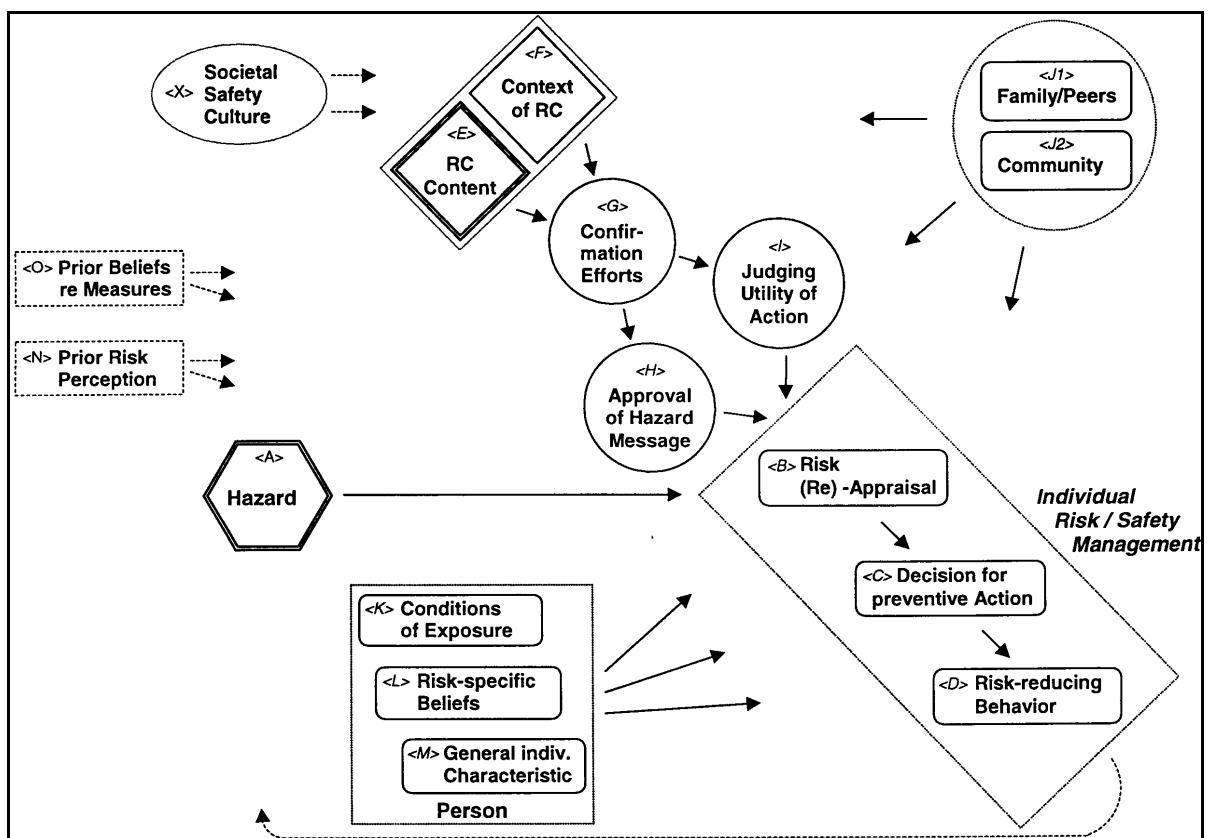


Figure 1: FIRE RISK COMMUNICATION: PROCESS FRAMEWORK

The model expresses that the impact of risk information <E> on the final outcome variable, risk-reducing behavior <D> regarding a hazard <A> (here: bushfires), is embedded in a complex process with many factors to be considered. This conceptual framework (cf. Rohrmann 1995, 1999) guided the specification of evaluative criteria and the design of instruments for empirical investigations on hazard information and preparedness programs.

The explication of criteria is at the core of *evaluation research* (i.e., the scientific assessment of the content, process and outcomes of an intervention (here: RC program) and their assessment according to the stated goals (Fink 1993, Patton 1997; see Rohrmann 1992 with respect to RC). The overall criterion "effectiveness" has to be explicated by observable characteristics of program materials and strategies. *Table 1* lists main aspects.

Table 1: ASSESSING RISK COMMUNICATION EFFECTIVENESS

Type of criteria and examples

Content evaluation

e.g., correctness & completeness of information, comprehensibility, usefulness of graphs/pictures/drawings, concordance with information needs, feasibility of proposed activities

Process evaluation

e.g., difficulties/failures in running the program, inclusion of relevant actors/societal groups, feedback and confirmation possibilities, relevant target audiences reached

Outcome evaluation

e.g., reception of materials, increased problem awareness & knowledge, acceptance of messages, change of beliefs, utilization of proposed activities, risk-reducing behavior

Practicality aspects

e.g., ease of storage of the materials, availability of info updates, technical requirements

Pertinent assessors (depending on the evaluation criterion)

A: RC *agency* (authoring the risk communication material or program)

E: hazard and/or risk communication *experts* (independent researchers)

R: information *receivers* or participants of the RC program

Source: adapted from Rohrmann 1999, Box 2

The first set of criteria refers to the question whether the *content* of the message and its presentation is valid for the communication goals; the second set of criteria is related to the *process* of conducting risk communication programs; the third set deals with the actual *outcomes* of campaigns. In addition to substantial (goal-related) criteria, organizational issues deserve attention. For most criteria, data need to be obtained from several sources.

3 Empirical studies

Within the *Project IDP*, the impact of different means of bushfire information and education were investigated in several sub-studies. Only those dealing with printed materials, such as fliers and brochures, are reported here. These include:

Study <1>: Surveys with residents in exposed areas

PURPOSE:

Collecting quantitative data about residents' knowledge/attitudes/evaluations.

DESIGN:

Residents surveyed three times, *before & twice after* a specific risk communication event

MATERIALS:

Two leaflets (one including pictures) and a 30-page brochure; cf materials A, B, C in table 2)

PROCEDURE:

Participants received *one* material between interview (1) and (2) and *all* materials before interview (3). Interviews based on standardized questionnaires; (1) via face-to-face i., (2) and (3) via telephone.

SAMPLE/PARTICIPANTS:

Residents in a bushfire-prone area, N=120; 113, 57 in phases (1), (2), (3).

NOTE:

Phase (1) and (2) conducted in co-op with B. Lange (Postgraduate Diploma project).

Study <2> Focus group discussions

PURPOSE:

To supplement and to enrich the outcomes of the 'quantitative' surveys.

DESIGN:

Residents from bushfire areas participated in 3-hour group discussion, together with 3 experts.

PROCEDURE:

The discussions were directed by a standardized guideline and tape-recorded.

PARTICIPANTS:

Groups of interviewees from study <A> (N=8), i.e., residents who had received printed CFA material.

Study <3> Assessment of print materials

PURPOSE:

To apply relevant RC evaluation criteria to different types of fire preparedness information.

DESIGN/PROCEDURE:

Experts assessed 4 brochures (material A, C, D, E in table 2), based on an assessment instrument.

PARTICIPANTS:

A small group of scientists (psychologists, other academics, risk researchers, fire experts; 3 each).

Study <4> Usefulness of fire information material in community education

PURPOSE:

To learn about the utility of printed materials about bushfire preparedness (in comparison to other information means, e.g., lecturing, videos).

DESIGN/PROCEDURE:

Personal interviews with highly experienced officers from fire authorities. Focus on their utilization and evaluation of brochures in relation to other materials. Use of scales and explorative questions.

PARTICIPANTS:

All CFA facilitators who work with Community Fireguard groups around Melbourne.

The main materials looked at (two leaflets, three brochures), are described in *table 2* below.

Table 2: PRINT MATERIAL INVESTIGATED IN PROJECT IBP (STUDIES 1 & 3)

"A" *Wildfire evacuation - it's your decision*

Topic: Evacuation. Describes factors to consider in the decision to evacuate or not and outlines important steps in planning for evacuation and home preparation.

Length : 2 pages (on one A4 sheet).

Features A black and white flyer, containing text only.

"B" *"Wildfire evacuation - it's your decision"*

Topic: Evacuation. Describes factors to consider in the decision to evacuate or not and outlines important steps in planning for evacuation and home preparation.

Length: 2 pages (one A4 sheet).

Features Flyer with black+white text and 3 pictures in color.

Note: experimental modification of "A".

"C" *"Living in the bush - Bushfire survival plan workbook"*

Topic: Bushfire preparedness in general. Comprehensive overview of issues such as fire behavior, evacuation planning, identifying risks for home/property, protective activities, fire-safe planting, building design, and defending the home in a bushfire.

Length: 30 pages.

Features: Elaborated booklet in matte color print. Large colored headings; each page illustrated with photographs and/or diagrams. Also contains a grid to sketch the house and property, space to list tasks/plans, checklists, phone contacts, references.

"D" *Will you survive? A guide to lowering your risks before and during wildfires*

Topic: Bushfire preparedness in general. Describes factors to consider in a survival plan, common misconceptions, preparatory actions. Also covers fire-fighting equipment.

Length: 8 pages.

Features: Booklet in glossy color print. Main points are accompanied by large hand-drawn illustrations. Full-page photographs on the front and back cover.

"E" *"Bushfire: Recognise the risks"*

Topic: Bushfire preparedness in general. Describes relevant steps to consider in developing a survival plan. Briefly describes bushfire behavior and disputes common misconceptions

Length: 8 pages.

Features: Booklet in glossy color print with photographs (approximately one per page). Contains a checklist for preparedness tasks.

NOTE: All brochures (except "B") provided by CFA, the Victorian Country Fire Authority.

In some of the substudies, brochures were also compared with other means, such as videos.

4 Findings on information material on bushfire preparedness

The *survey with residents* (Study <1>) provided a comprehensive insight into the viewpoints of information receivers. A few quantitative results are listed in *table 3* Clearly the elaborated brochure "C" gets the best evaluations, but the short leaflets are judged positively

as well as stand-alone info on a topic. In fact many residents prefer compact focused materials to multi-issue ones. The addition of color pictures enhances the rating of "B" vs "A" only marginally.

The participants in *focus groups* (Study <2>) expressed mostly similar views. Regarding special features, lists to 'tick' and 'fill-in-yourself' sections are appreciated but not much utilized. The discussion also showed that the information needs of older and newer residents differ considerably. Also, some reference to local circumstances is generally expected.

Table 3: RESIDENTS' APPRAISAL OF BUSHFIRE INFO/BROCHURES (Project IBP-1)

Materials: "A": b&w, 2 pp on 1 sheet, text only; "B": same as "A" plus 3 pictures in color
"C": elaborated booklet, 30 pages, in color print (cf. table 2 for details)

Mean ratings of materials	when judging one material alone				after comparing all three materials			
	A	B	C	Sign.	A	B	C	Sign.
Quality aspect								
Q04 Rated as interesting (scale: 1..5)	3.9	4.0	4.0	n.s.	2.8	3.9	4.4	**(.47)
Q08 Enjoyable to look at (1..5)	3.2	3.3	3.7	(*)	2.1	3.6	4.2	**(.64)
Q05 Easy to understand (1..5)	4.8	4.8	4.7	n.s.	4.2	4.5	4.6	**(.11)
Q06 Relevant to own situation (1..5)	4.2	4.4	4.0	n.s.	3.9	4.1	4.2	n.s.
Q07 Answers questions of concern	4.0	4.0	4.2	n.s.	3.7	3.8	4.4	**(.21)
Q11 Seen as reliable source (1..5)	4.1	4.3	4.5	n.s.	4.0	4.2	4.7	**(.25)
Q24 Overall appraisal (scale: 0..10)	--	--	--		5.4	6.9	7.9	*(.38)

Significance: */** for $p < .05/.01$; ANOVA's (within-effect), $N=120$ or 60 (Eta^2 in brackets).

In study <3>, systematic *expert appraisals* were collected on four brochures of different design; cf. *table 4* for selected results. Again the elaborated high-quality brochure "C" is evaluated best, but several assessors found it too long. Interestingly, drawings (as opposed to photos) were judged quite positively because of their instructive value. (Note that "D", while rated below "E", gets a much better score for the illustrations). Also, the specific usefulness of short leaflets such as "A" is acknowledged by most raters.

A series of *interviews with facilitators* of the "Community Fireguard" program in Victoria (Study <4>) was very instructive because of their specific experiences and the fact that they use various means (discussions, texts, videos, exercises) in conjunction. As listed in *table 5*, to them particular text components - such as lists of essential preparedness steps - are most important, but they are somewhat skeptical regarding 'tick'-lists, reading tips and drawing-grids. Regarding illustration, on overage a 60:40 proportion for text:pictures is suggested. Photographs are seen as vital for attention rather than explanation.

Table 4: EXPERT ASSESSMENT OF BUSHFIRE BROCHURES (*Project IBP-3*)

Materials: "A" b&w leaflet (no pictures); "C" elaborated 30 pp booklet; "D" compact booklet (8 pp), mostly drawings (color); "E" compact booklet (8 pp), many color photos, checklist

		<i>Mean rating for material: "A" "C" "D" "E"</i>			
<i>Quality aspect</i>					
Q04	Rated as interesting (<i>scale: 1..5</i>)	3.3 (4)	4.5 (1)	3.4 (3)	4.3 (2)
Q08	Enjoyable to look at (<i>scale: 1..5</i>)	1.7 (4)	3.6 (2)	2.6 (3)	3.7 (1)
Q05	Easy to understand (<i>scale: 1..5</i>)	3.6 (3)	3.7 (1)	3.6 (3)	4.0 (1)
Q16	Usefulness of pictures/illustrations (<i>1..5</i>)	--	3.6	3.8	1.9
Q20	Length of brochure (<i>less..more = 1..5</i>)	3.5 (4)	2.7 (3)	3.0 (1)	3.1 (2)
Q17	Usefulness of checklist(s) (<i>scale: 1..5</i>)	--	3.7	--	3.5
Q11	Seen as reliable source (<i>scale: 1..5</i>)	4.1 (3)	4.6 (1)	4.1 (3)	4.2 (2)
Q24	Overall appraisal (<i>scale: 0..10</i>)	5.4 (4)	7.9 (1)	6.2 (3)	6.7 (2)

(Rank order given in brackets).

Table 5: IMPORTANT FEATURES OF BROCHURES: VIEWS OF OFFICERS <Project IBP-4>

<i>Importance ratings (1..5 = not..very):</i>			
Illustrations (photos, drawings, graphs)	4.3	Lists of essential activities & steps	4.5
Lists of necessary equipment	4.1	Checklists (to be ticked)	4.0
Space/grid for drawing a ground plan	2.8	List of references & pertinent literature	3.6
Glossary of technical terminology	3.4	Contact addresses + phone numbers	4.3

NOTE: Based on interviews with all facilitators of the CFA Community Fireguard program

For a more comprehensive report on studies <1> to <4>, cf. Rohrmann in prep..

5 Conclusions for research and application

Altogether the investigated materials received quite favorable evaluations. Their usefulness is dependent on the quality of the wider risk communication process though (cf. fig 1). Whether short one-issue leaflets or comprehensive booklets are preferred depends on the utilization context. As the use of (color) illustrations is expected but their educational value somewhat ambiguous, professional drawings deserve serious consideration.

Finally, while print material is reasonably well researched, future investigations should pay increased attention to newer means such as videos or CD-ROM's and explore the feasibility and efficiency of improving disaster preparedness via InterNet/WWW use.

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