

**Communication of Risk: A community resilience
perspective**

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ABSTRACT

While all disasters create extensive physical loss and destruction with consequent social and psychological disruption, some people and communities cope with, adapt to and recover from disaster consequences better than others. That is, some people and groups are more resilient than others. The importance of understanding resilience extends beyond minimising the loss and suffering of affected populations. It also becomes important in a context in which the risk faced by society is constantly increasing. This review of community resilience research shows that there are a number of individual, community and societal/institutional factors that can influence resilience, and these can be represented as an overall model of resilience. These factors need to be considered and accounted for when developing effective risk communication strategies. These communication strategies should include a variety of activities (e.g., effective messaging, community meetings, scenario-building, school and work activities, drills and exercises, training, etc.) to target and build on different resilience factors and to account for the differing stages of readiness of members of the public.

KEYWORDS

Disaster, adaption, recovery, resilience, community, risk communication, readiness.

1.0 INTRODUCTION

While all disasters create extensive physical loss and destruction, with consequent social and psychological disruption, some people and communities cope with, adapt to and recover from disaster consequences better than others. That is, some people and groups are more resilient than others. The need to understand resilience becomes more critical in a context of increasing societal risk.

Even if the occurrence of hazard events remains relatively constant, factors such as population growth and social development increase risk. The changes within and interactions between the social, built and physical environments produce growing and complex risks. These dynamics are marked in areas of greater population density, when there are more people living in high risk hazard areas.

In this context, the cost of disaster response will become increasingly uneconomic. This fuels the need for Disaster Risk Reduction (DRR) to reduce the social and economic exposure of society, and to increase the likelihood that affected members of societies can respond and recover using their own resources as far as possible. A key element of any DRR strategy will include developing social resilience.

To achieve this DRR goal, it is important to identify a) those factors that contribute to people, individually and collectively, being able to cope with, adapt to, and recover from the dynamic challenges posed by a specific hazard event, and b) the personal, family, community and societal factors and characteristics that influence the degree to which people can develop and use resources that contribute to their resilience. Given natural hazards are infrequent events and their consequences are complex, it is important that people understand the risk and know how to become more resilient. In any resilience-building strategy, effective risk communication will be key to advising people about risk and facilitating the development of social resilience.

2.0 COMMUNICATION OF RISK: A COMMUNITY RESILIENCE PERSPECTIVE

Community resilience research can inform effective communication strategies. A community resilience approach can also address issues that are wider than 'risk communication' alone for example, getting people empowered and participating in activities helps build resilience. As an example, a study was undertaken in Hawke's Bay reviewing risk communication and resilience overall (Becker et al., 2013). It found that the traditional risk communication approach employed by the region went some way to developing attributes of a resilient society – primarily developing individual attributes that contribute to resilience (e.g., self-efficacy, critical awareness, outcome expectancy, etc.). However, the traditional risk communication approach was not particularly effective in developing community/societal attributes related to resilience (e.g., empowerment, participation, trust, etc.). It was suggested that a holistic approach to community resilience should be taken, incorporating both aspects of risk communication and broader community development concepts. The following text has been updated from Becker et al., (2013) and outlines what resilience means, what makes up resilience, how resilience can be developed in communities and how communication strategies can be incorporated into an overall resilience approach.

3.0 WHAT IS MEANT BY RESILIENCE?

Researchers have come to predominantly describe resilience as an ‘adaptive capacity’ held by individuals or communities (Berkes, 2007; De Terte, Becker, & Stephens, 2009; Klein, Nicholls, & Thomalla, 2003; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008; Paton, 2007a). Paton (2007a, p. 7) describes ‘adaptive capacity’ as society’s “capability to draw upon its individual, collective and institutional resources and competencies to [anticipate,] cope with, adapt to, [recover from] and develop from the demands, challenges and changes encountered before, during and after disaster”.

The concept of resilience is broad, and a range of individual, societal and institutional inputs is required to create a resilient society. Thus, while being physically and mentally prepared for a disaster forms one part of resilience (i.e., ‘preparedness’), it will not solely create a resilient society. Likewise, while communications about being prepared and resilient are important, in isolation it will not ensure a resilient society (Becker et al., 2011). Developing a resilient society requires taking a more comprehensive view.

In this context, resilience can be defined as comprising four interrelated components that form a ‘model’ of resilience (Paton & Johnston, 2006). Firstly, communities, their members, their businesses and their societal institutions must possess the resources (e.g., household emergency plans and supplies, business continuity plans, social resources) required to ensure, as far as possible, their safety and the continuity of core functions in a context defined by disruption from hazards consequences (e.g., ground shaking, volcanic ash fall, flood inundation) that can disrupt societal functions. Secondly, they must possess the competencies (e.g., self-efficacy, community competence, trained staff, disaster management procedures) required to mobilize, organize and use these resources to confront the problems encountered and adapt to the reality created by hazard activity. Thirdly, the planning and development strategies used to facilitate resilience must include mechanisms designed to integrate the resources available at each level to ensure the existence of a coherent societal capacity, and one capable of realising the potential to capitalize on opportunities for change, growth and the enhancement of quality of life. Finally, strategies adopted must be designed to ensure the sustained availability of these resources and the competencies required to use them over time and against a background of hazard quiescence and changing community membership, needs, goals and functions.

It is, therefore, important to understand how interdependencies between people, their communities, and societal institutions and organisations influence adaptive capacity. That is, it is necessary to describe resilience, or adaptive capacity, at several, interdependent, levels. For example, the ability of a community to adapt to adverse or challenging circumstances and recover using its own resources requires that attention be directed to safeguarding the physical integrity of the built environment (e.g., land use planning, design standards, building codes, lifeline engineering, retrofitting buildings).

The benefits of enhancing community resilience include increased self-reliance during disaster response and recovery, decreases in recovery time, better community response to warnings, lower casualty numbers, reduced damage, increased business survival, reduction of psychosocial problems, and reduction of overall economic costs (Becker et al., 2011).

The effectiveness of resilience strategies can only be determined in the context of responding to an actual disaster. To this end, the model presented in this report was developed, tested and validated in the context of the Christchurch earthquake sequence. It has also been tested and validated across a range of hazards and cultures (Paton, 2013; Paton et al., 2013). The model draws on the analysis of survivor's accounts of what contributed to their resilience and the factors that influenced how well they were able to cope and adapt. It identifies the factors that enhance post-disaster outcomes for individuals or communities (Paton et al., 2014).

The unprecedented level of theoretical rigour underpinning such a model of resilience strengthens the generalizability of this report across hazards (i.e., it informs an all-hazards approach) and its ability to inform intervention planning and delivery in ways that accommodate cultural diversity in New Zealand. The following sections discuss some of the specific factors that have been found to contribute to building resilience in communities, and thus are part of the aforementioned model of resilience.

4.0 FACTORS OF RESILIENCE

A significant amount of research has been undertaken to identify the adaptive capacities or resilience predictors that help account for differences in levels of personal, community and societal resilience. The factors identified as being important in helping develop resilience are described below.

4.1 SELF-EFFICACY

“I can do something to mitigate the effects of a disaster” (Becker et al., 2011)

Self-efficacy is an individual's belief that they can do something to control the outcome of a disaster. People with a higher level of self-efficacy are more likely to prepare for disasters and believe that they will be able to respond effectively in a disaster situation (Becker, 2012; Cowan, McClure, & Wilson, 2002; Duval & Mulilis, 1999; Lindell & Prater, 2002; Lindell & Whitney, 2000; McClure, Allen, & Walkey, 2001; McClure, Sutton, & Sibley, 2007; McClure, Sutton, & Wilson, 2007; McClure, Walkey, & Allen, 1999; Mulilis & Duval, 1995; Rüstemli & Karanci, 1999; Şakioroğlu & Karanci, 2008). Self-efficacy is linked closely with outcome expectancy (Paton, 2003, 2007a; Paton, Smith, & Johnston, 2005). It also links with community participation, as it has been found that those involved in general community activities have higher levels of self-efficacy indicating that participation helps build self-efficacy (Bishop, Paton, Syme, & Hancarrow, 2000; Lindell & Whitney, 2000; Paton, Smith, & Johnston, 2000).

4.2 COLLECTIVE EFFICACY

“Together we can do something to mitigate the effects of a disaster” (Becker et al., 2011)

Collective efficacy or the belief that collectively a community can do something to control the outcome of an disaster has also been shown to influence preparedness by building a feeling of empowerment and encouraging community members to take action (Mclvor, Paton, & Johnston, 2009; Paton, 2007b; Paton, Bajek, Okada, & Mclvor, 2010; Paton, Frandsen, & Tedim, 2011; Paton et al., 2008; Paton et al., 2009; Paton et al., 2010). Collective efficacy is itself influenced by self-efficacy (Paton, Bajek et al., 2010).

4.3 OUTCOME EXPECTANCY

Outcome expectancy, the perception of whether undertaking a specific action will actually mitigate the threat from a disaster influences whether or not individuals prepare for a disaster or not. It is also referred to as response efficacy. (Davis, 1989; Farley, Barlow, Finkelstein, & Riley, 1993; Garcia, 1989; Lindell & Whitney, 2000; Mclvor & Paton, 2007; Mclvor et al., 2009; Mulilis & Duval, 1995; Mulilis & Lippa, 1990; Paton, 2003; Paton, Bajek et al., 2010; Paton & Johnston, 2008; Paton, Sagala et al., 2010; Paton et al., 2005; Paton, Smith, Johnston, Johnston, & Ronan, 2003; Şakioroğlu & Karanci, 2008). People who hold a positive outcome expectancy (i.e., *“I can deal with hazards and as a result there will be a good outcome”*) are more likely to undertake preparedness actions than those who hold a negative outcome expectancy (i.e., *“Whatever I do I can't make a difference”*) (Becker et al., 2011; Paton, Bajek et al., 2010; Paton & Johnston, 2008; Paton, Sagala et al., 2010). Positive outcome expectancy can be enhanced by encouraging higher levels of discussion and developing people's understanding of hazard issues; by developing people's perceptions

that disaster losses are selective and avoidable (e.g., by undertaking practical preparedness measures), rather than uncontrollable; and by showing that being prepared has a widespread benefit that transcends disasters themselves (Becker et al., 2011; Paton, 2007a). Negative outcome expectancy can be reduced by showing people that damage from an event is not universal and total, and that people can have some control over disasters (Becker et al., 2011).

4.4 CRITICAL AWARENESS

“Hazards are important, and I think and talk about hazards regularly” (Becker et al., 2011)

Critical awareness, or the extent to which people perceive hazards are important enough to think and talk about them regularly with others, has been found in many studies to have an influence on people’s perception of risk from disasters and preparedness (Lindell & Perry, 2011; Lindell & Prater, 2000; Mclvor & Paton, 2007; Mileti & Darlington, 1995, 1997; Mileti & Fitzpatrick, 1992, 1993; Paton, 2003, 2007a; Paton, Kelly, Bürgelt, & Doherty, 2006; Paton, McClure, & Bürgelt, 2006; Paton et al., 2005; Paton et al., 2003). The more frequent the thoughts and discussion, the better people’s understanding of hazards often are (Mclvor & Paton, 2007; Paton, 2003, 2007a; Paton, McClure et al., 2006; Paton et al., 2005), and the more reminders there are about the threat that needs to be addressed (Lindell & Prater, 2000). Discussion, however, can also lead to people not preparing, particularly if the discussion is not directed in a positive way towards preparing (Becker, 2012; Paton, McClure et al., 2006; Paton et al., 2005). Critical awareness can be influenced by people’s attitudes and beliefs, and social norms (Becker et al., 2011).

4.5 ACTION COPING

“I deal with problems by undertaking action directly (rather than worrying)” (Becker et al., 2011)

Problem-focussed coping (i.e., dealing directly with a problem by taking action), rather than emotion-focussed coping (i.e., worrying about a problem), has been found to predict resilient responses to disaster issues (Duval & Mulilis, 1999; Lindell & Prater, 2003; Lindell & Whitney, 2000; Paton, 2003; Paton, Millar, & Johnston, 2001). Action coping is a form of problem-focussed coping and has been found to have an influence on people’s intentions to get prepared for disasters (Mclvor & Paton, 2007; Paton, Kelly et al., 2006; Paton et al., 2003). Self-efficacy can have an influence on the degree of problem-focussed coping that takes place (Bennett & Murphy, 1997).

4.6 LEADERSHIP

Analyses of community resilience following the Victorian bushfires in 2009 and the Canterbury earthquake sequence in 2010-2011 have identified emergent community leadership as an important predictor of resilience and adaptation (Paton, 2012). Leaders were generally those who brought experience of competencies (e.g., planning, problem solving and conflict management) or had specific skills (e.g., building) that provided direction for community members. Leaders also added legitimacy to community groups and provided them with a source that could liaise with government and businesses. This is an under-researched area that needs to be considered in future research.

4.7 COMMUNITY PARTICIPATION

“I actively participate in community activities” (Becker et al., 2011)

Community participation in both hazards and preparedness issues and other community activities has been identified as being a key influence on preparing for disasters (Heller, Alexander, Gatz, Knight, & Rose, 2005; McIvor et al., 2009; Paton, 2008; Paton, Bajek et al., 2010; Paton et al., 2011; Paton, Houghton et al., 2008; Paton et al., 2009; Paton, Parkes, Daly, & Smith, 2008; Paton, Sagala et al., 2010; Paton, Smith, Daly, & Johnston, 2008). Community participation helps people find out new information, learn new skills, connect with others, personally buy-in to issues and problems, be actively involved in solving problems, and build a sense of pride (Becker et al., 2011). It also represents the context in which people formulate their risk beliefs and make decisions about what to do to manage their risk when they have to make decisions under conditions of uncertainty (Earle, 2004; Lion, Meertens, & Bot, 2002; Poortinga & Pidgeon, 2004). Community participation serves as a linking process that integrates the individual level with the community level.

4.8 ARTICULATION OF PROBLEMS

“I discuss and define problems, and help determine solutions for those problems” (Becker et al., 2011)

The articulation of problems has an influence on whether people develop intentions to prepare for hazards (McIvor et al., 2009; Paton, 2007b, 2008; Paton, Bajek et al., 2010; Paton, Sagala et al., 2010; Paton, Smith et al., 2008). The articulation of problems relates to people's ability to discuss and describe community issues and problems, and define solutions to those problems (Becker et al., 2011). In a disaster related context, people need to be able to define the types of problems that might arise in a disaster, and identify solutions to those problems. The articulation of problems links with other factors such as critical awareness, trust, community participation and empowerment (Paton, 2007a). Articulation of problems must be targeted specifically in resilience building programmes, as even though community participation is important in helping articulation take place, participation alone will not automatically lead to a capacity to articulate problems (Paton, 2007a). Articulation of problems plays a pivotal role in determining the quality of interaction between communities and the agencies and institutions they rely on for resources and information. It reflects an ability to define needs and to formulate them as questions that can be directed to others. It is a fundamental characteristic of an empowered community.

4.9 PLANNING

Planning increases the likelihood of people taking action to deal with environmental threats (Schwarzer, 2001). The term 'planning' refers to individuals and communities making plans to respond to emergencies. Resilience is increased when people and communities can develop detailed action plans including the when, where, and how certain goals will be enacted (Paton, Frandsen, & Johnston, 2010).

4.10 PLACE ATTACHMENT

Collective behaviour to deal with environmental hazards can be influenced by people's sense of attachment to place (Jakes, Kruger, Monroe, Nelson, & Sturtevant, 2007; Paton, Bürgelt, & Prior, 2008). Hummon (1992) and Low and Altman (1992) described how place attachment, which reflects the degree of embeddedness of individuals within their social-ecological environments, results in people having an emotional investment in their community and this, in turn, increases motivation to protect that investment. This increases their capacity to co-exist with natural processes and facilitates adaptive capacity through more effective management of environmental risk.

4.11 EMPOWERMENT

"I can call upon personal and external resources, and deal with issues that arise" (Becker et al., 2011)

Empowerment has been found to have a bearing on whether people decide to prepare for disasters (McIvor et al., 2009; Paton, 2007b, 2008; Paton, Bajek et al., 2010; Paton, Sagala et al., 2010; Paton, Smith et al., 2008). Empowerment is described by Paton (2007a, p. 34) as "citizens' capacity to gain mastery over their affairs and to deal with issues and opportunities using intrinsic resources". Empowerment is essential to helping people feel they are capable of preparing for a disaster, and helping feel they are able to respond to a disaster when it occurs. Empowerment is influenced by, or influences, other factors such as critical awareness, outcome expectancy, self-efficacy, sense of community, and response efficacy (Becker et al., 2011). With respect to developing resilience, two elements play complementary roles to influence the prevailing level of empowerment. These are empowered people and empowering settings. Factors such as community participation, collective efficacy, problem articulation and planning competencies describe empowered people and communities. Empowerment reflects the quality of reciprocal relationships between community members and between community members and societal institutions. It thus represents a mechanism that links communities and agencies. Empowerment ensures that people, communities and risk management agencies play complementary roles in risk management. The quality of these relationships will define the degree to which responsibility for action is devolved to community members and will, consequently, influence the level of trust that exists between community members and civic emergency planning agencies.

4.12 TRUST

"I trust individuals, groups and organisations" (Becker et al., 2011)

Having trust in individuals or agencies connected to hazard management is important for motivating people to prepare for disasters (Johnston, Karanci, Arikan, & Nosek, 2006; Karanci & Askit, 1999; Maeda & Miyahara, 2003; McIvor et al., 2009; Paton, 2008; Paton, Bajek et al., 2010; Rüstemli & Karanci, 1999). It is particularly important when people have to make decisions under conditions of uncertainty. It has been found that people are more likely to prepare if they trust the source of the hazard and preparedness information (Paton, 2007a, 2007b; Paton, McClure et al., 2006). Levels of risk acceptance and people's willingness to take responsibility for their own safety is increased, and decisions to take steps to actively manage their risk more likely, if people believe that their relationship with formal agencies is fair and empowering (e.g., agencies are perceived as trustworthy, as acting in the interest of community members) (Lion et al., 2002; Paton & Bishop, 1996; Poortinga & Pidgeon, 2004). When this relationship is not perceived as fair, the consequence is a loss of trust in the

agency (i.e., the source of information). People are also more supportive of agencies managing hazards if they trust the way they manage risk (Paton, McClure et al., 2006). Trust is influenced by a person's prior experiences (both of disasters and dealings with institutions), situational factors, and personal dispositional factors (Paton, 2007a, 2007b).

4.13 SENSE OF COMMUNITY

The research findings about 'sense of community', or feelings of belonging and attachment for people and places, is mixed. Some studies have found a link with 'sense of community' to the disaster preparedness process (Bishop et al., 2000; Paton et al., 2011; Paton, Kelly et al., 2006; Prior & Paton, 2008) and others have found no significant relationship (Paton, Millar et al., 2001; Paton et al., 2005). Such differences in study results may be related to the differing contexts of the studies. Becker (2012) found that the concept of 'sense of community' was linked with community participation, whereby individuals who felt a sense of community were more likely to participate with respect to hazard-related issues. Despite mixed results, it would appear that 'sense of community' does have a part to play in building resilient communities.

4.14 SOCIAL NORMS

Several researchers have found that people may be more likely to prepare if they observe or believe that others have prepared (Farley, 1998; Mileti & Darlington, 1997; Mileti & Fitzpatrick, 1992). This suggests that societal norms have a part to play in disaster preparedness (Solberg, Rossetto, & Joffe, 2010). McIvor and Paton (2007) looked specifically at subjective norms and found that positive subjective norms had an indirect influence on intentions to prepare, mediated by outcome expectancy. Positive subjective norms also linked with having a positive attitude toward preparing. Becker (2012) also found that norms have an influence on the disaster information interpretation and preparedness process, with predominant normative belief being that preparedness was not normal or a widespread activity, hindering preparedness taking place. Becker (2012) suggests that the development of helpful attitudinal and behavioural norms was best influenced by: participating in an interactive group situation or activity; being exposed to frequent information which stimulated critical awareness; active practice of hazards and preparedness activities; learning from an early age about hazards and preparedness; and framing preparedness in a way that makes it more applicable to people's daily lives and current normative beliefs.

4.15 PERSONAL RESPONSIBILITY

Research has found that people who feel a personal responsibility to prepare for disasters are more likely to undertake actual preparedness (Garcia, 1989; Jackson, 1977, 1981; Mulilis & Duval, 1995, 1997; Perry & Lindell, 2008). People who ascribe control of a problem to other institutions, such as local or central government, may be less likely to undertake preparedness actions because they believe the problem is being addressed by those institutions (Ballantyne, Paton, Johnston, Kozuch, & Daly, 2000; Jackson, 1981; Lindell & Whitney, 2000; Paton et al., 2000).

4.16 RESPONSIBILITY FOR OTHERS

Researchers have identified that people who feel of a sense of social responsibility for others may be more motivated to prepare for disasters (Becker, 2012; McIvor et al., 2009), or may be more supportive of mitigation programmes (Flynn, Slovic, Mertz, & Carlisle, 1999). The importance of sense of responsibility can also be observed indirectly in other studies that have found getting prepared linked to having children or dependents in a household (Barata et al., 2004; Dooley, Catalano, Mishra, & Serxner, 1992; Edwards, 1993; Russell, Goltz, & Bourque, 1995; Turner, Nigg, & Heller-Paz, 1986).

4.17 EMOTIONS AND FEELINGS

In terms of feelings, research has found that anxiety in particular can have an influence on the preparedness process. This influence can be either positive or negative depending on the context (Paton et al., 2005; Paton et al., 2003). In some cases anxiety has been found to reduce the likelihood that people will prepare for disasters (McClure, 1998; Paton et al., 2005; Paton et al., 2003), and is often linked with denial and fatalism. In contrast, other studies suggest that anxiety (reflected in worry, fear or concern about future disasters) can directly influence and motivate preparedness (Dooley et al., 1992; Heller et al., 2005; Karanci & Aksit, 2000; Karanci, Aksit, & Dirik, 2005; Kiecolt & Nigg, 1982; Rüstemli & Karanci, 1999; Showalter, 1993; Siegel, Shoaf, Afifi, & Bourque, 2003; Turner, 1983). Paton et al. (2005; 2003) found that different levels of anxiety can create a different response (i.e., very high levels of anxiety may be a hindrance to the preparedness process, while lower levels may be helpful).

4.18 PREVIOUS EXPERIENCE

Previous experience of both disasters and other adverse events has an impact on a wide range of aspects related to resilience including influencing risk perception (e.g., Clark, Veneziano, & Atwood, 1993; Dooley et al., 1992; Jackson & Mukerjee, 1974; Karanci & Askit, 1999; Lindell & Prater, 2000; Palm & Hodgson, 1992); critical awareness (Lindell & Prater, 2000, 2003; Turner et al., 1986); beliefs about hazards and preparedness, e.g., can contribute to normalisation (Mileti & O'Brien, 1992) and optimistic biases (Burger & Palmer, 1992; Helweg-Larsen, 1999); self-efficacy (Mulilis, Duval, & Rogers, 2003), concern and anxiety (Dooley et al., 1992; Heller et al., 2005; Rüstemli & Karanci, 1999; Siegel et al., 2003); and actual preparedness (e.g., Farley, 1998; Lindell & Prater, 2002; Mulilis, Duval, & Lippa, 1990).

4.19 DEMOGRAPHIC CHARACTERISTICS

Demographic characteristics (such as gender, income, education, length of time in neighbourhood, marital status, family-make-up, ethnic make-up) have variable impacts on whether people prepare for disasters, with some particular demographics correlating with preparedness depending on the study (e.g., Armaş, 2006; Dooley et al., 1992; Edwards, 1993; Endo & Nielsen, 1979; Farley et al., 1993; Karanci et al., 2005; Lindell, Arlikatti, & Prater, 2009; Lindell & Prater, 2000; Mileti & Darlington, 1997; Mileti & O'Brien, 1992; Ozdemir & Yilmaz, 2011; Paradise, 2005, 2006; Russell et al., 1995; Tanaka, 2005). Other studies show no influence of measured demographics at all (Asgary & Willis, 1997; Nguyen, Shen, Ershoff, Afifi, & Bourque, 2006; Palm, 1995; Palm, Hodgson, Blanchard, & Lyons., 1990). Because there are no strong correlations between demographics and the preparedness process, these are not actively used in current resilience measurement and

modelling. The differences observed reflect the fact that people differ in the presence or absence of the social and psychological factors discussed earlier. This highlights the importance of assessing and developing social and psychological predictors rather than focusing on demographics. Demographic characteristics do influence tangible factors such as resource availability.

4.20 RESOURCE ISSUES

Resource factors contribute to whether people prepare or not for disasters. For example, the cost of preparedness measures may hinder some people in getting prepared (Blessman et al., 2007; Kunreuther et al., 1978; Mileti & Darlington, 1995; Palm et al., 1990). Cost-benefit issues are also relevant. Even when believing in the benefits of preparing, some people will delay action because they interpret the low frequency of occurrence of hazard events as creating a significant cost benefit imbalance (high immediate costs and no certainty of return on that investment). This type of decision making becomes more likely the further into the future people assume the next event will occur (e.g., a literal interpretation of a 50 year or 100 year event). A lack of time available to undertake preparedness has also been identified as a barrier to action, especially with respect to undertaking more complex actions like making a plan (Blessman et al., 2007; Carter-Pokras, Zambrana, Mora, & Aaby, 2007). At a wider community level, a lack of resources may also limit the effectiveness of getting prepared for a disaster (Johnston et al., 2006; Lindell & Whitney, 2000; Palm & Hodgson, 1992; Paton, 2006).

4.21 PSYCHOLOGICAL PREPAREDNESS AND RESILIENCE

A need for psychological preparedness was evident in accounts of experiences of the Canterbury earthquake sequence in 2010–2011, particularly in relation to dealing with aftershocks and prolonged periods of dealing with physical, social and psychological demands (Paton, 2012). Psychological preparedness is not about eliminating people's vulnerability to adverse emotional and stress reactions. Rather, it is intended to help people understand how and why they react as they do and to assist them to develop the capacities to manage stress over time. It is a function of the degree to which people possess the competencies and capacities (e.g., knowledge, planning/anticipation, recognition, thinking, feeling, decision making and the management of one's own thoughts, feelings and actions) that influence their capacity to comprehend and understand, predict, recognize and manage the emotional correlates of anticipating and facing challenging circumstances. Psychological preparedness can be enhanced through direct and vicarious experience with emergency situations and scenarios. Being better able to anticipate what they may encounter enhances people's ability to predict, respond to and exercise control over challenging circumstances and to manage and recover from the associated stress.

Morrissey and Reser (2003) discuss psychological preparedness as possessing three essential elements. These are: 1) to anticipate the anxiety and concerns that will arise; 2) to identify uncomfortable or distressing thoughts and emotions that may cause further anxiety; and 3) to find ways of managing the responses so that one's coping capacity remains as effective as possible. Procedures such as stress inoculation training and learned resourcefulness represent strategies that could be used to promote psychological preparedness (Meichenbaum, 1986, 2007; Morrissey & Reser, 2003; Morrissey & Reser, 2007; Rosenbaum, 1990). Psychological intervention may be beneficial with regard to managing the anxiety that has been identified as an impediment to people deciding not to prepare (Morrissey & Reser, 2003; Paton et al., 2005).

The need to consider post-event psychological preparedness strategies before an event takes place derives from the fact that people may face exposure to socio-legal processes such as litigation and public inquiries, and media coverage that may persist for months or years. People may benefit from preparation to deal with the blame processes (e.g., self and other blame, counterfactual thinking) that can affect well-being in this context and that can be divisive in community settings. Ascertaining whether this would be beneficial and determining how, when and by whom it should be provided is an issue for future research. Public education and community outreach can examine ways of integrating physical, social and psychological preparedness. The inclusion of psychological preparedness in risk management requires consideration being given to several issues. Prominent issues here include considering the nature of psychological preparedness, its relation to other aspects of preparedness, and expanding the stages in which psychological preparedness needs to be considered to include pre-disaster, disaster and post-event stages.

In addition to seeing psychological preparedness as a separate area for development, it is also pertinent to consider how psychological readiness and other aspects of hazard preparedness can be integrated. The rationale for exploring this possibility lies with the role that predictability and control play in managing stress.

For example, rather than just providing people with information about preparing, explaining the relationship between hazard characteristics, preparedness measures and how and why they are effective could help people develop a greater sense of predictability and control (Paton & Wright, 2008). Engagement-based approaches to community outreach that build relationships between neighbours and community members can assist the development of a sense of collective control, and can facilitate the development of social support (e.g., informational, tangible, emotional, and belongingness support) which can make beneficial contributions to psychological preparedness before, during and after hazard events. Doing so can also contribute to developing a sense of shared (social) responsibility for managing risk.

5.0 A MODEL OF RESILIENCE

Paton and his colleagues have undertaken a significant amount of research to develop a model of resilience that can aid our understanding of what makes up resilience, and how resilience can be measured. (e.g., Paton, 2005, 2006, 2007a; Paton, Bajek et al., 2010; Paton, Johnston, Smith, & Millar, 2001; Paton, McClure et al., 2006; Paton, Millar et al., 2001; Paton, Parkes et al., 2008; Paton et al., 2000).

The research has identified that many of the individual, community and institutional factors described previously can be used as indicators of resilience. These indicators have been developed into an overall model of resilience Figure 5.1. The indicators can be grouped into three broad areas (as summarised in Becker et al., 2011):

1. **Making a difference**, where people need to know that the small things they can do can make a difference for themselves, their families and their neighbours;
2. **Participation and empowerment**, where communities are directly involved in identifying their risks and determining solutions for themselves;
3. **Leadership and trust**, where communities are supported by institutions that encourage community led initiatives and where mutual trust and respect exist.

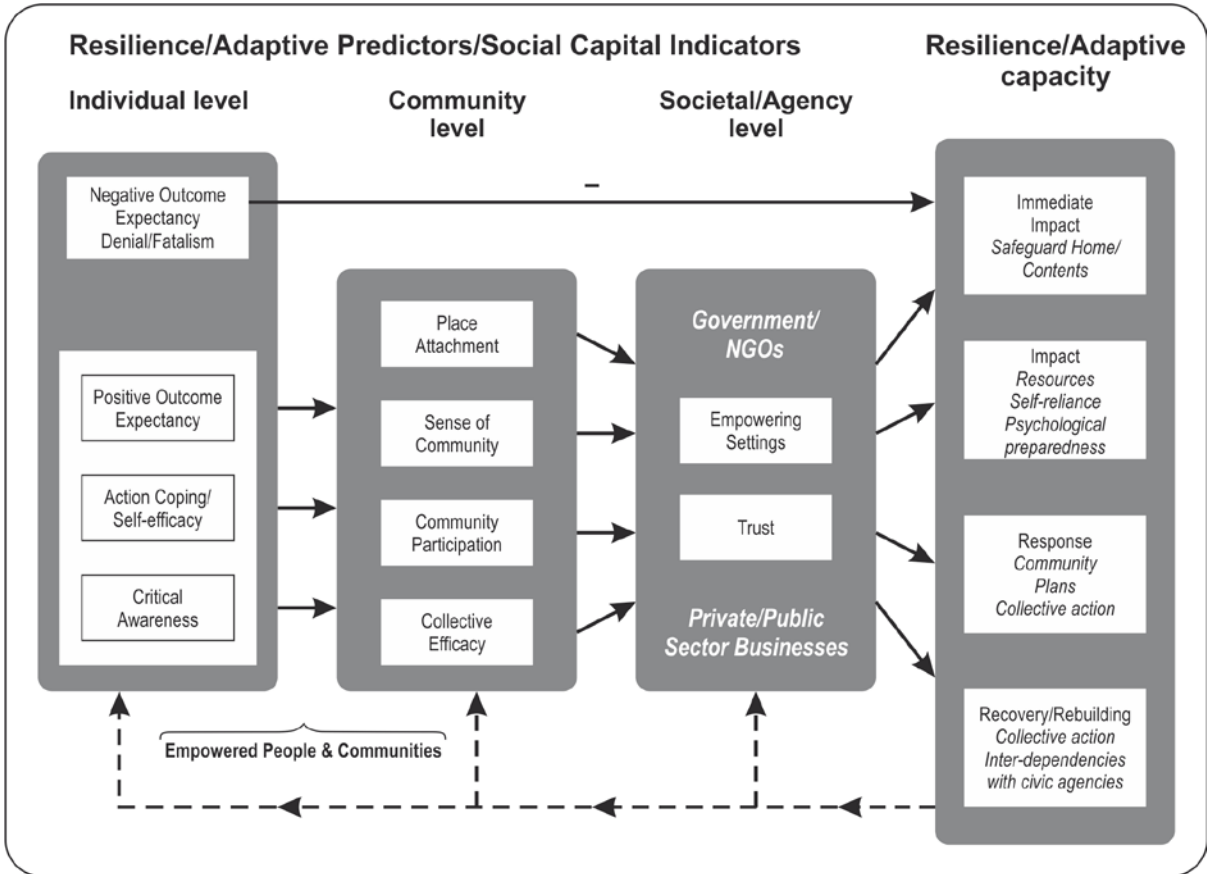


Figure 5.1 A model of community resilience (Paton, 2010).

As well as contributing to the development of an overall model of resilience, many of the factors described in the first section can also be used as on-going measurable indicators of resilience within communities. The analysis of quantitative surveys indicates which are the most critical resilience factors (indicators) for each community, i.e., which of the personal, community and institutional factors are most strongly affecting resilience in that community (Becker et al., 2011). An understanding of the nature and level of current resilience factors in a community enables agencies to direct effort into enhancing factors that may not be present at high levels.

Based on the research by Paton and colleagues listed above, indicators that have the most influence on resilience and that should potentially be measured in an on-going way include (Becker et al., 2011):

- **Individual indicators**
 - Self-efficacy
 - Positive outcome expectancy
 - Negative outcome expectancy
 - Critical awareness
 - Action coping
 - Planning
 - Responsibility
- **Community indicators**
 - Community participation
 - Articulating problems
 - Leadership
 - Collective efficacy
 - Social responsibility
 - Place attachment
- **Institutional indicators**
 - Community empowerment
 - Trust.

It must be noted that the model of resilience is a system, and that there are interdependencies between the factors/indicators (Figure 5.1). Measurement of resilience, and agency interventions to develop resilient factors in communities, must be undertaken holistically with all factors targeted in the both the measurement and development processes (Becker et al., 2011). Long term measurement of the indicators is also advised as intervention programmes will cause resilience to evolve over time, and it is only through measurement of all the indicators that agencies will know which elements of resilience are growing and which need to be further targeted.

6.0 RECOMMENDATIONS FOR BUILDING RESILIENCE

With respect to the factors/indicators, it is recommended that agencies work to develop the resilient factors in their communities in a holistic way. In short, the following areas should be targeted (Becker et al., 2011):

At an individual level, work to:

- Develop people’s problem solving skills (action coping)
- Increase their belief in the benefits of hazard mitigation (develop positive outcome expectancy)
- Increase their belief that what they can personally do will make a difference (reduce negative outcome expectancy)
- Develop people’s belief that they can do something to mitigate the effects of a disaster (self-efficacy) and prompt thought and discussion about disasters (critical awareness), both of which assist in developing other factors.

At a community level, work to:

- Encourage active involvement in community affairs and projects (community participation)
- Develop the community’s ability to resolve collective issues (articulating problems).

At an institutional level, work to:

- Develop an individual’s ability to influence what happens in the community (empowerment)
- Develop the level of trust an individual has in different organisations (trust).

More specific recommendations in developing the various resilient factors are outlined in Table 1.1. This table represents a summary of key suggestions; more detail can be found in Becker et al., (2011).

Table 1.1 Factors or ‘indicators’ of resilience and specific recommendations for developing resilience in communities (adapted from Becker et al., 2011).

Resilient factor/indicator	Recommendation for developing factors in communities
<p>Self-efficacy <i>“I can do something to mitigate the effects of a disaster”</i></p>	<ul style="list-style-type: none"> • Encourage people to personalise information. • Provide practical information about ‘how to prepare’ and why it is effective and do so in small chunks rather than in large, comprehensive formats. • Start with easy to adopt items (e.g., emergency kits) and progressively introduce more complex/expensive items (e.g., structural changes to houses). • Develop separate strategies for owners and renters.
<p>Critical awareness <i>“Hazards are important, and I think and talk about hazards regularly”</i></p>	<ul style="list-style-type: none"> • Encourage thought and discussion amongst community members through provision of appropriate forums and formats (e.g., community members to review hazard scenarios, community to share experiences of disasters, community leaders to lead discussions, discussion and participation through community group events, etc.). • Encourage people to start talking about the benefits of being prepared.

Resilient factor/indicator	Recommendation for developing factors in communities
<p>Positive outcome expectancy <i>"I can deal with hazards and as a result there will be a good outcome"</i></p>	<ul style="list-style-type: none"> • Outline the complex nature of hazards, rather than focussing on damage and destruction. • Develop belief in people that mitigation for disasters can be effective. • Show that losses are avoidable, and show ways people can practically avoid loss. • Describe the immediate utility and/or benefits of mitigation. • Use comprehensive communication strategies to relay information, as well as participation and empowerment.
<p>Negative outcome expectancy <i>"Whatever I do I can't make a difference"</i></p>	<ul style="list-style-type: none"> • Reduce negative outcome expectancy by focussing on the realities of a disaster, rather than damage from an event being universal and total. • Show that the distribution of losses is not evenly spread (i.e., that more at risk or vulnerable communities are impacted more). • Show that people have control over disasters, i.e., that the choices they make over mitigation etc. can help them become more resilient to disasters. • Ensure communications are balanced (e.g., showing potential effects of a realistic disaster, but also showing how to cope). • Encourage people to think about what they might do to help the more vulnerable people in their neighbourhood/ community.
<p>Action Coping <i>"I deal with problems by undertaking action directly (rather than worrying)"</i></p>	<ul style="list-style-type: none"> • Include active problem solving as part of community education, participation and empowerment strategies. • Ask people to reflect on significant events in their past and on how they coped with these events.
<p>Community participation <i>"I actively participate in community activities"</i></p>	<ul style="list-style-type: none"> • Integrate any resilience-based Civil Defence Emergency Management (CDEM) work with community development planning and intervention. • Make use of existing groups to develop discussion and participation in hazard issues. • Encourage individual involvement in general community activities and functions. • Involve community leaders in resilience activities. • Identify, discuss and address salient issues within communities (these may be hazard-related or related to other issues e.g., crime). • Choose some hazard-related community-based activities to undertake (in association with other parts of the organisation or with other agencies if necessary), e.g., hazard mapping exercises, community response planning, drills, door-knocking, emergency training. • Work with schools as part of an integrated community resilience-building programme.
<p>Articulating problems <i>"I discuss and define problems, and help determine solutions for those problems"</i></p>	<ul style="list-style-type: none"> • Make use of participation and empowerment strategies as vehicles for articulating problems. • Ensure participatory activities include a specific focus on defining problems related to hazards, and how the community might solve those problems. • Assist the community in defining their own problems and coming up with their own solutions, rather than doing it for them.

Resilient factor/indicator	Recommendation for developing factors in communities
	<ul style="list-style-type: none"> Choose activities to undertake that assist with articulating problems, e.g., directed discussions about what to prepare for and how to prepare (individually and as a community as a whole); developing response and/or evacuation plans, undertaking drills and exercises; undertaking their own evaluation of activities. Involve community leaders in resilience activities, so that they can help the community discuss hazard problems and solutions.
<p>Empowerment</p> <p><i>“I can call upon personal and external resources, and deal with issues that arise”</i></p>	<ul style="list-style-type: none"> Ensure community members have the ability to consider issues and implement solutions (e.g., by ensuring adequate resourcing is available, by building skills in individuals through training, by undertaking community development). Integrate any resilience-based CDEM work with community development planning and delivery. Facilitate development at all levels (individual, community, institutional). Identify and target at-risk groups and engage with them to ensure that strategies are consistent with group needs and capabilities (this can include conducting ‘training needs analysis’ and developing competencies as part of an intervention program). Work with existing and emerging groups (particularly through local leaders – see below) that have community influence. Enable community-led risk reduction, rather than institution-led.
<p>Social Norms</p> <p><i>“Other people think preparing is important, or are prepared, so I should too”</i></p>	<p>Development of attitudinal and behavioural norms that support preparedness are influenced by:</p> <ul style="list-style-type: none"> participating in an interactive group situation or activity; being exposed to frequent information which stimulated critical awareness; active practice of hazards and preparedness activities; learning from an early age about hazards and preparedness and encouraging children to discuss school-based activities with their parents; and framing preparedness.
<p>Trust</p> <p><i>“I trust individuals, groups and organisations”</i></p>	<ul style="list-style-type: none"> Provide opportunities for people to have positive (empowering) experiences with providers of information to increase their trust in hazard and preparedness information when faced with uncertainty regarding potentially threatening events and their short and long term implications i.e., ensure information is accurate, clear, is available from multiple sources (e.g., CDEM sector, Ministry of Civil Defence and Emergency Management (MCDEM), District Health Board (DHB), community members, etc.), messages are consistent, and help people deal with their local issues, concerns and needs. Build trust around hazard mitigation expenditure, and ensure a fair and just spread of hazard mitigation actions. Make use of community participation, engagement and empowerment strategies to assess and facilitate people’s ability to understand and meet their local needs.

Resilient factor/indicator	Recommendation for developing factors in communities
	<ul style="list-style-type: none"> • Build trust not only with respect to the CDEM sector, but also in terms of wider associated institutions (e.g., the public might not recognise the CDEM sector as a distinct entity from the councils, and therefore broader trust building may be required across councils).
<p>Planning</p> <p><i>“I know what I am likely to experience and can develop ways of responding”</i></p>	<ul style="list-style-type: none"> • Provide opportunities to identify the implications hazard events will have for their community. • Facilitate people’s ability to personalise the implications of hazard events and their consequences for them (e.g., impact on family, impact on livelihood). • Integrate with community participation (see above) to develop neighbourhood/community plans to accommodate diversity of needs and interests, develop plans and how they will be put into action should a hazard event occur.
<p>Personal responsibility</p> <p><i>“I understand my role in how risk will be managed and how it contributes to community safety”</i></p>	<ul style="list-style-type: none"> • Encourage the belief that people and emergency management and response agencies play complementary roles in preparedness and response. • Clearly identify and distinguish what agencies will do, and what people and households should do to contribute to community safety.
<p>Social responsibility</p> <p><i>“I know we are all in the same boat and need to develop ways we can respond”</i></p>	<ul style="list-style-type: none"> • Articulate hazard issues in terms of shared fate (i.e., it’s everybody’s problem). • Identify interdependencies between people and groups (e.g., need to be able to care for one another if cut off from normal resources, identifying more vulnerable members of the community and how their needs can be met). • Clearly identify and distinguish what agencies will do and what neighbourhoods/communities can do to contribute to community safety.
<p>Sense of community</p> <p><i>“I will have to rely on other people and they will be relying on me”</i></p>	<ul style="list-style-type: none"> • Identify hazard issues in terms of shared fate and the benefits of collective action to manage hazard events. • Encourage maintenance of interdependence by giving to and doing for others (e.g., in conjunction with community participation activities). • Encourage the perception that people are part of a larger, stable and dependable community. • Develop mechanisms such as Neighbourhood Emergency Response Teams.
<p>Leadership</p> <p><i>“It is important to ensure that our actions are guided and coordinated by someone who knows our community”</i></p>	<ul style="list-style-type: none"> • Identify people within neighbourhood/community with general (e.g., management experience) and specific (e.g., skills such as relationship building) leadership skills. • Identify people willing to assume leadership responsibility to support planning and plan implementation (including skills such as planning, problem solving, decision making, conflict management). • Include issues such as leadership and succession planning (e.g., rotating leaders to deal with specific issues, minimising burnout during response and recovery).

Resilient factor/indicator	Recommendation for developing factors in communities
<p>Collective efficacy <i>"We know how to work together to deal with issues that arise"</i></p>	<ul style="list-style-type: none"> • Encourage identification of neighbourhood impacts and consequences and how these could be dealt with within group settings. • This may require facilitation and mentoring for groups that lack appropriate collective planning, conflict management and problem solving skills. • Group meetings should be designed to integrate the provision of information/actions with the development of planning and problem solving skills in the group.
<p>Place attachment <i>"This is a great place to live and I want to do what I can to maintain my lifestyle here"</i></p>	<ul style="list-style-type: none"> • Encourage a sense of belonging in the physical location through identifying, for example, local (e.g., heritage, symbols such as art deco architecture) and natural amenities to increase people's sense of emotional investment in their community. This, in turn, increases motivation to take action to prepare to sustain attachment.
<p>Experience <i>"Being prepared helped me respond to a hazard event"</i></p>	<ul style="list-style-type: none"> • If possible, identify people within communities that have had direct or indirect hazard experience and that can testify to the benefits/effectiveness of being prepared and able to take action. • Involve them in developing and delivering risk and preparedness messages/actions to increase the ability of other community members to identify with the issues identified.
<p>Resourcing <i>"We know who can do what in our community"</i></p>	<ul style="list-style-type: none"> • Use participatory planning to identify the resources available within communities. • In conjunction with participatory planning, identify the additional resources communities will need to develop, implement and action plans. • Identify external (e.g., agency, community and government) sources communities can contact, to discuss resource needs should a hazard event occur.
<p>Psychological preparedness <i>"Having thought about what I might experience helped me cope"</i></p>	<p>Psychological preparedness is enhanced by helping people to:</p> <ul style="list-style-type: none"> • anticipate the anxiety and concerns that will arise (e.g., what makes an event threatening, what would happen if you had to evacuate and be temporarily re-settled; what would happen to your job?); • identify uncomfortable or distressing thoughts and emotions that may cause further anxiety; and • find ways of managing the responses so that one's coping capacity remains as effective as possible (this step can be integrated with the developing of coping and planning discussed above).

6.1 DIFFERENT STAGES IN BECOMING RESILIENT

People and communities are, at any one time, at different stages of willingness or readiness to develop competencies and knowledge (Paton & Wright, 2008). Some have decided not to act. Others may be interested in preparing, but have yet to commence this process (labelled here as 'pre-contemplators' – they have yet to engage in the preparedness process). Of those who are preparing (labelled 'contemplators' – they are thinking about preparing more than acting), some have adopted only a few measures while some are more comprehensively prepared (labelled 'action' group – they are actively preparing). The fact that it is possible to differentiate people with regard to their position within a continuum from 'not prepared' to 'very prepared' has implications for the development of risk communication and outreach strategies. For example, for people in the 'decide not to act' group, strategies must focus on getting them to a point where they are motivated to think about preparing. There is a role for managing negative outcome expectancy in order to achieve the goal of motivating preparedness.

Negative outcome expectancy reflects people's assumptions that because it is not possible to prevent hazard events occurring (e.g., they result from uncontrollable natural causes) their consequences (e.g., house collapse) are also uncontrollable, and so they believe taking action is futile. The reality is that while the hazard event is uncontrollable, its consequences can be influenced by actions people can perform to enhance the ability of their house to mitigate the risk. Consequently, public outreach should assist people to differentiate between the uncontrollable event (i.e., earthquake) and the controllable consequences (e.g., how effects of ground shaking can be mitigated by specific actions) (Paton & Wright, 2008).

One way of achieving this outcome involves presenting images of houses in close proximity to one another that illustrate how damaged/destroyed houses can occur alongside or nearby those less or undamaged. Faced with this contrast, people find it difficult to attribute loss and damage to houses from 'uncontrollable' events. The fact that some houses survived raises the possibility that factors over which people have control (e.g., building characteristics) can make a difference to their survival. Reducing negative outcome expectancy will not, however, automatically motivate preparing. For this to occur, strategies are required to get people to start preparing.

Getting people started involves developing strategies that focus on moving people progressively through the pre-contemplation and contemplation stages until they are at the action stage and are committed to preparing. Some examples of strategies that can be used to assist this process are described below.

For those in the pre-contemplation category, the goal is to get people to start preparing. The general lack of comprehensive knowledge of hazards held by members of this group can make it counter-productive to provide them with information about the hazards and their consequences. Providing those at this stage in the preparedness process with information about their vulnerability and the intensity of events that could occur can increase anxiety and prevent them progressing their preparedness. The alternative is to gradually increase people's perceived susceptibility and vulnerability by inviting them to personalise the issues for themselves (Paton & McClure, In prep). For example, ask them to first identify how an earthquake might impact on them, their family and their livelihood and then encourage them to seek information to deal with issues they have identified. This way people generate beliefs about their vulnerability and its implications for themselves. This increases people's risk acceptance and develops some level of commitment to moving the preparedness process forward.

Another strategy to motivate people into getting prepared is to provide information on what people in similar circumstances to themselves have done. At this level, the community outreach and engagement component of a risk management strategy can facilitate people's ability to formulate solutions to the issues they have identified. These activities help them develop their self-efficacy and positive outcome expectancy (POE) beliefs and help sow the seeds for moving to more advanced levels of preparedness.

An important predictor of POE is the level of people's understandings of the relationship between disaster effects and their mitigation. As this increases, the more likely people are to believe that damage can be prevented (Paton & McClure, In prep). The likelihood of adoption can be increased by explicitly illustrating and explaining how specific disaster effects (e.g., ground shaking) can be mitigated by specific house design features. This approach also benefits from presenting information about the relationship between house characteristics and reducing risk sourced from (similar) communities that have experienced and successfully survived disaster events as a result of adopting the kinds of protective measures described above (Paton & Wright, 2008). Engaging people in this way helps moves them to the contemplation stage.

With regard to people who are interested in preparing, but who are in the contemplation stage, preparing can be facilitated by providing them with additional, specific information on their vulnerability and the severity of event they could experience. Having developed positive outcome expectancy beliefs in the earlier stage reduces the likelihood of this information overwhelming them. By increasing their hazard knowledge and explaining explicitly how preparation and protective measures contribute to safety, their positive outcome expectancy and the likelihood of their adopting preparedness and protective measures is increased (Paton & McClure, In prep). It is also appropriate at this stage to encourage discussion of risk and risk management in community settings. These activities increase the likelihood of people developing comprehensive preparedness plans and their willingness to put them into practice.

For those in the 'Action' group, the goal is to facilitate sustained adoption. This can be done by continuing to provide information and discussion in ways that contribute to the continued development of hazard knowledge, positive outcome expectancy and the benefits of preparing, self-efficacy, and community action, and empowerment. People's level of commitment to preparing allows for the use of more advanced public outreach techniques. These include providing examples of comprehensive preparedness, demonstrations of how to implement actions and how they work, and property assessments.

People in the action stage are also well placed to contribute to public outreach and engagement strategies that can assist those in the earlier stages of preparedness. This can be accomplished using techniques such as collaborative learning and peer tutoring in community and neighbourhood settings and working with community leaders to create empowering settings in which public outreach strategies can be applied (Paton & McClure, In prep). Additional techniques at this stage include conferences, design meetings, workshops, seminars, consultative liaison committees, and public forums to discuss new and future issues.

7.0 FUTURE COMMUNICATION PRACTICE

This review of community resilience research shows that there a number of individual, community and societal/institutional factors that can influence resilience. These factors, which can be represented as an overall model of resilience, need to be considered and accounted for when developing effective communication strategies. An effective strategy should include a variety of activities (e.g., effective messaging, community meetings, scenario-building, school and work activities, drills and exercises, training, etc.) to target and build the different resilience factors and to account for the differing stages of readiness that members of the public are at.

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