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THESIS

**COMMUNITY PREPAREDNESS:
CREATING A MODEL FOR CHANGE**

by

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March 2010

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COMMUNITY PREPAREDNESS: CREATING A MODEL FOR CHANGE

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ABSTRACT

Although the United States has made great strides in improving its capacity to respond to and mitigate large-scale incidents resulting from acts of nature or deliberate acts of man, the development and improvement of community resiliency and preparedness has lagged behind. National surveys have shown that our nation's residents are not as prepared as they believe they are or know they should be, and reveal a national population that is largely unprepared and potentially vulnerable to a catastrophic event.

Attempting to improve upon low preparedness levels, the Citizen Corps Personal Behavior Change Model for Disaster Preparedness (PDP) was introduced as a tool to assist in the design of outreach/social marketing preparedness programs. This thesis examines the underlying theoretical constructs of the PDP Model and identifies their limitations and gaps. The Community/Individual Integrated Model, which provides for an integration of individual and community-based behavior change models, is proposed and compared to the original PDP Model. It is suggested that, through the use of this model, a coordinated and matched approach between an individual and his/her community can develop a preparedness program that maximizes social relationships and moves the entire community, not just individuals, through the behavioral stages of change.

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I. INTRODUCTION

A. PROBLEM

The many terrorist-related events witnessed around the world since the September 2001 attacks on the World Trade Center and Pentagon have raised the consciousness of people to the threat terrorism poses to the United States and the world at large. Large natural disasters, such as Hurricane Katrina, have opened the eyes of the nation to the demand such large scale disasters place on the emergency services. According to the National Response Framework, “Resilient communities begin with prepared individuals and depend on the leadership and engagement of local government, NGOs, and the private sector” (U.S. Department of Homeland Security [DHS], 2008). That opening statement serves to explain the local government’s role in developing a prepared community.

Since September 11, 2001, responders and government officials, from all branches and levels of government, have begun to grasp the fact that preparedness is no longer just a catch phrase. It is a national priority that must become a reality. In spite of this fact and our nation’s recent experiences of terrorist attacks and large-scale natural disasters, our citizens are not adequately preparing themselves for such events. Surveys conducted by the Marist College Institute for Public Opinion for the National Center for Disaster Preparedness during the summer of 2006, revealed that while nearly 82 percent of the public feels that the United States will experience more terror attacks in the future, only 32 percent were prepared to some degree for those major disasters. (National Center for Disaster Preparedness, 2006) While 80 percent of people surveyed felt that the United States would experience new terror attacks and 47 percent of the respondents indicated that they believed that they would personally experience a major disaster within the following five years, only 34 percent indicated that they have started preparing for a major disaster (National Center for Disaster Preparedness, 2007). It is ironic that despite these perceptions of vulnerability, only a small proportion of people have taken the steps to prepare themselves.

Since the September 11 terrorist attacks, surveys have shown that there is a gap between what our stated national priorities are and the reality of the actions, or lack of, on the part of this country's citizens. The American Red Cross conducted a 2003 telephone survey of 1000 participants from throughout the country and only 27 percent of respondents stated that they were "very confident" in their level of preparedness at home (Opinion Research Corporation, 2003). They conducted a similar survey a year later, where 1001 adult Americans were sampled to assess and compare the previous year's preparedness levels. That survey reported that of all the respondents, only 22 percent felt that they were "very" prepared for a catastrophic disaster. (Greeves & Dalbec, 2004).

A 2006 national survey, conducted by the Council for Excellence in Government (CEG), randomly sampled 1000 Americans across the country and measured seven behavior-based actions as a measure of preparedness (Council for Excellence in Government, 2006). These included having actually prepared an emergency disaster kit, established specific emergency meeting places or practiced an emergency plan at home. Only eight percent of the respondents had taken all of the identified actions for preparedness (Council for Excellence in Government, 2006). Similar surveys performed in 2007 and 2008 revealed that the number of individuals whom had taken all actions towards preparedness had dropped to two percent in both years (Council for Excellence in Government, 2008).

Hurricane Katrina was the most devastating disaster to strike the United States. It was also one of the most watched and followed by Americans. Millions of Americans watched the daily news programs and witnessed the events unfolding before their eyes. There were several surveys taken both pre- and post-Katrina that indicated that much more needs to be done in the area of motivating preparedness. Despite all of the devastation witnessed, surveys conducted in 2005 for the New York University's Center for Catastrophe Preparedness and Response (CCPR) indicated that more than half of the respondents nationwide felt that they were less prepared after the disaster than before (Light, 2005). A survey conducted for the American Red Cross and CEG revealed that 38 percent of Americans did not consider the Katrina disaster as motivation to prepare themselves for emergencies (Council for the Excellence in Government, 2005). Although

witnessing heart-wrenching scenes of families separated by the disaster, only 36 percent of adults surveyed after the disaster had taken the time to put an emergency communication plan together for their family. That number was a decrease from the 41 percent surveyed pre-Katrina in August 2005 (Council for the Excellence in Government, 2005).

It is disheartening to see that, although the advancement and improvement of our nation's citizen preparedness has been given a high priority, most citizens have chosen not to prepare themselves. Public campaigns to improve the state of preparedness of our nation's citizens have failed to make an impact. Our messages of preparedness, in whatever form they take, must be improved to increase their effectiveness on the public. A more successful form of messaging must be embraced by emergency preparedness officials in order to turn this troubling trend around.

B. RESEARCH QUESTION

The Citizen Corp Personal Behavior Change Model for Disaster Preparedness (PDP) model suggests messaging that addresses the identification of barriers to preparedness planning on an individual basis. The fact that an individual's perceived preparedness barriers can vary dramatically based on their place within a geographic or socio-economic community suggests that a model that incorporates both individual and community-based behavior change constructs may offer greater effectiveness and behavior modification. This change would suggest locally customized programs, tailored to the individual and their community, rather than a national one-size-fits-all message.

The research question to be answered by this thesis is:

How can one extend the "*Citizens Corp Personal Behavior Change Model for Disaster Preparedness*" model to adequately address both the community's influence on individual behavior change and the individual, in order to improve the model's effectiveness in changing disaster preparedness behavior?

C. ARGUMENT

Appearing before the Ad Hoc Subcommittee on State, Local, and Private Sector Preparedness and Integration, Deputy Administrator Dennis Schrader stated on June 5, 2008, “Citizen preparedness and participation has been a cornerstone of homeland security efforts since World War I” (It Takes a Village, 2008a). Unfortunately, although disaster preparedness is recognized as important, a small percentage of individuals actually take the necessary steps to prepare themselves. In his opening statement to that Subcommittee, Senator Mark Pryor acknowledged the low rate of national civilian preparedness and stated, “Creative outreach strategies are crucial to improving these low numbers” (It Takes a Village, 2008b).

In an effort to improve upon traditional methods of preparedness education and motivate individuals to prepare, FEMA’s Citizen Corp proposed that a new model, the Citizen Corp *Personal Behavior Change Model for Disaster Preparedness*, become the recognized standard for modern community preparedness programs (ORC Macro, 2006). Considering the critical nature of improving civilian preparedness rates, it is important to ensure that any proposed preparedness change model make use of the most effective behavior change constructs.

As individual behavior is influenced and shaped by the surrounding environment, an effective preparedness change model must identify and incorporate the community within which the individual resides. Additionally, just as an individual may be located along a point in a continuum of change, the community, as a larger organism, also exists on a continuum of change. Identifying the point where that community resides is crucial to developing an effective preparedness program. It is argued that effective preparedness messaging must be tailored and developed to address the stage of change of both the individual and the community.

This thesis will be developed by examining the underlying theoretical constructs of the PDP Model and identifying their limitations and gaps. An alternative integration of an individual and community-based behavior change model will be examined to

determine if it addresses behavior change at both the individual and community level. A new model will then be developed from this integration, which will be compared to the Citizen Corp PDP Model construction.

D. SIGNIFICANCE OF RESEARCH

This thesis could, through the improvement of the PDP Model, allow community planners to maximize their preparedness messaging effectiveness. A robust behavior change model, which addresses all individual and community factors that hinder disaster preparedness behavior, would have implications for national level homeland security professionals and state or local government agencies tasked with improving community preparedness.

Although a large body of literature exists that describes various health-related behavior change models, there is very little in the way of behavior change model-based suggestions for improving civilian preparedness behavior. One exception to this is the Citizen Corp Personal Disaster Behavior Change Model (ORC Macro, 2006). This thesis will add to the existing body of literature by examining the PDP's underlying individual behavior change model constructs, identifying a complementary community-based change model and developing an integrated community/individual behavior change model.

Future research efforts will be able to utilize the results of this thesis to build alternative behavior change models that incorporate community-based constructs and present a better foundation upon which to build preparedness program messaging. Future pre- and post-preparedness program surveys should be performed to validate the effectiveness of the change model constructs utilized. Eventually, it is hoped that a comprehensive community/individual behavior change model would be available to preparedness professionals so as to enable the development of custom preparedness program messages that match the psycho-social needs of the target community, as well as the needs of the individual.

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II. LITERATURE REVIEW

The Citizen Corps' *Personal Behavior Change Model for Disaster Preparedness* (PDP) is supported by two theoretical behavior change theories; the Extended Parallel Process, which is a fear appeal model, and the Transtheoretical Model, which represents a stage of change model. These are both individual-based theories. Sub-Chapter A will examine the Extended Parallel Process. Section 1, *Fear Appeals* will explore the literature surrounding the early development of fear appeals. Section 2, *Protection Motivation Theory* will examine Rogers' extension of earlier basic fear appeal models into his Protection Motivation Theory. Section 3, *Extended Parallel Process* will look at the literature describing Witte's development of an expanded parallel process of behavior change. Its application, current use in the Citizen Corp PDP Model and limitations will be discussed in Section 4, *Application* and Section 5, *Analysis*.

Sub-Chapter B will discuss the literature surrounding the Transtheoretical Model. Section 6, *Development of the TTM* will examine the development and elements of the Transtheoretical Model. Section 7, *Application* will look at the TTM's use in behavior change and the role it plays within the PDP Model. Finally, Section 8, *Analysis* will examine the literature surrounding its effectiveness and acceptance by behavior change professionals.

A. THE EXTENDED PARALLEL PROCESS MODEL

1. Fear Appeals

Fear has been used for decades to motivate individuals into changing their behavior in attempts to break addictions, purchase goods or engage in healthy or safe practices. However, the manner in which fear is aroused and acted upon has been the subject of much debate and theory for more than half a century. Fear has been defined and described in many ways. Rogers (1975) considered fear to be a "relational construct, aroused in response to a situation that is judged as dangerous and toward which protective action is taken." Witte and Allen (2000) described fear simply as "a negatively

valanced emotion, accompanied by a high level of arousal.” Lang (1984) described the manners in which fear responses could be elicited. She stated that fear could be detected in individuals through the physiological changes in their bodies, through their self-reporting of their feelings or through the observance of obvious physical acts.

Fear appeals, or the messages that use fear as a means to scare people to action, were examined by Janis and Feshbach in experiments involving high school students and dental hygiene education (1953). Prior experience with patients undergoing psychiatric treatment had lead clinicians to observe three unique types of reactions to anxiety producing communications. Some patients became inattentive when interventions triggered feelings of anxiety and some became aggressive towards the person initiating the anxiety-producing communication. Subsequent anxiety-producing communications with patients, which did not contain any reassurance to reduce the anxiety, caused them to exhibit a defensive avoidance behavior (Janis & Feshbach, 1953).

Intrigued by these observations, Janis and Feshbach arranged a study of 200 high school freshmen to determine the effects of fear messaging on non-psychiatric patients. The students were divided into four groups of twenty-five. Three groups were shown one of three dental hygiene messages. One message was minimally fear inducing, one moderately fear inducing and one message that was strongly fear inducing. A fourth group was used as a control and received an inert health message on another topic. Following the hygiene classes, questionnaires were completed by the students to measure their reactions to the messages they received. The results of that experiment led Janis and Feshbach to theorize that fear inducing messages did indeed influence an individual’s motivation to accept the associated anxiety-reducing recommendation (Janis & Feshbach, 1953).

Through this and other studies, Janis and Feshbach have theorized that fear arousals motivated individuals to action. They believed that their experiments also showed that this motivation had limitations. When studying the relationship between the fear arousal and the motivation to act, the researcher’s data suggested an inverted U-shape and not a direct and positive linear relationship. As illustrated in Figure 1, it was their belief that as fear arousal increased (horizontal movement to the right), attitude

change, or motivation, would increase (vertical movement upward). Nevertheless, when the optimum threshold of fear was reached, motivational change peaked and any additional fear arousal resulted in diminished changes in attitude. According to their dental hygiene studies, they theorized that “when fear is strongly aroused but is not fully relieved by the reassurances contained in a mass communication, the audience will become motivated to ignore or to minimize the importance of the threat” (Janis & Feshbach, 1953).

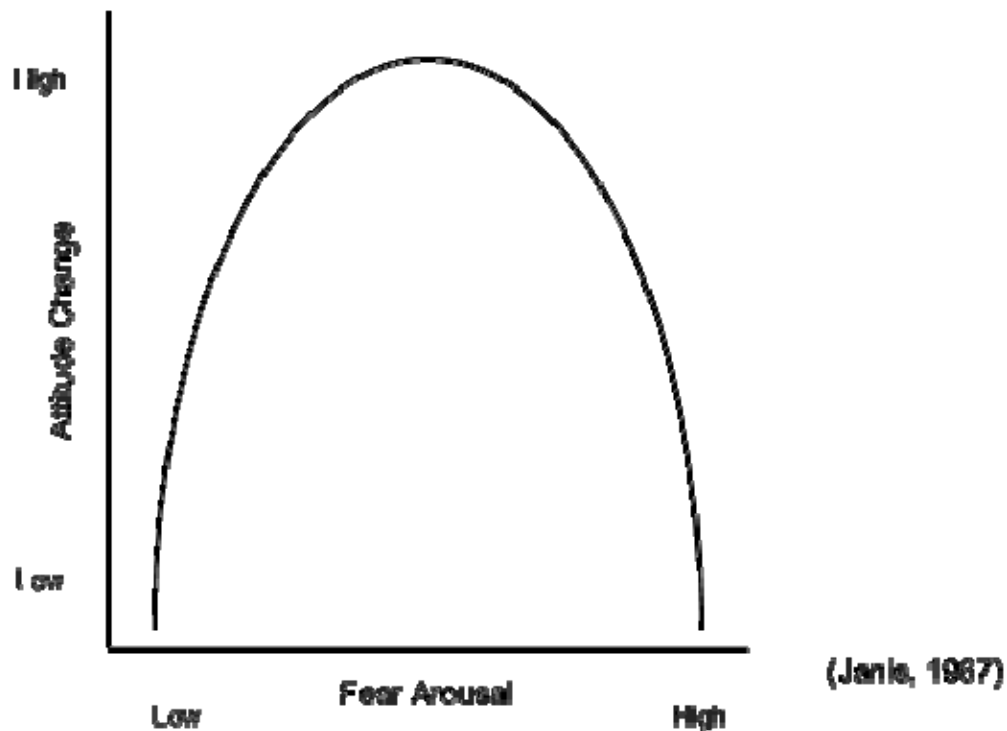


Figure 1. Fear/Motivation Relationship (from Janis, 1967)

Janis (1967) theorized that when individuals were exposed to a fear appeal, a tension was created within the person, which they then sought to reduce. It was this tension-reducing reaction that made fear appeals motivational. Leventhal (1971) described this fear drive in his paper, *Fear Appeals and Persuasion: the Differentiation of a Motivational Construct* and explained, as illustrated in Figure 2, that when a person is exposed to external danger, the emotion of fear is created, which is perceived by the person as tension. The individual then seeks to take some action in an attempt to reduce the tension. If, following the action, fear has been eliminated, the individual will no

longer act. Should fear persist, the person would be driven to action once again. According to Janis (1967), whatever behavior reduces the tension would become the preferred method of dealing with later exposures, regardless of whether that behavior was adaptive or maladaptive.

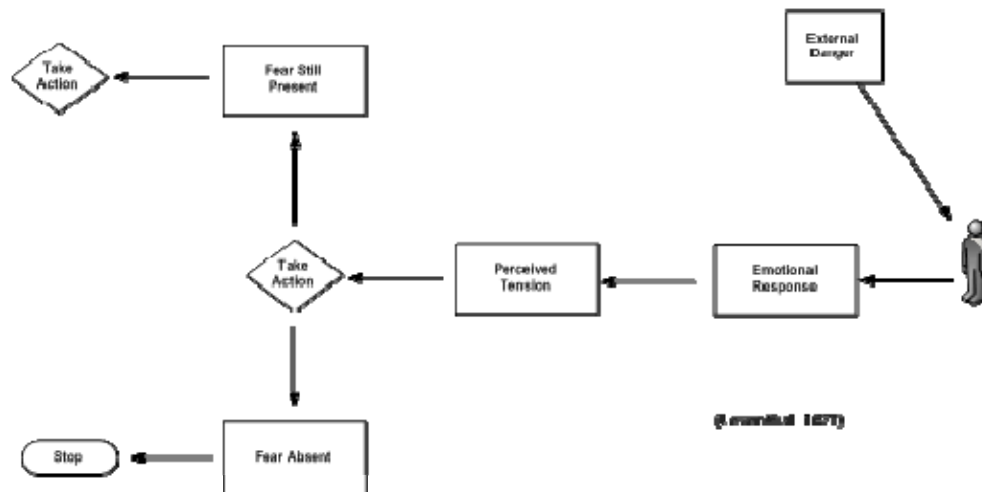


Figure 2. Fear Drive (from Leventhal, 1971)

The inverted U-shape model was rejected by most social researchers in the early 1970s (Witte & Allen, 2000). An alternative view of fear appeals was put forth by Leventhal (1971), who proposed that when one was exposed to danger, there was a “parallel response” that incorporated protective action, attitudes towards the danger and emotional behavior. According to Leventhal (1971), “The basic assumption of this paradigm is that emotional responses (such as fear) and adaptive responses (such as belief changes and protective health acts) are arranged in a parallel rather than a serial relationship” (see Figure 3).

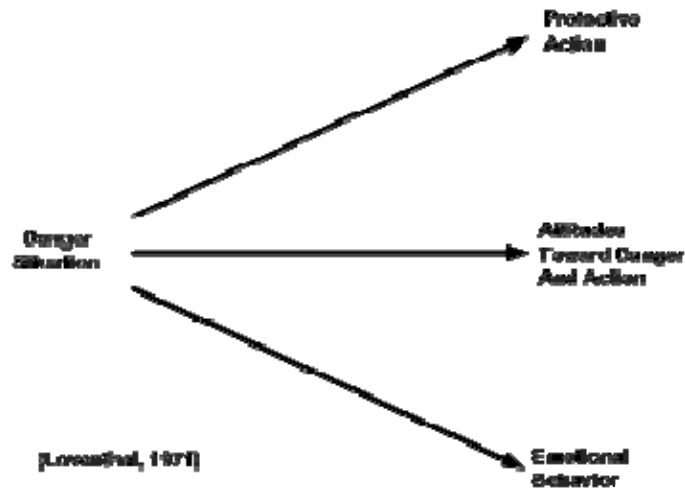


Figure 3. Parallel Model (from Leventhal, 1971)

According to the theory, two processes occurred during the parallel response; “danger control processes (efforts to control the threat/danger) and fear control processes (efforts to control one’s fear about the threat/danger)” (Witte & Allen, 2000). Leventhal posited that these processes occurred simultaneously and independently of one another (1971). His parallel process theory contrasted with the fear drive model that had been thought of as a linear process with each step linked to the next.

The parallel manner of assessing danger, Leventhal theorized, occurred in a cognitive encoder process, where coping behavior and fear behavior are assessed simultaneously. Individuals, when presented with an external danger stimulus, would consciously or cognitively work to either control the threat or control the emotion of fear (Leventhal, 1971). These two processes were not considered mutually exclusive as the final response could include some degree of both danger control and fear control activity (Leventhal). Figure 4 illustrates how, after an initial response to an external danger, the individual’s own danger control and fear response actions create additional feedback to the cognitive encoder process upon subsequent presentations of external dangers. Thus, Leventhal proposed that any cognitive encoder inspired action was the result of three stimuli:

1. The external danger
2. Prior danger control actions.
3. Prior fear response actions

While this theory was never thoroughly proven empirically, the theoretical base it created served as a foundation for future fear appeal theory development (Witte, 1998).



Figure 4. Danger and Fear Control (from Leventhal, 1971)

2. Protection Motivation Theory

Rogers (1975) later expanded upon Leventhal's parallel response. Again, in contrast to Janis' belief that "fear-arousing messages produce a negative drive state that motivates people to take action" and had a maximum threshold level, Rogers theorized that strong fear appeals appeared to work best (Witte, 1998). Protection Motivation theory (PMT) de-emphasized the fear aspect of the threat appeal, focusing instead on the cognitive process of danger control (Witte, 1992). As Rogers (1975) explained, "The protection motivation theory makes it clear that one is coping with and avoiding a noxious event rather than escaping from an unpleasant emotional state of fear."

PMT was based on the notion that an individual's response to a threat was a result of both an appraisal of the threat and an appraisal of that individual's ability to cope with the threat (Block & Keller, 1998). The three variables shown in Figure 5, magnitude of

noxiousness, probability of occurrence and the efficacy of the recommended response, were described by Rogers as being cognitively processed independently and influenced, to different degrees, by the intensity of each respective variable (1975).

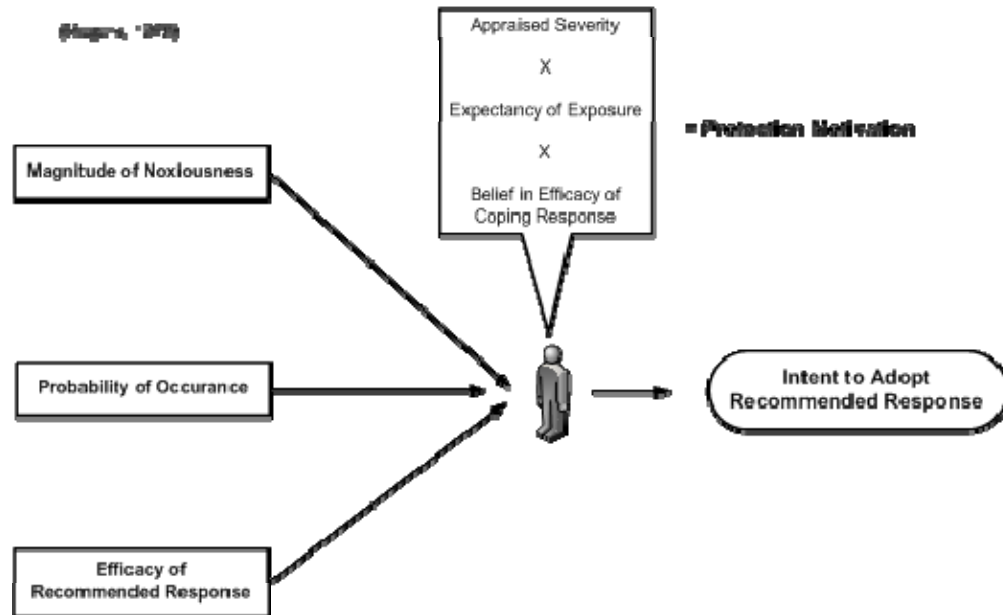


Figure 5. Rogers' Original Protection Motivation Model (from Rogers, 1975)

When fashioning his theory, Rogers (1975) developed the notion of “perceived threat” and “perceived efficacy.” Breaking these down further, Rogers posited that a perceived threat was a function of an individual’s awareness of being susceptible to a threat and the severe effects the threat posed (Witte & Allen, 2000). Perceived efficacy originally consisted of an individual’s perception of the effectiveness of the recommended actions. Later, a fourth element was added by Rogers to the theory’s variables (Witte, 1998). This element was described as the receiver’s perceived ability to perform the message’s recommended action (Witte, 1998).

Rogers believed that “a positive linear function” was formed by those four elements (Block & Keller, 1998). When faced by a threat communication, individuals will assess the severity and susceptibility of the threat, their ability to carry out the recommended protective actions and the effectiveness of those actions. Rogers (1975) originally believed that the variables acted in a multiplicative fashion with each other and

that if an individual assessed any of the variables to be absent or zero, the net resulting motivation to self protect would be zero. Later, lacking any empirical data to support this belief, he substituted his multiplicative rule with an additive one (Block & Keller). Thus, if the actions were deemed effective and the individual felt capable of performing them, Rogers theorized that the protective action would be undertaken (Block & Keller).

3. Extended Parallel Process

In 1992, Kim Witte introduced a new theory called the Extended Parallel Process Model (EPPM). In her paper, *Putting the Fear Back into Fear Appeals: The Extended Parallel Process Model*, Witte (1992) believed that the role of fear as a motivator had become de-emphasized in the theories proposed following Janis' initial research. Her model re-emphasized fear as the central component of the response. Citing the inconsistent data coming from fear appeal studies, she listed three shortcomings that resulted in a "lack of convergence" in research findings (Witte).

A misuse of terms throughout behavior studies was identified as one cause of study data inconsistency. Using the terms fear and threat interchangeable within studies, even though each produce a distinctly different outcome, was one example given by Witte (1992). The failure to identify why fear appeal messages were rejected and an exclusive focus on fear message acceptance were identified as reasons for inconsistent empirical results. Witte suggested that more focus be placed on the fear control side of the cognitive process to better understand why fear appeal messages were rejected. The third and final reason provided by Witte was a lack of exploration of the interaction between threat and efficacy. Witte claimed that researchers had failed to explore the manner in which their studies were influenced by efficacy differences.

According to Witte (1992), a fear appeal consists of the three components shown in Figure 6. A fear element is something that will elicit a feeling of fear with the receiving individual. Fear, which is described as an emotion, can be exhibited in several ways. Physiologically, a person's body will display fear through outward or internal signs of arousal, such as increased heart rate or rapid breathing. Cognitively, fear can be

described verbally through self reporting. This has been described as a very reliable method of measuring fear (Witte). Finally, fear can be visibly displayed through facial expressions.

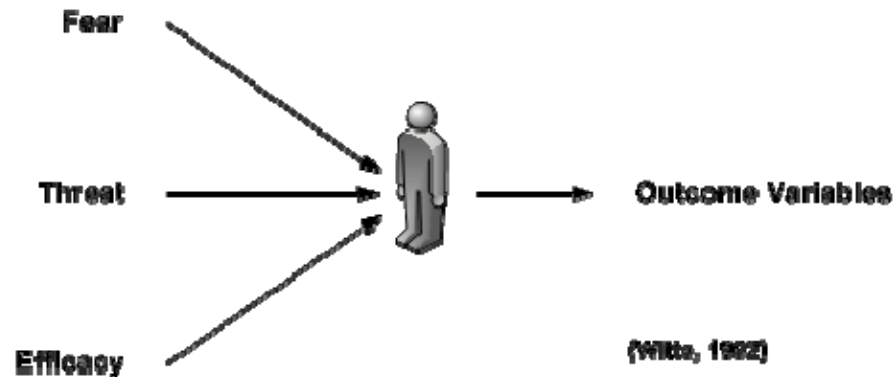


Figure 6. Three Elements of a Fear Appeal (from Witte, 1992)

A threat is described as “an external stimulus variable (e.g., an environmental or message cue) that exists whether a person knows it or not” (Witte, 1992). An individual’s perceptions of how vulnerable they are to the threat and how severe the threat is are considered to be their perceived susceptibility and perceived severity, respectively. If a person is aware of the presence of an actual threat, they are considered to have perceived a threat (Witte).

Efficacy, within a fear appeal, exists as two components. Response efficacy refers to an individual’s perception of the effectiveness of an appeal’s response message. Self-efficacy refers to the individual’s perception of his or her own ability to perform the appeal’s response message. The three elements described, fear, threat and efficacy, combine to form the fear appeal and, hopefully, motivate the individual to accept the response message, which is considered the outcome variable.

In developing her new model, Witte began with Leventhal’s original parallel process, which she considered a good theoretical framework, and added Roger’s Protective Motivation theory of cognitive danger control (Witte, 1992). Expanding upon

these core components, she constructed an expanded model which, she believed, more completely delineated the fear control, or message rejection, aspect of fear-based behavior (Witte).

The EPPM depicts two separate parallel processes that, in reaction to a fear appeal, occur in a direct linear fashion (see Figure 7). When exposed to a threat or fear appeal, Witte (1992) theorized that an individual would first assess how susceptible they were to that threat (threat susceptibility) and how severe the threat was to them (threat severity). If the assessment resulted in a high level for both, the process would move on to an efficacy assessment. However, if the threat assessment were deemed to be low or non-existent, there would be “no motivation to process the message further; efficacy is not evaluated and there is no response to the fear appeal” (Witte, 1992).

Following a high threat appraisal, the individual would next assess their perceived efficacy, or ability to effectively fend off or protect themselves from the threat. According to Witte (1992), individuals will evaluate the proposed protective measures and determine if they feel capable of performing the actions (self-efficacy) and how effective they feel those actions will be in helping to protect them from the threat (response efficacy). Should individuals feel they are capable of performing the protective action and that those actions will be effective, they will undertake beneficial “danger control.” In a situation such as this, individuals’ actions, guided by the danger control process, would “respond to the danger and not the fear” (Witte).

On the other hand, should a significant threat be presented and individuals perceive a low level of efficacy, a fear control process would begin (Witte, 1992). The inability of individuals to cognitively believe that they can avert the threat will motivate them to begin dealing with their feelings of intensified fear. It is at this point where “fear control” behavior, such as “defensive avoidance and perceived manipulation” will manifest itself and block any action of individuals to protect themselves (Witte). In the overall process described by Witte, perceived threat determines the degree or intensity of the reaction to the message, while perceived efficacy determines the nature of the threat” (Witte).

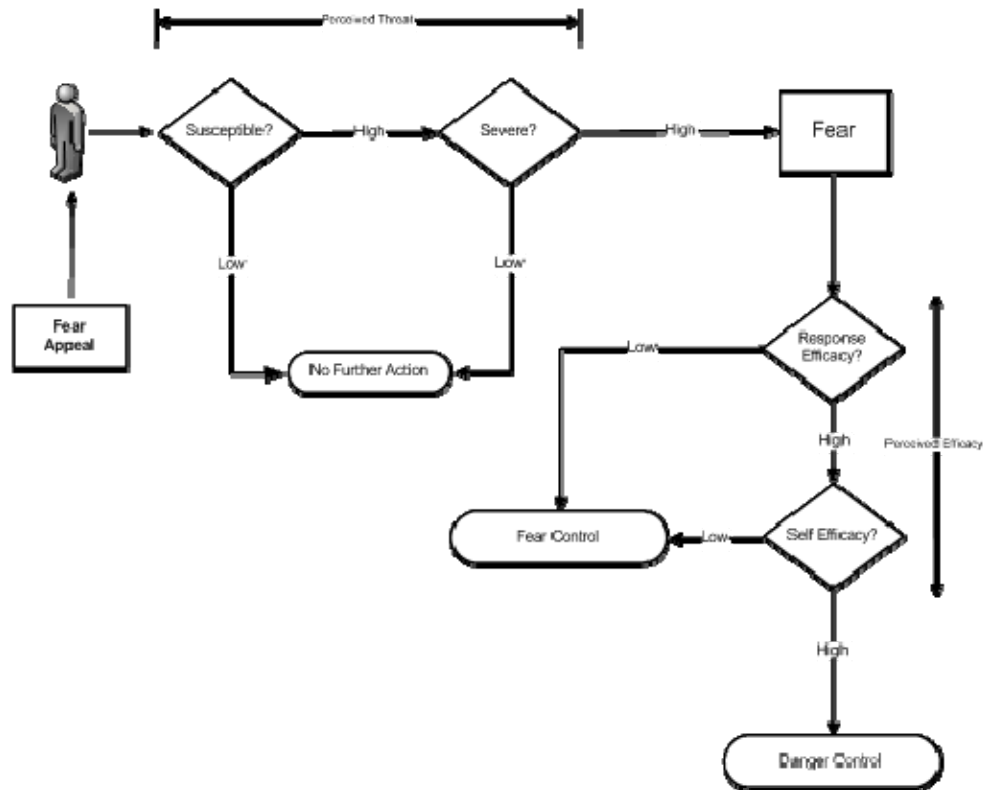


Figure 7. Extended Parallel Process Flow

Interestingly, Witte's Extended Parallel Process model does include an inverted U-shape response curve (Witte, 1998). Her theory holds that as high threat messages increase in severity, assuming an individual's perceived efficacy is moderate, the motivation to perform the recommended protective action will increase to a certain point but then begin to decrease as the influence of fear begins to dominate (Witte). This response curve is similar in appearance to the one described by Janis.

The Extended Parallel Process Model takes individual differences, such as anxiety or prior experiences, into account by positing that they directly influence the outcome process by changing the person's perception of threat and efficacy (Witte, 1998). By way of example, an anxious individual may perceive a threat to be more severe than another person or they may perceive a protective action to be more difficult to perform than someone else does. Thus, due to different perceived threats or efficacies, this individual's outcome of fear control may be indirectly influenced by their anxiety.

Figure 8 illustrates the two key elements to the processing of a fear appeal's message components of self-efficacy, response efficacy, susceptibility and severity. Initially, the perceived threat will determine if any further danger control or fear control processing will occur. If the perceived threat is low or non-existent, no further processing of the message will occur. "Witte (1991) found the least amount of attitude, intention, and behavior change in the low threat condition, regardless of efficacy level" (Witte, 1992). If the threat is perceived to be high, the efficacy of the message's protective actions will be evaluated and the result will determine which leg of the parallel process will dominate, danger control with adaptive behavior or fear control with maladaptive behavior.

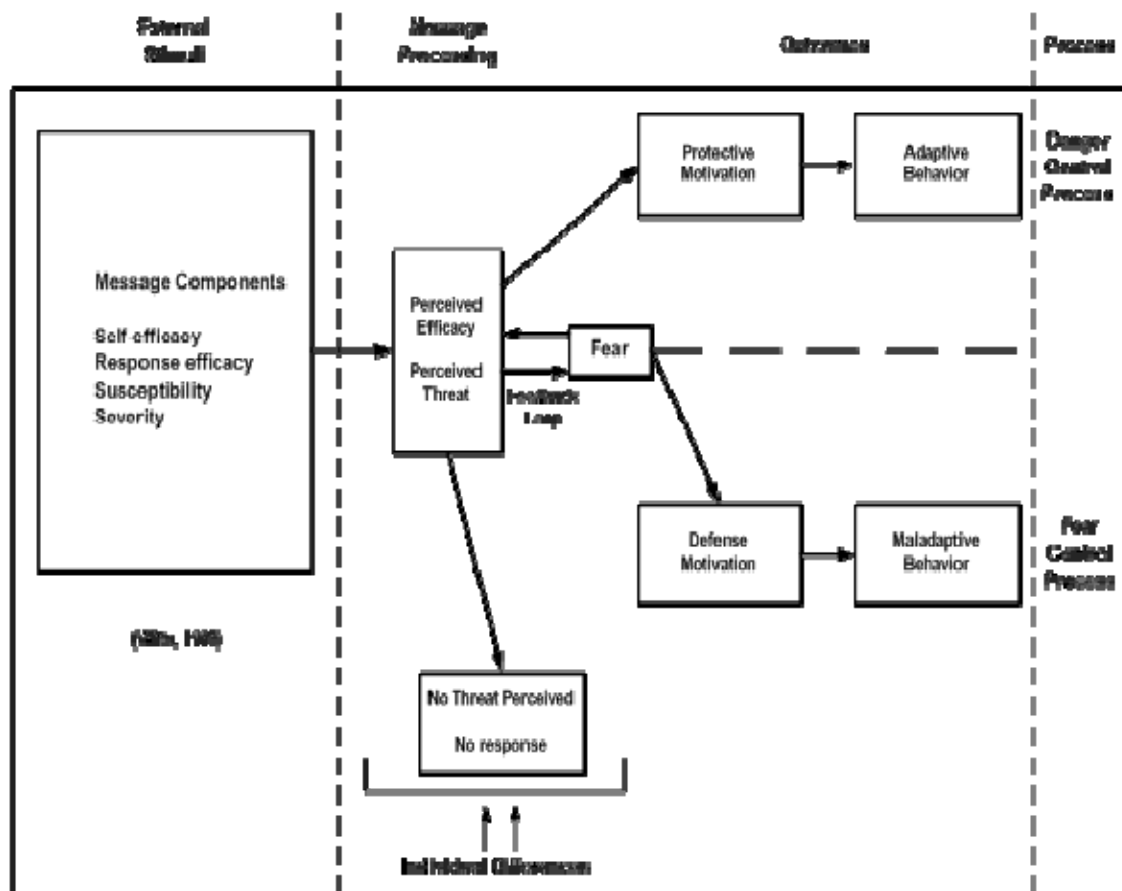


Figure 8. Extended Parallel Process (from Witte, 1998)

Figure 8 also shows the role fear plays in creating a feedback loop into the assessment of the threat and influencing further threat perceptions. As a central aspect of her theory, Witte (1992) contends that upon perception of a threat, fear will feed back into the threat perception. This heightened threat appraisal will motivate the person to take action, either adaptive or maladaptive, in order to reduce their feeling of being “scared” (Witte & Allen, 2000). Thus, fear directly causes maladaptive behavior and indirectly *influences* adaptive behavior by intensifying the perceived threat (Witte, 1992).

The term *maladaptive* behavior was later dropped from the Extended Parallel Process Model, as Witte believed that in some instances fear control behavior was indeed adaptive. Such a case would be a situation where an individual found themselves in a highly threatening situation, which could not be avoided. In this instance, a fear response may be the most effective way to cope (Witte, 1998). Following this change, in lieu of maladaptive behavior, fear control processes implied appeal message rejections “in the form of defensive avoidance, reactance or denial” (Witte). Within this work, that change is recognized and the term *maladaptive* is used simply to differentiate defensive avoidance fear control behavior from adaptive danger control process behaviors.

The three potential behavior outcomes resulting from the EPPM can be displayed diagrammatically, as shown in Figure 9. As shown in the upper right of the diagram, if the threat and efficacy perceptions are deemed high (HT/HE) the individual will undertake danger control processes, which consist of adaptive behaviors. If the threat is perceived to be high and the efficacy perceived to be low (HT/LE) as shown in the upper left corner, the individual will undertake fear control processes, which consist of maladaptive behaviors. Should the threat be evaluated as low, the behavior outcome will be an ignoring of the fear appeal message, regardless of whether the efficacy is perceived to be high or low (LT/LE or LT/HE), as illustrated in lower right and left corner of the diagram.

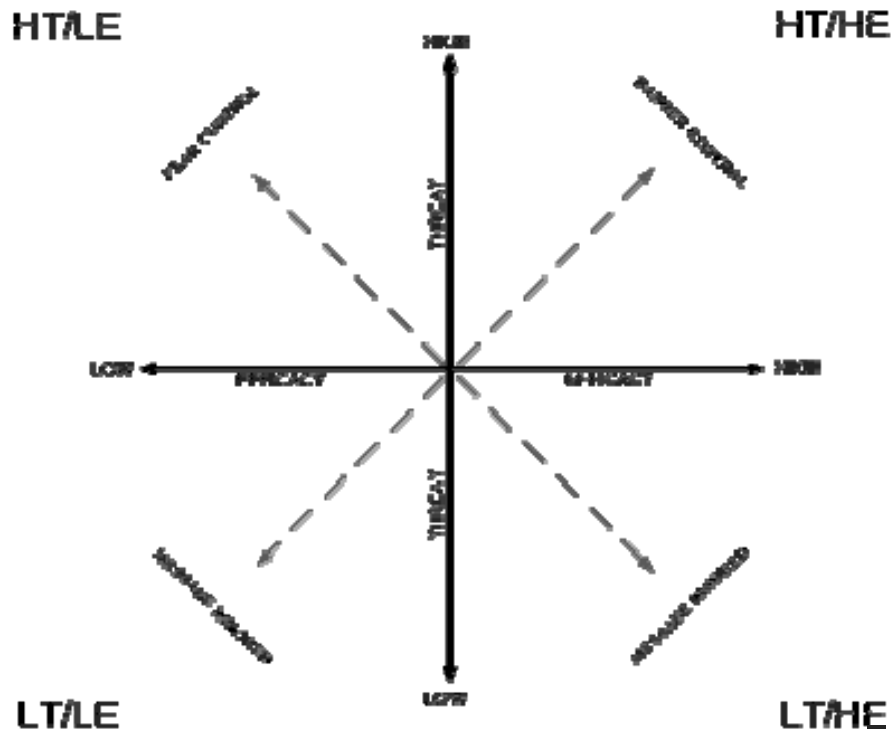


Figure 9. Three Fear Appeal Behavior Outcomes

4. Application of the Extended Parallel Process Model

The Extended Parallel Process Model has been utilized in multiple studies seeking to measure its efficacy in behavior change. Social issues, such as HIV/AIDS (Witte, 1992, 1994; Witte & Morrison, 1995), genital warts (Witte, Berkowitz, Cameron, & McKeon, 1998a), hearing loss in coal miners (Murray-Johnson et al., 2004) and skin cancer (Stephenson & Witte, 1998) have been the subject of Extended Parallel Process studies. Additionally, the model has been utilized as a theoretical framework for health behavior campaigns such as tractor safety (Witte et al., 1993), Radon awareness (Witte et al., 1998b), teenage pregnancy (Witte, 1997), and HIV/AIDS in Africa (Witte, Cameron, Lapinski & Nzyuko, 1998).

The *Citizen Corp Personal Behavior Change Model for Disaster Preparedness* model (PDPM) advocates utilizing the Extended Parallel Process Model (EPPM) to guide development of preparedness messages that cater to the threat appeal aspect of behavior.

Acknowledging the low levels of civilian preparedness, determining if the PDPM's use of the Extended Parallel Process model is the most effective means to motivate people to prepare takes on added importance. Will preparedness messages that utilize fear appeals provide the sought after results?

The PDPM model divides individuals who do not prepare into four groups:

1. Persons who do not believe that they are susceptible to the threat (e.g., It is unlikely that a terrorist attack will happen where I live).
2. Persons who do not believe that they are presented with a severe threat (e.g., I don't feel like my life would be really in danger if a terrorist attack occurred in my city).
3. Persons who do not know what the recommended actions are or does not believe that they can perform the recommended protective actions (e.g., I don't know how to protect myself from a dirty bomb).
4. Persons who do not believe that the recommended protective actions will be effective (e.g., Nothing I do will help me survive a terrorist attack with a dirty bomb).(ORC Macro, 2006)

These four groups represent the four behavior variables integral to the Extended Parallel Process; threat susceptibility, threat severity, self-efficacy and response efficacy.

The model further segments individuals into three threat/efficacy profiles that closely follow the three possible fear appeal behavior outcomes illustrated in Figure 9. The first profile group is made up of individuals who are “unaware or dismissive of threat because of perceived low susceptibility, urgency and/or severity” (ORC Macro, 2006). These individuals fall into the two low threat (LT) portions of the matrix, which results in ignoring of the message (Figure 9) This profile group is characterized by the PDPM as being “unreceptive to preparedness messages.” Developers of the model added “urgency” to the PDPM as they felt that the timing of a disaster was unpredictable and would play a role in determining motivation to prepare (ORC Macro).

The second profile group is for the individual who “understands susceptibility to, and severity of, threat, yet perceives varied barriers to preparedness behaviors” (ORC Macro, 2006). Referring back to Figure 9, these individuals would be in the high threat

and low efficacy (HT/LE) portion of the matrix and exhibit non-productive, coping fear control behaviors. The PDPM characterizes this group's behavior as "unprepared" (ORC Macro, 2006).

The last PDPM profile group "understands threat and has high belief in self and response efficacy" (ORC Marco, 2006) and would be represented by the high threat/high efficacy (HT/HE) region of the matrix shown in Figure 9. The adaptive danger control behavior exhibited by this region corresponds to being characterized by the PDPM as "prepared" (ORC Macro).

5. Analysis

In 2007, the Federal Emergency Management Agency's (FEMA) Community Preparedness Division and Citizen Corp conducted a survey, which included questions to test the PDPM's constructs involving severity/efficacy and risk awareness/perception. The survey examined preparedness levels for natural disasters, terrorism, a hazardous materials accident and a disease outbreak. The survey findings offered a mixed review of the accuracy of the PDP and the underlying Extended Parallel Process model. Preparedness behaviors for natural disasters and hazardous materials accidents were directly related to levels of perceived susceptibility and severity. According to the Federal Emergency Management Agency, "People who held stronger beliefs and perceptions about the severity, urgency, and susceptibility were also more likely to rate themselves as being or becoming prepared for a disaster" (Federal Emergency Management Agency [FEMA], 2009). Survey results for terrorism and a disease outbreak, however, demonstrated an inverse relationship between the perceived threat and levels of preparedness. Respondents with "higher perceived severity" were associated with "less preparedness" (FEMA). The FEMA report suggested that "if perceived severity reaches a certain threshold, the perception of threat may no longer motivate preparation and countermeasures, and may instead deter preparedness behavior" (FEMA). The added variable of urgency was found to not predict preparedness and the report suggested removing it from the PDPM (FEMA).

A later survey, completed in 2008, also indicated that perceived risk may not be an accurate motivator for preparedness. That study, completed by the National Consortium for the Study of Terrorism and Responses to Terrorism (START), surveyed 3300 Americans across 48 states and produced a picture that challenges the PDP model and the use of fear appeals (Kano, Wood, Mileti & Bourque, 2008). The findings indicated that there was no relationship between the perceived risk of a catastrophic event (fear inducing) and levels of citizen preparedness (Kano et al., 2008). Kano et al., explained, “Perceived risk fell out of all predictive models” and “receiving increased probabilities” for events doesn't increase public readiness actions. It is apparent that a majority of Americans do perceive the risk of terrorism, as a National Center for Disaster Preparedness (National Center for Disaster Preparedness [NCDP], 2006) survey revealed that nearly 82 percent of the public feels that the United States will experience more terror attacks in the future. The conclusion from START's study, however, is that citizens are not being motivated to protect themselves by the fear of such a catastrophe.

The perception of threat and its associated fear may, in fact, have upper limits on its motivational effectiveness. In *Air Wars and Emotional Stress*, Janis (1951) warned that civil defense communications needed to be carefully designed so as to not raise the level of fear to a point where the public would potentially be disinclined to accept the preparedness communication. Fear appeal theories, such as the Extended Parallel Process, which dismiss Janis's inverted u-shape fear/motivation relationship, posit that the more fear the better, as long as appropriate and effective coping behavior recommendations accompany the fear appeal. The FEMA (2009) findings for terrorism and disease outbreaks may contradict those belief holdings. FEMA's report indicated that “perceived extreme severity may deter people from preparing and, therefore, there may be a “severity threshold” relevant to disaster preparedness that renders the severity component of the Extended Parallel Process Model problematic for this particular set of threats” (FEMA, 2009).

Based on the FEMA (2009) and START (Kano, Wood, Mileti & Bourque, 2008) surveys, will utilizing the fear appeal messages advocated by the Extended Parallel Process Model provide the motivation to prompt preparedness behaviors? According to

Soames Job (1988) in the article “Effective and Ineffective Use of Fear in Health Promotions Campaigns,” there are multiple criteria necessary for a fear appeal campaign to be successful. The five criteria described were:

1. Fear onset should occur before the desired behavior is offered;
2. The event upon that the fear is based should appear to be likely;
3. A specified desired behavior should be offered as part of the campaign;
4. The level of fear elicited should only be such that the desired behavior offered is sufficient to substantially reduce the fear; and
5. Fear offset should occur as a reinforcer for the desired behavior. (Soames Job)

Soames Job (1988) suggested that it is very difficult to ensure that all five of these criteria are being met with each appeal. Utilizing ineffective fear appeal campaigns could result in a detrimental result to the overall outcome and not achieve the desired behaviors (Soames Job). Determining when the upper threshold of fear is exceeded is very difficult according to Witte (1998). Measuring fear is not an exact science and, as Witte concedes (1998), “until we develop more sophisticated measures of fear arousal, testing some aspects of the EPPM will remain difficult.” As the FEMA (2009) survey indicates that the fear associated with terrorism and disease outbreaks may approach extreme and unproductive levels, there exists the potential to create an ineffective preparedness campaign when focusing inappropriate levels of fear arousal on these events.

Determining exactly what will be perceived as fearful is problematic, as well, when attempting to utilize fear in an appeal. As Witte (1998) points out, the developer of a health campaign fear appeal may formulate a message and assume that the depicted threat will elicit a fear response. She provides an example of this in her work, *Fear as Motivator, Fear as Inhibitor: Using the Extended Parallel Process Model to Explain Fear Appeal Successes and Failures* (Witte):

For example, Witte (1997) discovered in focus group research that teen girls did not view “getting pregnant” as a threat or negative consequence of sexual intercourse. According to these teens, far greater threats were “getting fat” or “losing friends.” Thus, the teens suggested that an

effective pregnancy prevention fear appeal should threaten loss of friendship or weight gain as a consequence of sexual intercourse leading to pregnancy. Overall, to develop effective fear appeals, researchers must determine carefully what is scary or threatening about a defined topic for a specific target audience.

LaTour (2006), speaking in the context of fear arousal in advertising, questions whether practitioners are fully aware of the differences in perceiving fear. He cites individual differences, as well as, cultural differences as possible reasons fear appeals and subsequent fear arousals do not evoke universal responses. Further research needs to explore the effects of cultural-conditioning, such as child-rearing and even evolution have on an individual's cognitive processing of fear (LaTour).

Additionally, it has been suggested by some researchers that there has been misinterpretation of the fear appeal research results. Hastings, Stead and Webb (2004) contend that the neat, orderly outcomes of laboratory test results do not necessarily translate into similar results in a complicated, disorderly real world. They listed four reasons for this lack of outcome correlation:

1. Fear studies have been performed in artificial environments;
2. The definitions of fear used are sometimes unclear and the measures of effects are limited;
3. Narrow or inappropriate samples have often been used; and
4. There are few publicly available studies that have examined real advertising campaigns that use fear appeals. (Hastings et al.)

Thus, as promising as they appear in studies, fear appeals may not yield the same positive results in the real world as witnessed in the laboratory. Additionally, research subjects are typically college age students and not necessarily representative of the wider population at large. As such, the outcomes witnessed during studies may not translate into real world achievements (Hastings et al., 2004).

Finally, there is the prospect that the effects one sees in individuals exposed to long-term fear conditions may be acting similarly upon recipients of long-term fear appeal campaigns. The effects of long-term repetitive exposure to fear appeals have not

been examined. As constant exposure to fearful situations may promote habituation, repeated exposure to repetitive fear appeals, such as in preparedness campaigns, may result in a reduction of their effectiveness. Hastings et al. (2004) warn that repeated fear appeal messages in campaigns “may lead to habituation, annoyance, and an increased tendency for individuals to tune out the message.”

B. THE TRANSTHEORETICAL MODEL

1. Development of the Transtheoretical Model

In the early 1980s, Prochaska and DiClemente set out to develop a new theory, which addressed the issue of smoking cessation (Burkholder & Nigg, 2002). Their theory, named the Transtheoretical Model (TTM), sought to combine multiple theories of change and utilize several therapy modalities (see Figure 10). According to the theory, people make decisions to change after they have weighed the costs and benefits of both the change itself and the maintenance of those changed behaviors (Morera et al., 1998). This component was derived from earlier work and research by Janis and Mann (1977). The TTM is also considered to be a multi-dimensional model as its theory incorporates:

1. Movement through several stages of change
2. Independent variables, such as the processes of change
3. Dependent variables, such as the decisional balance and self-efficacy
4. Outcome measures. (Morera et al., 1998)

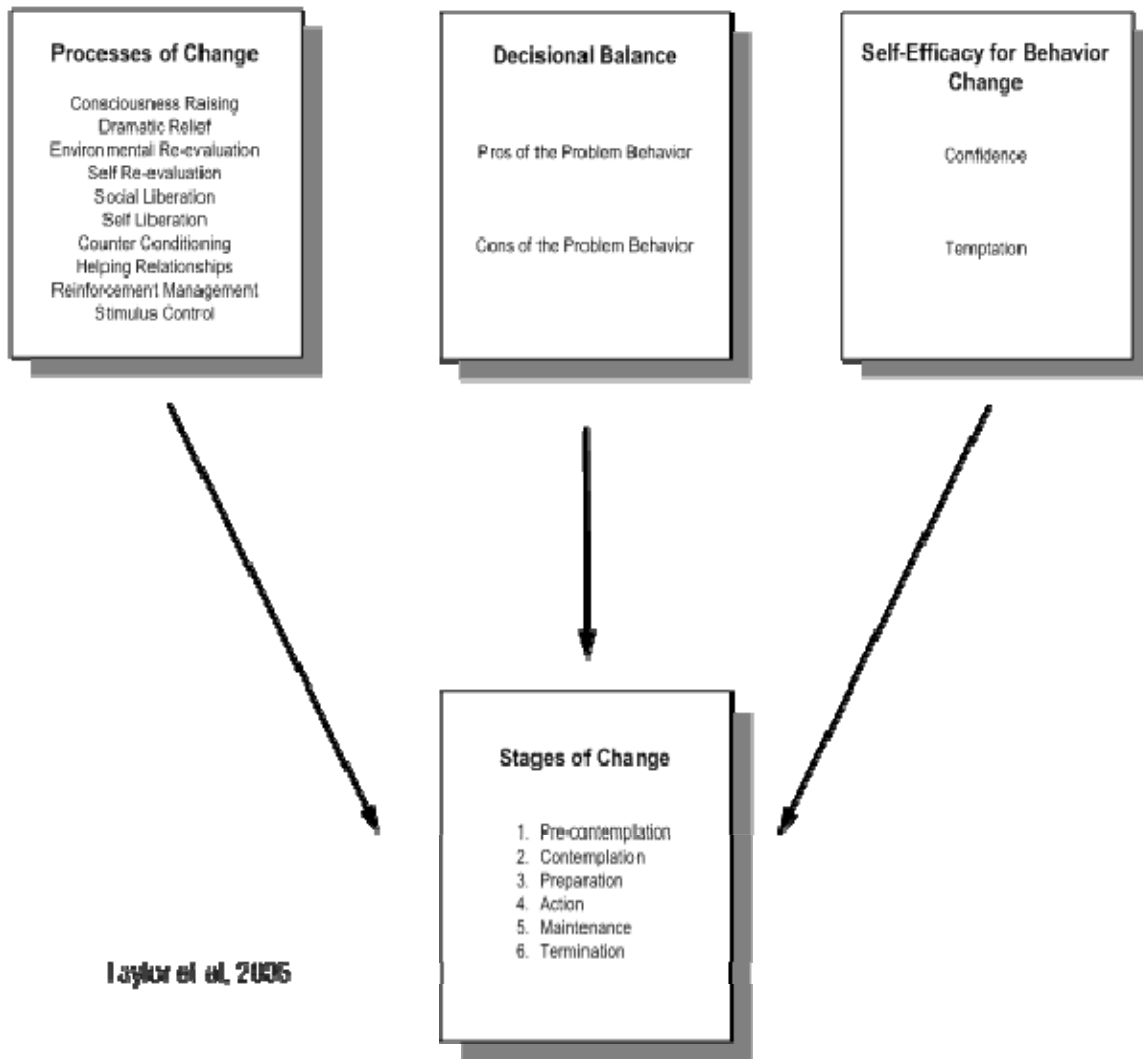


Figure 10. The Transtheoretical Model (from Taylor et al., 2006)

The theory takes its name from the fact that it incorporates “cognitive, motivational, social learning and relapse theories” (Morera et al., 1998). In developing their theory, Prochaska and DiClemente (2002) laid out a set of criteria that their new theory needed to meet:

1. It needed to be empirical (measurable and validated)
2. It needed to explain what motivated people to change, as well as, explain why they did not change.
3. It needed to be applicable across a broad range of problems.

4. It needed to help achieve success among potential killer behaviors, such as smoking, diet and drinking addiction.
5. The model needed to be addressable to both behavioral and mental health issues.
6. The models needed to be diverse enough to allow innovative therapist room to vary their approaches.

Emphasizing the multi-dimensional approach to therapy, the model recognizes and identifies the 10 most common processes that individuals utilize when changing behaviors. As defined by Prochaska and DiClemente (2002), processes are “cognitive actions or activities that people engage in to alter thinking, effect, behaviors or relationships.” The 10 processes recognized are:

1. Consciousness raising
2. Dramatic relief
3. Self-reevaluation
4. Environmental reevaluation
5. Self-liberation
6. Social liberation
7. Counter conditioning
8. Stimulus control
9. Reinforcement management
10. Helping relationship (Prochaska and DiClemente)

Noting that most therapy systems emphasized only one or two of these processes, Prochaska and DiClemente (2002) wanted to provide a therapy model, which was as diverse and complex as their patients. Their work with other therapists revealed that therapists applied different change processes depending upon which “stage” of change they felt their patients were at (Prochaska and DiClemente). Through their research, they posited that behavior change occur over six distinct stages (Prochaska and DiClemente). These stages are:

1. Precontemplation
2. Contemplation
3. Preparation
4. Action
5. Maintenance
6. Termination (Prochaska and DiClemente)

Prochaska and DiClemente (2002) described these stages as a “middle level abstraction between personality traits and psychological states.” The characteristic of a stage, as they describe them, are that they are relatively stable over time but are open to change. Behavioral problems share a similarity with these stages, as they are also stable over time, yet open to change (Prochaska & DiClemente).

Figure 11 illustrates how the six stages are arranged. The order of progression from Precontemplation to Termination is a function of time and moves from left to right. The first stage of change, Precontemplation, is one where an individual has no intention to change. The issue with people at this stage is not that they are resistant to making a change, it is that they are not aware of the problem that requires the change. “As G. K. Chesterton once said, “It isn’t that they can’t see the solution; it is that they can’t see the problem” (Prochaska & DiClemente, 2002). In the case of a smoker, someone in the Precontemplation stage has never entertained thoughts of quitting, as they see no problem with the smoking behavior (Morera et al., 1998).

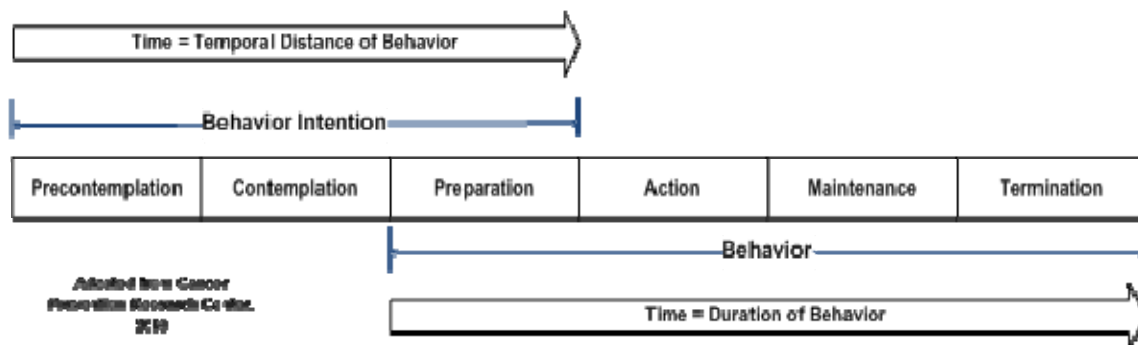


Figure 11. Transtheoretical Stages of Change (after Cancer Prevention Research Center, 2010)

It is typically outside pressure from family and friends that propels these individuals to seek help for their problem (Prochaska & DiClemente, 2002). Creating an awareness of the problem, with its associated risks and benefits, are the goals of interventions at this stage (Clarke, 2002). Individuals at the Precontemplation stage “process less information about their problems, spend less time and energy reevaluating themselves” (Prochaska & DiClemente). The intervention at this stage is make the “individual more aware of the problem and overcome their active resistance to change” (Clarke). Most traditional intervention models are not designed to address these individuals (Cancer Prevention Research Center, 2010).

Contemplation is the next stage of change described by the model. Individuals at this stage have an awareness of their problem and are seriously weighing the pros and cons of making a change (Clarke, 2002). According to Prochaska and DiClemente (2002), individuals in this stage have not yet made the commitment to make the change and can become “stuck” at this stage for relatively long periods of time. As told by Prochaska and DiClemente (2002):

The essence of contemplation is communicated in an incident related by Benjamin (1987). He was walking home one evening when a stranger approached and asked him the whereabouts of a certain street. Benjamin pointed it out and provided specific directions. After understanding and accepting the instructions, the stranger began to walk in the opposite direction. Benjamin said, “You are headed in the wrong direction.” The stranger replied, “Yes, I know. I am not quite ready yet.” This is contemplation: knowing where you want to go, but not being quite ready yet to go there.

Motivation to make specific plans to affect change is a goal at the Contemplation stage. Assisting individuals with researching alternatives to their behavior, as well as, identifying the costs and benefits of change will promote movement towards action (Clarke, 2002).

Once an individual has decided to try to make a change, they move into the Preparation stage. It is at this stage that the individual attempts to put the necessary pieces together that are required for action. At this stage, they have made a commitment to act and are planning how they will do so. In many instances, people in the Preparation stage

will share their desire to change with others around them (Clarke, 2002). The model adds the clarifier that the desire to act must occur within 30 days (Clarke). Once a decision to act has been made, the individual at the Preparation stage requires assistance in developing action plans and goals (National Cancer Institute, 2002).

The actual making of a change marks arrival at the Action stage. It is at this stage “at which individuals modify their behavior, experiences and/or environment to overcome their problems” (Prochaska & DiClemente, 2002). In our example of a smoker, it is at this stage that they would actually quit smoking (Morera et al., 1998). To be considered within this stage, individuals must have successfully changed their problem behavior for a period between one day and one month (Prochaska & DiClemente). The Action stage is marked by the actual performance of a behavior change. Intervention at this stage is characterized by “feedback, problem solving, social support and reinforcement” (National Cancer Institute, 2002).

Following the Action stage is Maintenance. This stage marks the period in which an individual develops the skills and strategies with which to enable them to continue their behavior change (Clarke, 2002). As described by Prochaska and DiClemente (2002), “Maintenance should not be viewed as static; rather it is a continuation, not an absence, of change.” The time period for this stage is considered to be a change of behavior continued for at least six months; however, for some chronic addictive behaviors, this stage could last throughout an individual’s life time (Prochaska & DiClemente). Providing an individual with reminders, support, alternative plans and assisting with coping strategies are interventions useful at the Maintenance stage.

The final stage is considered Termination. It is at this stage where the problem behavior has been extinguished and the urge to engage in the behavior no longer exists (Prochaska & DiClemente, 2002). Clarke (2002) outlines four criteria that must exist for one to be considered at the termination stage:

1. The individual has a new self-image.
2. The individual experiences no temptation in any situation.

3. There is solid self-efficacy.
4. The individual is enjoying a healthier lifestyle.

In the case of an addiction, individuals at this stage of change would be considered to have “recovered.” (Prochaska & DiClemente)

These six stages of change should not be looked at as a linear process; rather, it has been described as a spiral process (see Figure 12). Individuals may progress through the stages sequentially, as if walking up a spiral staircase; however, they can step off onto other steps, or stages, along their change journey (Prochaska & DiClemente, 2002). Individuals may move back and forth between stages before they eventually move to the Maintenance and Termination stages (Block & Keller, 1998). It is impossible, however, to return to the Precontemplation stage after it has been passed through. Once a problem has been acknowledged, one cannot regress back to an unaware or Precontemplation stage (National Cancer Institute, 2005).

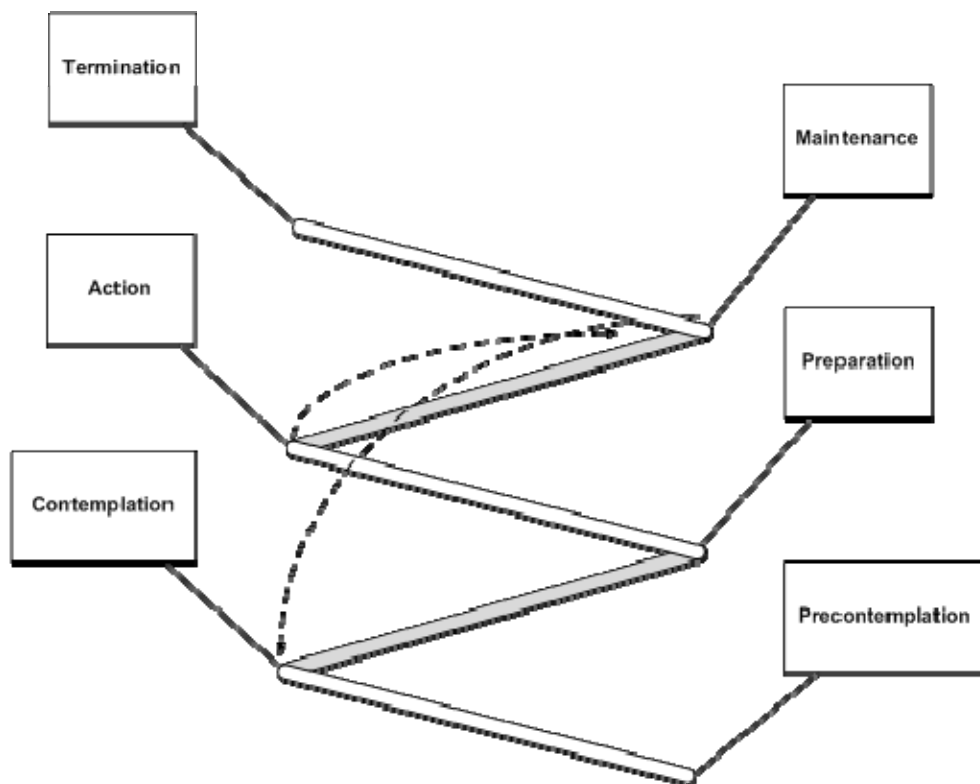


Figure 12. The Spiral Process of TTM

Relapse is a regressive situation, addressed in the TTM as the condition where an individual steps back into an earlier stage. This is most apt to occur during the Maintenance stage (Prochaska & DiClemente, 2002). It is considered the rule, rather than the exception with most chronic behaviors (Prochaska & DiClemente). These individuals who relapse may linger at the Contemplation stage for long periods of time as they deal with embarrassment and a sense of failure in not maintaining their change decision (Prochaska & DiClemente). The theory does hold, however, that these individuals learn from their relapses and adapt their future approaches to change on these lessons (Prochaska & DiClemente).

Therapists have several tools available to them to determine the stage level an individual is at or which change process they are utilizing at a particular stage. The University of Rhode Island Change Assessment is a self-report measure, which can identify the change stage of an individual. The Process of Change Measure is another self-report tool, which can be used to determine the change process being used by an individual. Once a level of stage has been identified, the therapist can begin to design their interventions (Prochaska & DiClemente, 2002).

2. Application of the Transtheoretical Model

The Transtheoretical Model has been utilized across a wide range of behaviors. The TTM has been studied in conjunction with exercise behavior (Burbank, Reibe, Padula & Nigg, 2002; Burkholder & Nigg, 2002; Marshall and Biddle, 2001), pregnancy and STD prevention (Horowitz, 2003), eating behaviors (Horwath, 1999; Wilson & Schlam, 2004), HIV prevention (Prochaska et al, 1994), breast cancer screening (Rakowski, Dube & Goldstein, 1996), sexual abuse (Corcoran, 2002) and smoking cessation (Cancer Prevention Research Center, 2010; Cole, 2001; Prochaska & Velicer, 2004; Sutton, 2000b).

The Citizen Corps PDP Model incorporates the Transtheoretical model along with the Extended Parallel Process as shown in Figure 13. The three threat profiles previously described in Section 4, which represent the EPPM threat/efficacy outcomes, are represented by three vertically stacked circles on the left side of the model. Directly

across the chart on the right hand side, the Transtheoretical stages are represented by the downward orientated arrow. The TTM stage of Precontemplation starts at the top of the arrow and the achieving of behavior change would be shown as movement downward along the arrow. The lowermost box is used to represent the Maintenance stage of preparedness behaviors, which is the ultimate goal of the PDP model.

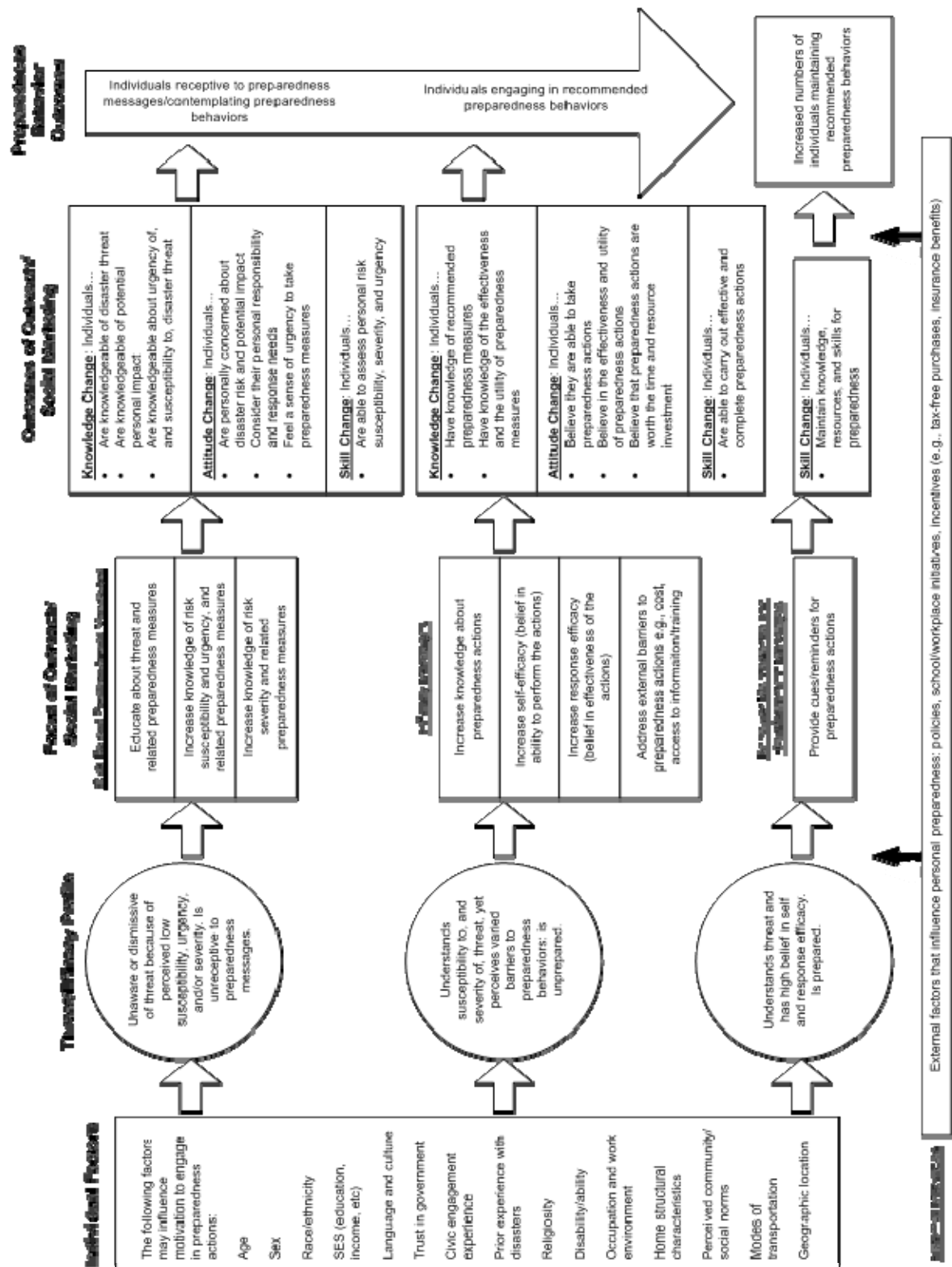


Figure 13. The Personal Behavior Change Model for Disaster Preparedness (from ORC Macro, 2006)

The model layout infers that the threat/efficacy profile of low threat aware individuals is aligned with the Precontemplation and Contemplation stages of the Transtheoretical model. Likewise, those individuals who have a perception of threat yet lack the efficacy portion (HT/LE), would line up against the Contemplation / Preparation stage of the TTM. The last profile group, shown as the lowermost circle on the chart, represents those people who have a high level of perceived threat and perceived efficacy (HT/HE). According to the PDP model, these individuals would align with the action and maintenance portion of the Transtheoretical model. Positioned between the three threat/efficacy profile groups and the arrow of Transtheoretical stages, are the outreach/social marketing methods and expected outcomes. These areas of the PDP model will be discussed in Chapter III.

3. Analysis

The wide usage of the Transtheoretical Model should not be confused with wide acceptance. There has been much controversy over its effectiveness and validity. Farkas et al. (1996) cited that in their study of smoking cessation, the Stages of Change model was not a significant predictor of future cessation. A prediction model based on smoking habits predicted smoker cessation at greater accuracy than did the Stages of Change model.

West (2005a) advocated for a complete abandonment of the theory, in lieu of developing alternative models. He explained that the basic concept of “stage” is flawed. He describes the TTM’s time frame parameters for determining stages as “arbitrary dividing lines.” He uses an example of a smoker who would be classified in the preparation stage if he were planning to stop smoking within the next thirty days. That same smoker, he explained, would be considered to be at the contemplation stage if his plan was to quit on the thirty-first day. He believes that utilizing time frames as stage delineators is problematic and “apart from those individuals that set a specific occasion or date for change (e.g., in a New Year’s resolution), intentions about change appear to be much less clearly formulated” (West, 2005a).

Etter (2005) did not agree that specific stage-related interventions are necessary. He reported that “it has never been convincingly shown that distinct strategies are needed to progress across distinct stages” (Etter). He references studies (Dijkstra et al., 1998; Quinlan & McCaul, 2000) that showed mismatched interventions applied to smokers at various stages, including precontemplators, were as effective and, in some instances, more effective than stage-matched interventions (Etter).

Sutton (2005) evaluated the model, its assessment instruments and data from its use and concluded “that the TTM cannot be recommended in its present form” and researchers needed to “go back to the drawing board.” He wrote, “discarding the TTM does not necessarily mean abandoning the idea that behavior change, including smoking cessation, involves movement through a sequence of discrete stages” (Sutton). Two alternative models, the Precaution Adoption Model and the Perspectives on Change Model, were offered up as two promising alternatives (Sutton).

The 2009, FEMA *Personal Preparedness in America* survey findings provided support, overall, for using the Transtheoretical model within the PDP model. As stated in FEMA (2009), “Stages of Change was positively correlated with self-reported, objective preparedness (referred to as readiness for clarity purposes above), meaning the more preparedness actions people say they have taken, the further along they are in Stages of Change.” However, the alignments of threat/efficacy profile groups and the Stages of Change model “revealed an inconsistency in the way the constructs relate to self-reported preparedness actions” (FEMA). As previously discussed in Section 3, the PDP model constructs correlated well with the survey results when limiting the data to natural disasters and hazardous material accidents. The data associated with terrorism and disease outbreaks did not correlate to the model constructs.

The FEMA report indicated a need to reexamine the PDP model related to preparedness due to the large number of people who indicated that they were “prepared for at least the past 6 months” (FEMA, 2009). According to the Transtheoretical model, an individual who is performing the recommended behavior for a period between one and six months is considered to be in the Maintenance stage. This unusually large reporting group may be due, as reported by FEMA (2009), to the use of the term “preparedness,”

which does not enjoy a universal definition. The report utilizes survey results as evidence of the potential misconception of the meaning of “prepared” (FEMA). Of all respondents who had indicated that they were prepared, “40 percent did not have a household plan, 80 percent had not conducted a home evacuation drill, and nearly 60 percent did not know their community’s evacuation routes” (FEMA).

III. DISASTER PREPAREDNESS BEHAVIOR CHANGE

A. CITIZEN CORP PERSONAL BEHAVIOR CHANGE MODEL

1. Overview of Model

In the fall 2006 issue of *Citizen Preparedness Review*, a program model for citizen preparedness change was outlined (ORC Macro, 2006). This model, called the *Citizen Corp Personal Behavior Change Model for Disaster Preparedness* (PDP Model), examines the various factors that effect an individual's decision to prepare for disasters and then groups those individuals into three threat/efficacy profiles. Those profile groups are identified as:

1. Individuals who do not perceive a threat or susceptibility to a threat,
2. Individuals who do perceive a threat or susceptibility but perceive barriers to preparedness activities, or
3. Individuals who understand the threats and actively participate in preparedness activities. (ORC Macro, 2006)

The PDP model lays out a three-tiered approach to community outreach and social marketing that would likely appeal to each group:

1. A risk-based preparedness program that provides educational messages about the threats, susceptibility to threats and the threat related preparedness activities or measures one would take to mitigate those threats.
2. Efficacy messages, which would increase knowledge in the efficacy of preparedness measures, as well as, address other barriers to preparedness such as cost, time, etc.
3. Behavior maintenance and reinforcement of preparedness activities currently being taken. (ORC Macro, 2006)

It is suggested that any preparedness program following this model should result in changes to individual levels of knowledge, attitudes and beliefs in preparedness and skills related to preparedness activities. The final preparedness behavioral changes should

result in individuals who are more receptive to preparedness messages, would consider taking action towards preparedness and who would begin to engage in actions that will increase personal preparedness.

A recent public service announcement released by Ready.gov, titled World Upside Down, demonstrates the practical use of the fear appeal (USDHS, 2009). The video depicts a family quietly relaxing at home when suddenly their house is shown turning upside down in slow motion. As the announcer asks, “what if everything familiar becomes anything but”, viewers are shown the family slowly tumbling along with their all of their furnishings and belongings. As the home completes its rotation and settles in an upside down position, the father grabs a duffle bag from beneath a table. As the announcer states, “before a disaster turns your family’s world upside down, it’s up to you to be ready,” the father calmly leads his family out of the building. The video ends with the message, “Get a kit, make a plan, be informed” (USDHS). (See Figure 14).

Establishing threat severity and susceptibility, the video conveys to viewers that disasters can strike anyone, at any time and with devastating consequences. The closing image of the father calmly walking his family to safety reinforces the ease (self-efficacy) and effectiveness (response efficacy) of being prepared. According to the announcer, all that is required is to get a kit and make a plan in order to be prepared.



Figure 14. World Upside Down (from USDHS, 2009)

As discussed in Chapter II, the Citizen Corps PDP Model utilizes two distinctly different individual-based behavior change models. The first, the Extended Parallel Process Model, is a fear-appeal theory that applies an equation of variables to predict behavior. This equation, as described by Witte (1998), is made up of a threat, which is considered an external stimulus variable, and efficacy, which she describes as an environmental or message cue. These two factors together will either produce a fear response or danger control. Her theory posits that if the perceived threat is high, the determining factor in which danger/fear process is followed will be the evaluation of the perceived efficacy. A high degree of perceived efficacy will result in a danger control process, which is adaptive and directed at constructively meeting the threat challenge. Conversely, a low perceived efficacy will result in a fear control process, which is characterized by defensive avoidance behavior. This behavior is channeled into controlling the fear response, rather than constructively dealing with the threat. These factors can be depicted in a mathematical formula format. Figure 15 illustrates the fear appeal equation represented by Witte's EPPM.



Figure 15. The EPPM Equation

By superimposing the EPPM fear appeal equation over the first two threat/efficacy groups in the Citizen Corps PDP Model, one can illustrate which of the equation's variables are being emphasized for each group. Figure 15 shows these relationships. Examining the first Threat/Efficacy group, we find individuals who are unaware or dismissive of threats because they have a low perceived threat. The recommended focus or social marketing for this group is shown to be an increasing of the individual's awareness of the threat. Thus, the variable within the EPPM equation to be

emphasized is the perceived threat. By increasing the individual's perception of their susceptibility to a threat and the severity of the threat, the overall perceived threat will be increased and, as posited by Witte (1998), fear will be aroused and fed back into the threat assessment. (See Figure 16).

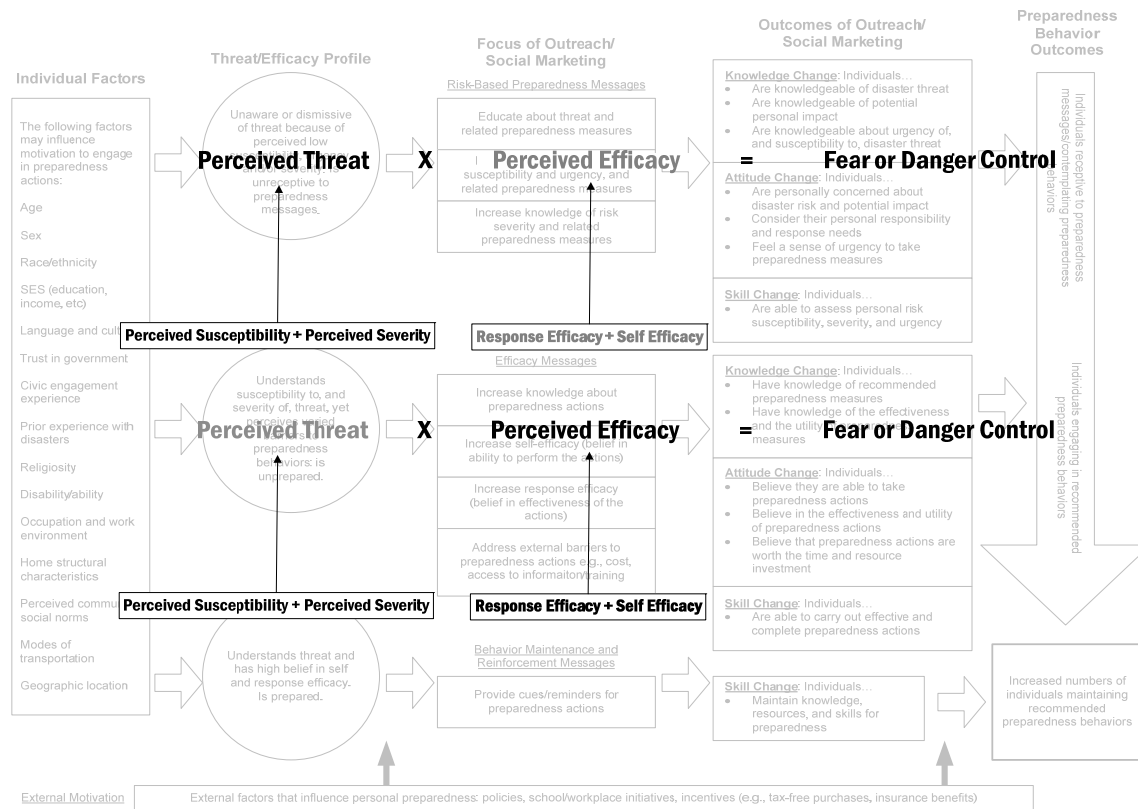


Figure 16. The PDP with Superimposed EPPM Equation

The second Threat/Efficacy profile group understands and acknowledges the threat, but does not possess either the self-efficacy or the response efficacy to undertake preparedness activities. Citizen Corps describes three potential reasons for this low efficacy level (ORC Macro, 2006). The first reason is not accepting that the recommended protective actions would be effective in a time of disaster (response efficacy). Not having faith in the ability to perform the recommended actions (self-efficacy) is the second reason. Finally, individuals may perceive barriers that prevent them from being able to carry out the actions, such as lack of time or money (ORC Macro).

The focus of the outreach or social marketing for this group would be to increase these individual's understanding about preparedness activities, particularly targeting attitudes about self and response efficacy. Additionally, the other barriers that people perceive, such as lack of time or lack of money, need to be identified and focused on with the outreach communication. The factor within the EPPM equation to be emphasized for this profile group is the perceived efficacy. (See Figure 2).

The first profile group aligns with the Precontemplation or Contemplation stages of the Transtheoretical Model, which is the second behavioral theory utilized by the PDP Model. According to the Cancer Prevention Research Center (1998), these stages are characterized by individuals who are not thinking about taking any action within the next six months and those people who are intending to take some action within the next six months, respectively. This use of time is central to the concept behind the Transtheoretical Model, as described by the Cancer Prevention Research Center (1998):

Change implies phenomena occurring over time. However, this aspect was largely ignored by alternative theories of change. Behavior change was often construed as an event, such as quitting smoking, drinking, or over-eating. The Transtheoretical Model construes change as a process involving progress through a series of five stages.

The second Threat/Efficacy profile group aligns with the Preparation stage of the Transtheoretical Model. According to this theory, individuals in the Preparation stage are thinking about performing the suggested activity within the immediate future. The model defines the immediate future as within the next month or thirty days (Cancer Prevention Research Center, 1998).

The final profile group, consisting of individuals who are aware of the threats and have high belief in self and response efficacy, is aligned with the Action and Maintenance stages of the Transtheoretical Model. These stages are characterized by individuals whom have made changes in their behavior and adopted the recommended preparedness activities (Action) and those who are prepared and view preparedness activities as an on-going process (Maintenance) (Cancer Prevention Research Center, 1998).

2. Analysis

Referring back to Figure 15, the EPPM equation for the first profile group emphasizes the perceived threat variable, as this is the stated focus of the model's outreach and social marketing for this group. Witte's (1998) Extended Parallel Process, however, tells us that providing just the threat portion of a fear appeal, without an equalizing efficacy message, will arouse fear and promote a fear control process. This behavior, characterized by defensive avoidance and avoidance of the message, will inhibit further chances to prompt these individuals to act. In fact, Witte (1998) warns, "As perceived threat increases when perceived efficacy is low, people will do the opposite of what is advocated." The Citizen Corps' PDP Model also contains a warning regarding this phenomenon. It states:

To avoid panic or anxiety, risk-based messages should be paired with messages describing actions that can be taken to mitigate the negative consequences of the threat (e.g. appropriate preparedness information and positive encouragement to take action). (ORC Macro, 2006)

This note of caution, in effect, reminds us that a risk-based message, or fear appeal, must have an effective efficacy component if we are to expect a danger control process to dominate. As cautioned above, the absence of such a component will result in fear-based processes dominating (e.g., panic, anxiety). In Chapter II it was shown that this is an essential requirement in the Extended Parallel Process Model. Witte and Allen (2000) provided this same recommendation to fear appeal practitioners, "Strong fear appeals work only when accompanied by equally strong efficacy messages." This recommendation was based on a meta-analysis they performed on more than 100 fear appeal articles. Therefore, in order to avoid fear control processes, the EPPM equation for this profile group needs to equally emphasize both the threat and efficacy factors.

Figure 16 illustrated that the second Threat/Efficacy profile group is characterized by individuals possessing a high degree of threat perception and a low or non-existent belief in efficacy. Again, holding to the validity of fear appeal research, these individuals should be in an active state of fear control processes and, depending on the amount of time they have been in this state, could be a very difficult group to reach. In fact,

FEMA's 2009 Citizen Corps National Survey report suggested "that if perceived severity reaches a certain threshold, the perception of threat may no longer motivate preparation and countermeasures, and may instead deter preparedness behavior" (Federal Emergency Management Agency [FEMA], 2009).

If we were to assume that the degree of threat perceived by this group has not yet reached the threshold that would trigger a fear control response, the Extended Parallel Process theory would tell us that for any risk-based fear appeal message to be effective, a perceived threat component must be added that will trigger the assessment of efficacy (Witte, 1998). As in the first profile group, an effective preparedness message would need to emphasize both the threat component, as well as, the efficacy component. Witte and Allen (2006) cautioned that "weak fear appeals do not promote behavior changes." Thus, the risk-based preparedness message provided to the second profile group would need to emphasize both the threat and protective action and it would look strikingly similar to the one offered to the first threat/efficacy profile group.

With this being the case, is it necessary to profile the two threat/efficacy groups separately if the intervention for each group will be the same? This question highlights the difficulty in attempting to utilize a single motivational behavior-change model as an intervention across a continuum of different change stages. In the case of the PDP Model, both perceived threat and perceived efficacy appear to be required elements in preparedness messages for individuals within all of the five change stages from Precontemplation to Action.

The alignment of each Threat/Efficacy profile group illustrates another difficulty with combining a single motivational theory (EPPM) with continuum-type stages of change models (Transtheoretical Model). As illustrated above, the first Threat/Efficacy profile group needs to receive a balanced preparedness message containing both an effective threat and efficacy component. If we, again, hold to the validity of the Extended Parallel Process Model, providing a risk-based message with both threat and efficacy variables addressed should result in action. Individuals receiving such a message will be moved to accept the recommended preparedness activities as part of the danger control processes. This acceptance of the recommended preparedness activities would then

propel this group of individuals beyond the second threat/efficacy profile group, of who are not yet at the preparation stage, as they still lack efficacy beliefs.

As the Transtheoretical Model organizes the process of behavior change into five distinct stages, each characterized not only by the cognitive degree of progress towards behavior change but also by the amount of time one remains at that progression point, the rapid attitude change prompted by an effective fear appeal is contradictory. An individual, who is completely unaware of a threat (Precontemplation stage), after hearing an effective fear appeal-based public service announcement on the radio, could be at a hardware store purchasing preparedness supplies (Action stage) later that same afternoon. This spotlights the difficulty with utilizing a stage of change model that emphasizes the length of time one must be in a particular stage.

In June 2009, FEMA released the document *Personal Preparedness in America: Findings from the Citizen Corp National Survey*, which documented the results from the 2007 Citizen Corp National Survey (FEMA, 2009). Among the research objectives for the survey was to test the Citizens Corp Personal Behavior Change Model for Disaster Preparedness (PDP). There were several questions included in the 2007 Citizen Corp National Survey that were designed to confirm the model's various constructs (FEMA). The findings from this survey affirmed some and contradicted other predicated outcomes of the PDP Model (FEMA).

The survey examined the threat/efficacy profile breakdown of the survey respondents. The results were distributed among four hazard types: natural disasters, terrorism, hazardous materials accidents and disease outbreaks. For natural disasters, 60 percent of the respondents perceived a low threat of an occurrence affecting them (FEMA, 2009). Seventy-eight percent of all respondents perceived a low threat from a terrorist attack (FEMA). This low perception of threat was exhibited by responses to a hazardous materials accident and disease outbreak, with 72 percent and 79 percent, respectively, of all respondents indicated those feelings (FEMA). These results indict that a majority of respondents did not consider themselves at risk from these four hazard types.

The results for the high threat/low efficacy profile group fairly similar with one notable exception. A low number of respondents perceived a high threat and a low efficacy for terrorism (15 percent), a hazardous materials accident (19 percent) and a disease outbreak (14 percent) (FEMA, 2009). However, when considering a natural disaster, the percentage of individuals who perceived a high threat and a low degree of efficacy jumped to 26 percent (FEMA).

The high threat/high efficacy profile reflected the smallest number of respondents. A natural disaster was the hazard type that received the highest number of responses at 26 percent (FEMA, 2009). The next highest hazard type was a hazardous materials accident with nine percent of the responses (FEMA). Terrorism and disease outbreaks both received the same percentage of responses (seven percent) (FEMA). These results indicate that a very small percentage of people have both a high perception of threat and a high perception of efficacy. As this is the threat/efficacy profile that is predicted to produce prepared citizens, these low numbers indicate that there are only a small percentage of respondents who recognize the risk from some type of disaster and consider themselves capable of taking self-protection measures.

According to the PDP Model, individuals who perceive a low threat will be in the Precontemplation or Contemplation stage of change (ORC Macro, 2006). The survey results, when correlated across the change stages, painted a different picture. Figure 17 displays the percentages of respondents who indicated that they perceived a low level of threat from a natural disaster, terrorist event, hazardous material accident and disease outbreak (FEMA, 2009). The results of the survey portrayed a reverse bell-curve shape. This is counter to the results predicted by the PDP and the underlying Extended Parallel Process Model. According to the EPPM, individuals who do not perceive a threat will not undertake any protective actions (Witte, 1992). The high percentage of respondents who did not perceive a threat, yet claimed to have been prepared for the past six months indicates that there is something other than perception of threat that motivated these respondents to prepare (FEMA, 2009).

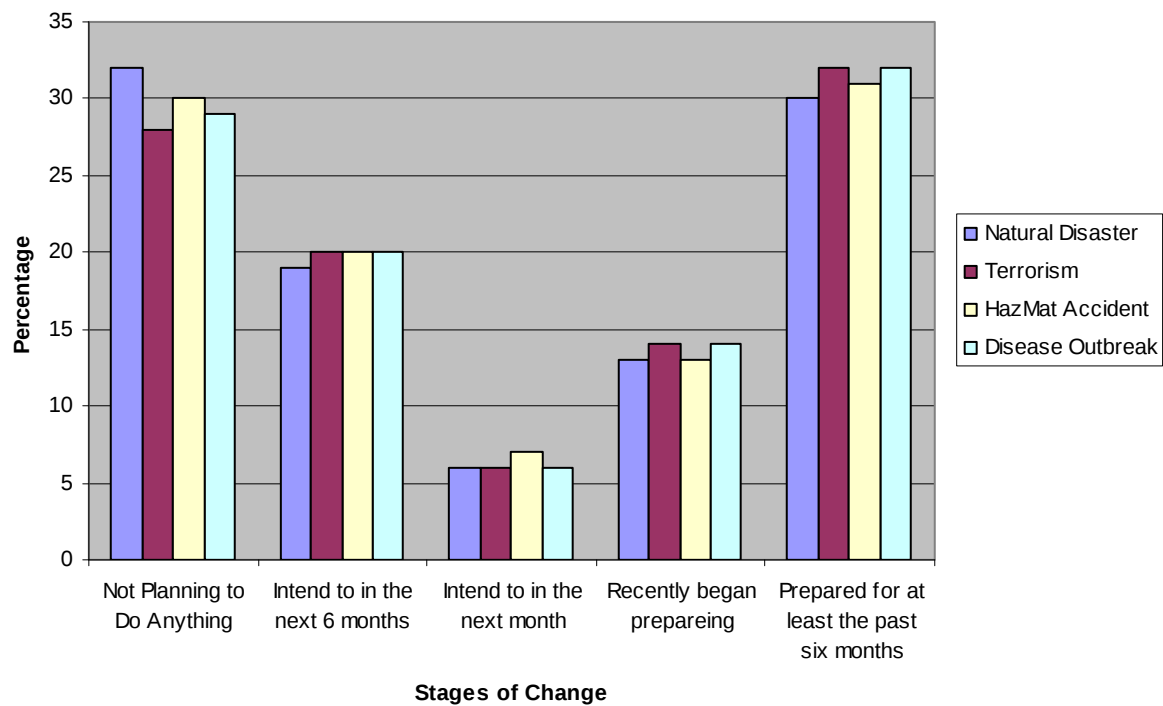


Figure 17. Low Threat Profile Group across SOC (from FEMA, 2009)

The highest correlation of responses to stages of change was in the high threat/high efficacy profile. This profile group is predicted by the PDP Model to represent those individuals who are the most prepared (ORC Macro, 2006). As seen in Figure 18, the greatest percentage of respondents did, in fact, indicate that they had been prepared for the past six months.

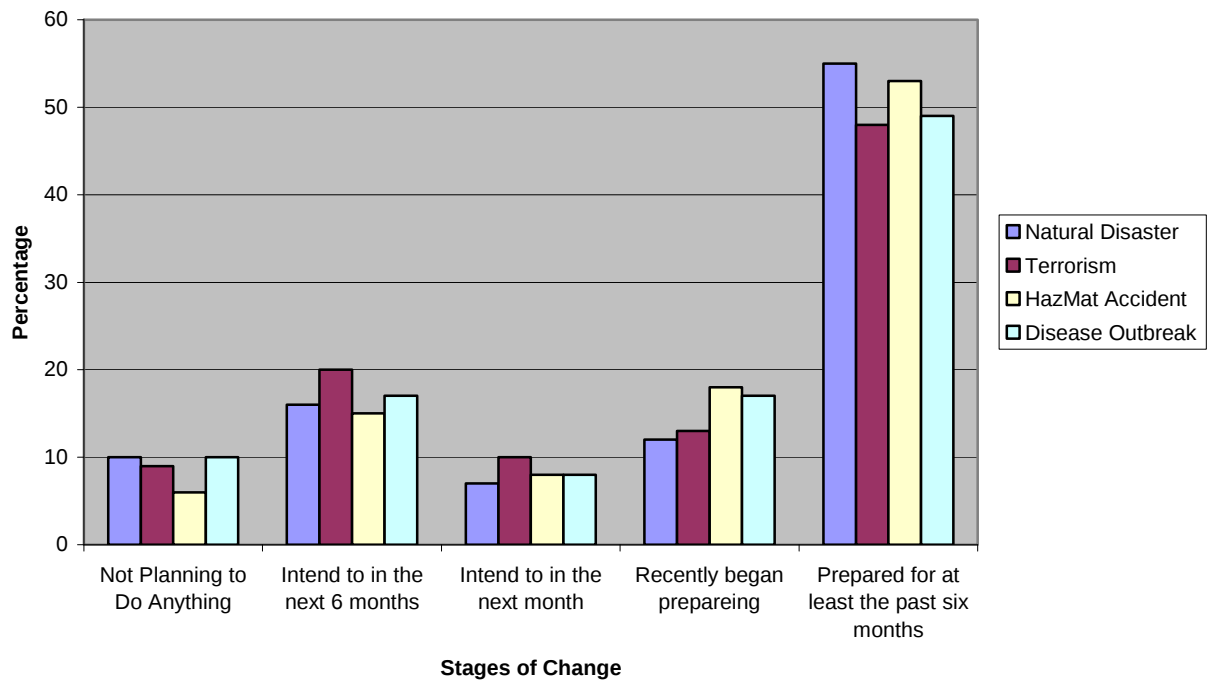


Figure 18. High Threat/High Efficacy Profile Group across SOC (from FEMA, 2009)

The high threat/low efficacy profile group results were mixed. According to the PDP Model, this profile group should be aligned with the preparation stage of change (ORC Macro, 2006). This stage is indicative of an individual who has decided to take action in the near future (within one month). The results from the Citizen Corp survey are shown in Figure 18 and indicate a large number of respondents at the Precontemplation and Contemplation stage, as well as the Action and Maintenance stages (FEMA, 2009).

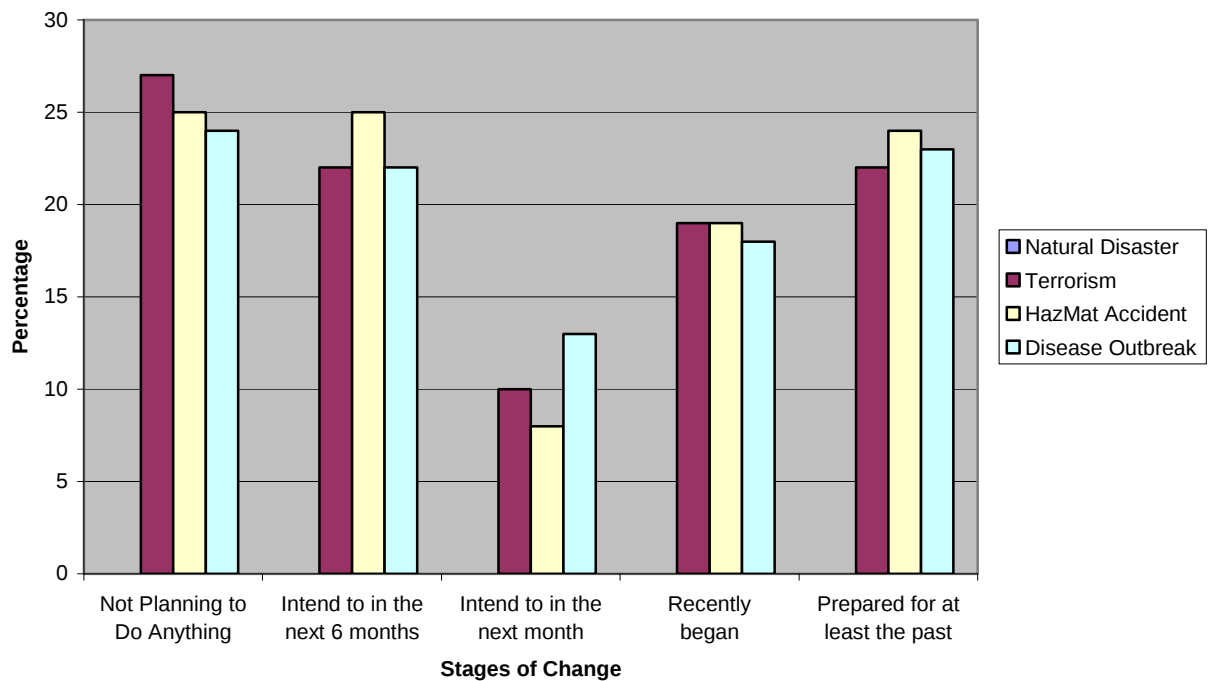


Figure 19. High Threat/Low Efficacy Profile Group across SOC (from FEMA, 2009)

These findings are not consistent with the predictions of the PDP Model. The 2009 FEMA report indicates that the “findings suggest that further examination of the model constructs is needed to better understand the relationship between the Threat/Efficacy Profiles and the Stages of Change” (FEMA, 2009). Since the Threat/Efficacy Profiles represent the Extended Parallel Process fear appeal outcomes and the Stages of Change represents the Transtheoretical Model, these findings may suggest a misalignment of the two behavior change models.

3. Integration of Community Factors

The very name of the Citizen Corps’ preparedness model gives an indication of the degree to which social and community factors have been integrated into the model. The *Personal Behavior Change Model for Disaster Preparedness* makes it clear from the outset that this model is designed and focused at the individual level. The model provides a list of *Individual Factors* (see Figure 12) that may impact individuals’ perceptions of

threat or their perceived ability to carry out recommended preparedness actions. This is the only reference for these or other social factors being integrated into the model. The 2009 *Personal Preparedness in America: Findings from the Citizen Corp National Survey* provided some insights that reinforced the need for integrating social and community influences into preparedness planning (FEMA, 2009).

Bourque and Mileti (2008) reported that one factor that motivated individuals to undertake preparedness activities was seeing other people take action to prepare. In their presentation, *Public Response to Terrorism in America*, they recommended encouraging people to talk with each other regarding preparedness activities. They made reference to the “monkey see, monkey do” approach (Bourque & Mileti). This is a social influence that is not addressed in either the Extended Parallel Process or the Transtheoretical Model.

Studies utilizing the Extended Parallel Process Model have identified the lack of social influences in the results of the outcome behavior changes. Schlehofer (2007), in her study of the perceived control and anxiety in predicting mammography utilization, reported that cultural differences influenced the intention to obtain mammograms across various ethnic backgrounds. She noted, “As a whole, these inconsistent results, and particularly these ethnic differences, suggest that the EPPM might not hold universally, but rather that factors that vary by culture (for instance, fatalism, distrust in the medical system, or perceived cultural incompetence of health care providers) might moderate processes posited by the model” (Schlehofer).

In a study that used the Extended Parallel Process Model to prevent noise-induced hearing loss among coal miners, Murray-Johnson et al. (2004) identified subjective norms as a limitation in the motivation of fear appeals. Their work identified the fact that coal miners were cognizant of what other miners were doing and wearing (hearing protection) and those subjective norms assisted or hindered the fear appeal motivating effect (Murray-Johnson et al.). Their work reinforces that fact that social norms influence an individual’s behavior, beyond what a fear appeal can motivate.

While less of an intervention model, the Transtheoretical Model also suffers from the absence of incorporating social factors that influence behavior. In a review of the TTM, Taylor et al. (2006) noted:

As with other social cognition models the TTM does not normally include objective—defined here as external fact based—measures of health related social, economic and environmental variables. Although it could be used in conjunction with such measures, and so might be able to support action relevant to the reduction of health inequalities, it is not primarily designed to support such approaches. The body of TTM research identified for the purposes of this review contains no evidence directly relevant to the social and economic determinants of individual or population health, or the ways in which such factors might impact on class (or other social/cultural position) related variations in cognition or health related behavior.

A study related to breast cancer screening among African American women, by Ashing-Giwa (1999), examined several health behavior change models and their socio-cultural relevance. Their study exposed two concerns with the TTM. The first was the reliance of the model to equate knowledge and information “with perceived susceptibility and the ability to engage in the prescribed health behavior” (Ashing-Giwa, 1999). The author stated that the model might have less utility for older African American women who might be less educated (Ashing-Giwa). The second issue was the over-reliance of the model on personal and individual control over behavior and the fact, as stated by Ashing-Giwa, that many African American women may not perceive personal control over their health status. The author recommends that future behavior models have several components added that will incorporate ethnic and cultural factors. The components included family relationships, social and political issues, religiosity, and socio-ecological factors (Ashing-Giwa).

B. CONCLUSION

Although the United States has made great strides in improving its capacity to respond to and mitigate large scale incidents resulting from acts of nature or deliberate acts of man, the development and improvement of community resiliency and preparedness has lagged behind. Hundreds of national surveys have been completed since the events of September 11, 2001 for the purpose of measuring citizen preparedness. The

collective results have shown that our nation's residents are not as prepared as they believe they are or know they should be. Examining these national survey results reveals a national population that is largely unprepared and potentially vulnerable to a catastrophic disaster or act of terrorism.

In an attempt to improve upon low preparedness levels, the *Citizen Corps Personal Behavior Change Model for Disaster Preparedness* (PDP) was introduced as a “tool to help design successful outreach/social marketing approaches and as a framework to conduct further research into the motivating factors and barriers to personal preparedness” (ORC Macro, 2006). Although the model was built upon the foundation of two recognized and frequently used behavior change models, the focus of the model is on the individual level and largely ignores the social aspects that influence an individual's beliefs, attitudes and behaviors.

The PDP attempts to take two theoretical models and combine them to provide the framework for future preparedness programs to be built upon. The use of an empirically derived equation, such as the one represented by the Extended Parallel Process Model, provides a formula that predicts behavior of an individual at a single point in time. As illustrated in this chapter, the EPPM's underlying theory requires a strong but balanced threat/efficacy message in order to be effective. This message needs to remain essentially the same regardless of where an individual may be along a continuum stage model, such as the Transtheoretical Model. The utility of a stage theory model is that intervention modalities can be matched to the particular stage an individual is at, thus maximizing the intervention. As the EPPM intervention remains the same across the first five stages, the necessity of combining the EPPM and TTM is called into question.

This should not be interpreted as challenging the efficacy of the Extended Parallel Process Model. There have been many studies that have demonstrated the effectiveness of this model to motivate people to adopt healthy behaviors. As such, this model should be maintained as a potential intervention tool, among other intervention models, which can be utilized when developing a preparedness program for a community.

Utilizing a stage of change model in the PDP recognizes the factors that lead people through the process of taking action or adopting a new behavior. However, due to its reliance on time limitations for each stage, the Transtheoretical Model is not the most ideal stage theory for the Citizen Corp Model. Additionally, the initial stages, such as Precontemplation, lump individuals together who may have distinctly different mindsets. For example, an individual who is not aware that they may live in a flood prone area would fall into the Precontemplation stage along with an individual who is aware of the threat but is unmoved to take action. It would seem logical that different interventions would be warranted by these two individuals

Improvements to the Citizen Corps *Personal Behavior Change Model for Disaster Preparedness*, which address the issues identifies in this chapter, will be discussed in Chapter VI. Among these changes will be a matched model, which incorporates matched individual and community level behavior change theory.

IV. COMMUNITY LEVEL BEHAVIOR CHANGE

Chapter IV will examine community, the role it plays in shaping behavior in our everyday lives and preparedness activities, and why it should be incorporated into a model for promoting preparedness. Section 1 through Section 4 will explore the aspects of defining community, the role it plays in preparedness and the ways in which behavior change can be implemented at the community level. Section 5 will introduce the Community Readiness Model that is a method of determining the level of acceptance a community has for the introduction of a new program or prevention strategy. Sections 6 and 7 will examine the applications and limitations of the Community Readiness Model.

A. THE ROLE OF COMMUNITY IN PREPAREDNESS

1. Preparedness and the Community

The Citizen Corp PDP Model's objectives to improve the level of civilian preparedness have been targeted at the individual level. The PDP Model utilizes two individual-based psycho-social behavior models as its theoretical underpinning, the Extended Parallel Process Model and the Transtheoretical Model. There is some feeling, however, that preparedness activities should be directed at the community level.

In *Social Infrastructure for Hometown Security: Evolving the Homeland Security Paradigm*, Bach and Kaufman (2009) decry the growing homeland security bureaucracy and implore national policy makers to return to the grassroots of community. According to Bach and Kaufman, "Community engagement has been left to become a 'nice thing to do,' rather than to take its proper place as the cornerstone of effective security." While their appeal to the administration dealt with the larger Homeland Security policy, there is some merit in exploring a community approach, in a psych-social sense, to addressing the issue of improving citizen preparedness activities.

In a public presentation to the National Press Club, Bourque and Mileti (2008) presented their findings from a survey of over 3300 households throughout the United

States. Their survey results reinforce a community approach to preparedness behavior change. Communities throughout the country were included in their study, as were the cities of New York, Los Angeles and Washington, D.C. The survey examined actions taken since the September 11, 2001 terrorist attacks and included activities pertaining to preparedness. Although their findings confirmed that most Americans are still not getting prepared, they did, however, discover some interesting facts regarding what motivates citizens to take action.

Bourque and Mileti (2008) reported that their survey indicated that there were two types of information that drove public action. The first type was that information that was received by individuals, such as television, radio, and print media. The second source of information was observed information. This information was gleaned by individuals observing others getting prepared. The observation of friends and neighbors partaking in preparedness activities was motivating to individuals. Adding to this was the finding that “milling” was indicated as a factor that indirectly motivated preparedness activities. Milling is described as the act of talking, discussing and seeking information about preparedness from others, which could be family members, friends, neighbors or co-workers.

Among their recommendations for improving civilian readiness was increasing the social interaction surrounding preparedness activities. In their presentation, they used the cliché “monkey see, monkey do” when they recommended getting “public readiness out of the closet and into the streets” (Bourque & Mileti, 2008). Seeing other people undertaking preparedness activities was found to be a motivating factor to many respondents. Encouraging people to interact and talk with others about preparedness activities was included in their list of recommendations, as they explained that “people are more likely to act after talking with others” (Bourque & Mileti). These results reinforce that public preparedness is not a solitary, individual activity. As such, programs or models that attempt to increase the rates of preparedness activities of our citizens must incorporate a community level intervention strategy. Failure to do so ignores all of the multiple factors and influences that either motivate or inhibit certain behaviors.

2. What is Community

The term community can be defined in a variety of ways. It can be used to describe a group of people living together within a defined geographic region or it can be applied to worshipers practicing their faith collectively. Whether religious, geographic, ethnic or social, a community can be defined by the set of values or norms that bind its members together. Nilsen (2006) provides another description of community:

A community can be understood both in terms of a geographical location and a relational entity, which refers to qualities of human interaction and social ties that draw people together. The two usages of the term are not mutually exclusive and the sense of community concept applies equally to the geographical and relational notion of community. However, modern society develops community around interests and skills more than around locality, implying that communities primarily are relational entities rather than geographically defined localities; what brings people together are common interests and shared values and norms around which social relationships develop.

Addressing behavior change at the community level, acknowledges the influence the community has upon its collective members' actions. As explained by Kelly et al. (2003):

Communities can shape individuals' behavior, both symbolically and tangibly, transmitting values and norms. As systems of exchange and influence, communities establish opportunities for people to behave in some ways and not behave in others.

One contemporary approach to promoting healthy behaviors entails examining all of the factors that can influence behavior at multiple levels and is referred to as the ecological perspective (National Cancer Institute, 2005). One such multilevel perspective identifies five levels of influence (McLeroy, Bibeau, Steckler & Glanz, 1988). The first of these levels is the intrapersonal level and consists of all characteristics that influence behavior at the individual level, such as, attitudes, personality traits, beliefs, and knowledge. The second level is the interpersonal level and involves all intrapersonal

interactions surrounding the individual's involvement with family and friends, and peers. The community level is composed of three sub-levels; institutional factors, community factors and public policy. It is at this level where rules, regulations, social networks and norms, local, state, federal policies and laws exert their collective influence on an individual's behavior (McLeroy et al., 1988). Figure 20 depicts the overlapping nature of multiple levels of influence, as illustrated by Smedley and Syme (2000), which collectively affect health behavior.

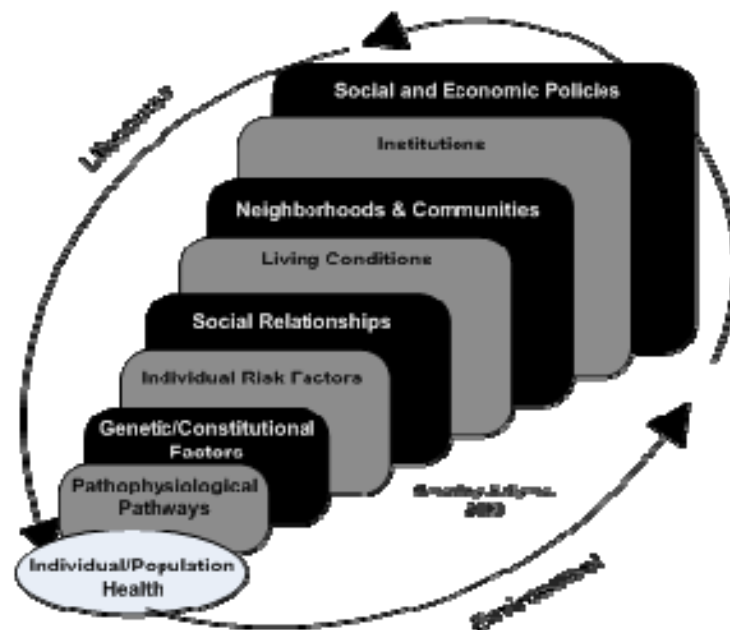


Figure 20. Multi-Level Influences (from Smedley & Syme, 2000)

As an example of the interplay of these various factors, suppose a middle-aged man avoids getting a colonoscopy. On an individual or intrapersonal level, this reluctance to getting the test may be based on a fear of discovering that he could have colon cancer. On an interpersonal level, he may have had the experience of dealing with a friend or relative who went through a cancer episode or he may have a family history of the

disease. An unpleasant incident experienced by a friend during a colonoscopy procedure, could have been described to our subject individual as a reason to avoid having such a test performed. Issues such as insurance coverage for the expense of the exam, an inability to schedule appointments due to work schedules, the unavailability of conveniently located diagnostic centers, cultural norms against such personal type exams are all community level factors that may contribute to the individual's final outcome behavior of not getting the exam. To simply focus on the individual-level factors, in an attempt to alter this gentleman's behavior, would completely miss the myriad other influences that shaped his decision.

3. Community Interventions

Community level interventions recognize these multiple influences on the target population's behavior and seek to develop strategies to address them. (National Cancer Institute, 2005). Three such interventions, described in *Theories at a Glance* (National Cancer Institute), are Community Organization Models, Diffusion of Innovations Theory and Communications Theory. While an in-depth analysis of each of these interventions is beyond the scope of this work, a brief overview of each follows.

In the Community Organizing Models, small local groups are helped to come together and identify the various factors or influences that contribute to the target behavior. The National Cancer Institute (2005) explains, "Strict definitions of community organizing assume that the community itself identifies the problems to address (not an outside change agent)." Table 1 outlines the approaches utilized by community organization models to affect behavior.

Table 1. Community Organization (from National Cancer Institute, 2005)

<i>Term</i>	<i>Definition</i>	<i>Potential Change Strategies</i>
Empowerment	A social action process through which people gain mastery over their lives and their communities.	Community members assume greater power, or expand their power from within, to create desired changes.

<i>Term</i>	<i>Definition</i>	<i>Potential Change Strategies</i>
Community Capacity	Characteristics of a community that affect its ability to identify, mobilize around, and address problems.	Community members participate actively in community life, gaining leadership skills, social networks, and access to power.
Participation	Engagement of community members as equal partners; reflects the principle, “Never do for others what they can do for themselves”	Community members develop leadership skills, knowledge, and resources through their involvement.
Relevance	Community organizing that “starts where the people are”	Community members create their own agenda based on felt needs, shared power, and awareness of resources.
Issue Selection	Identifying immediate, specific, and realizable targets for change that unify and build community strength.	Community members participate in identifying issues; targets are chosen as part of a larger strategy.
Critical Consciousness	Awareness of social, political, and economic forces that contribute to social problems	Community members discuss the root causes of problems and plan actions to address them.

Diffusion of Innovations Theory describes how a new idea or process is communicated throughout a society or from one society to another. This theory has been used to understand how new programs or health behaviors are adopted, accepted and utilized throughout the community. Table 2 illustrates the central concepts of this theory (National Cancer Institute, 2005).

Table 2. Concepts in Diffusion of Innovations (from National Cancer Institute, 2005)

<i>Concept</i>	<i>Definition</i>
Innovation	An idea, object, or practice that is thought to be new by an individual, organization, or community
Communication channels	The means of transmitting the new idea from one person to another

<i>Concept</i>	<i>Definition</i>
Social System	A group of individuals who together adopt the innovation
Time	How long it takes to adopt the innovation

Rogers (1995) described the different levels of health behavior innovation adoption. Individuals will adopt the behavior changes by altering their lifestyle. On an organizational level, these innovations may be adopted by rule or policy changes. Finally, the changes may become adopted formally by the community and used to model other initiatives. The intent is to spread the new health behavior throughout the levels and have it become institutionalized. The factors affecting the speed at which the innovations spread throughout the various levels of influence are described in Table 3 (National Cancer Institute, 2005).

Table 3. Factors Related to Spread of Innovations (from National Cancer Institute, 2005)

<i>Attribute</i>	<i>Key Question</i>
Relative Advantage	Is the innovation better than what it will replace?
Compatibility	Does the innovation fit with the intended audience?
Complexity	Is the innovation easy to use?
Trialability	Can the innovation be tried before making a decision to adopt?
Observability	Are the results of the innovation observable and easily measurable?

In Communications Theory, the emphasis is on exploring what is being said, to whom it is being said, how it is being said and the effects those messages are having (National Cancer Institute, 2005). Specifically related to health communications, public health communications, seeks to utilize the benefits of communication theory to improve public health. As described by the National Cancer Institute, public health communications “should represent an ecological perspective and foster multilevel

strategies, such as tailored messages at the individual level, targeted messages at the group level, social marketing at the community level and mass media campaigns at the population level.”

Key among the various communications strategies is the media. In today’s society the mass media can play a pivotal role in shaping behavior. The advantage media has over other communication venues is the ability to repeatedly put a message out. According to the National Cancer Institute (2005), “Repeated exposure to a message, especially when it is delivered through multiple channels, may intensify its impact on audience members.” The advent of new communication mediums, such as email, text messaging, social networking sites and computer-based health resources has presented the communications theorists with fertile ground for research and promises to revolutionize the manner in which health-related communication is carried out.

Whether utilizing grassroots groups, innovation diffusion or mass media communication, behavior change theories that target the community level recognize the multi-layered influences that shape individual behaviors. Thompson and Kinne (1990) stated in their article *Social Change Theory* that there is a growing recognition that behavior is greatly influenced by the environment in which people live. They argue that rather than emphasizing individual change, the emphasis should be on a community approach. This approach promises a longer duration change in behavior. By changing the acceptable social norms related to a particular behavior, a much broader community-scale behavior change can be accomplished (Thompson & Kinne).

According to Thompson and Kinne (1990), there are two important principles in the study of communities. The first being the definition of community and the second being a “systems” perspective to community. They provide a broad definition of community that extends beyond a simple collection of individuals living together geographically. They look upon community as a group of people living together and who share common values and institutions. As explained by Thompson and Kinne, “Community components include locality, an interdependent social group, interpersonal relationships, and a culture that includes values, norms, and attachments to the community as a whole, as well as, to its parts.” The definition of community is very

important to the authors as it suggests that a community creates a whole that is much greater than a simple sum of its parts and much more than a collection of individuals.

Figure 21 illustrates the second principle, approaching community from a “systems” perspective. As shown, there are a number of components that make up the community system, including individuals (Individual level), sectors (Subsystem level), coalitions, boards and networks (Inter-relationship level) and the top of the system the community (System level). All of the components of the system share “in cooperation and consensus on societal goals, norms, and values” (Thompson & Kinne, 1990). Thompson and Kinne explain:

The system, however, is not a simple aggregation of its component parts; rather, it is a unique structure that includes all the parts and relations that connect them. The system provides the context for all activities, including making choices about behaviors. Thinking of a community from a systems perspective allows a better understanding of the interconnections of the various community levels, sectors, relationships and members.

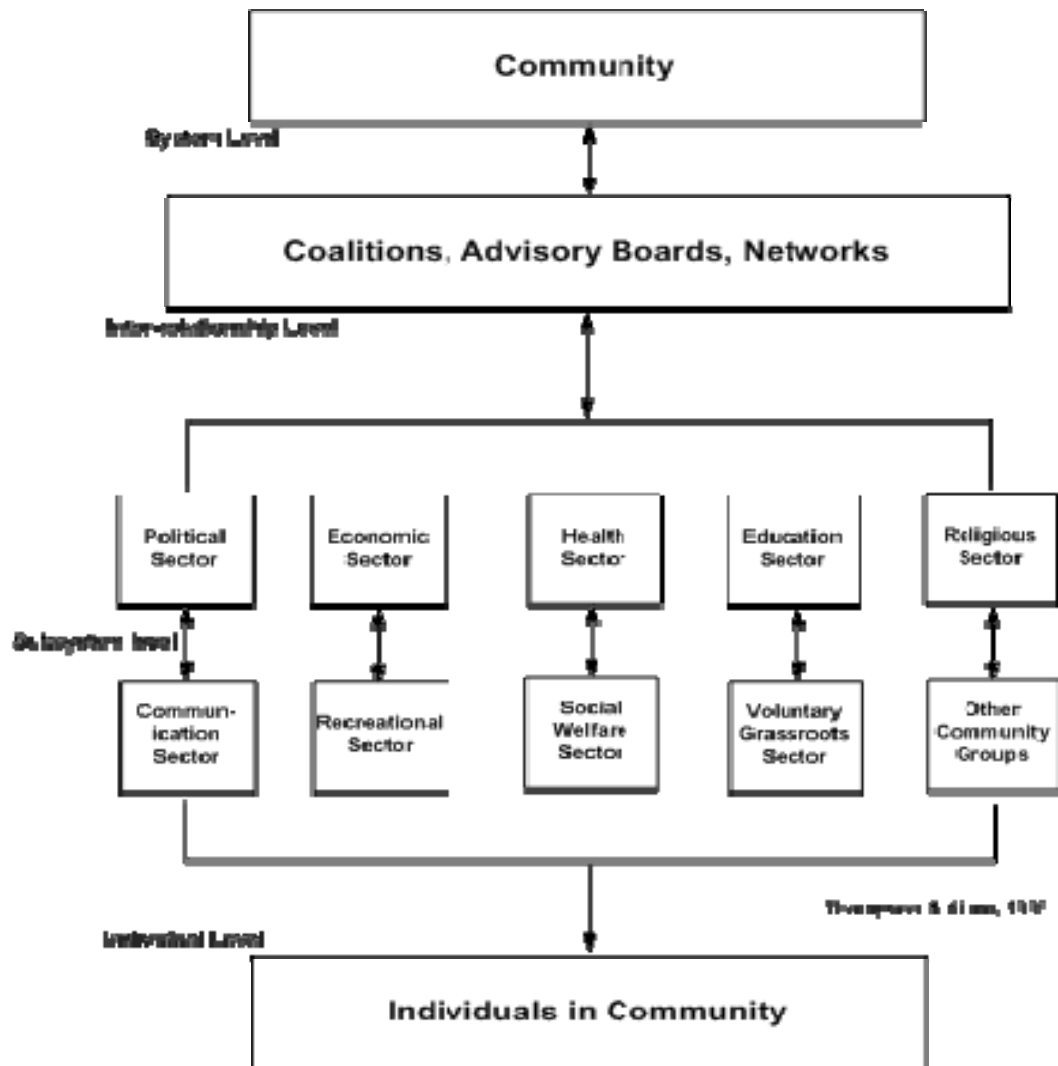


Figure 21. The Community as a System (from Thompson & Kinne, 1990)

While change is possible at any of the individual system levels, when change is initiated within any one sector, overall system change will be dependent upon the speed of distribution of the change from level to level. Additionally, the change effort may be stopped or delayed at any level during the process. The true objective, if community change is desired, is to target the change at the system level. Change initiated at this level will be spread rapidly throughout the entire system and result in a changes at the sector and individual levels (Thompson & Kinne, 1990).

4. Implementation of a Community Program

Just as there are multiple behavior change models and intervention strategies for individual behavior change, there are multiple strategies for community-level intervention. Creating a plan for implementing an intervention is an important step in the designing the overall program. Planning models, such as the PRECEDE-PROCEED and social marketing are tools that can assist planners with the development of their programs. PRECEDE-PROCEED is a planning instrument that starts with the desired community outcomes and then works backward through a nine-step planning process to determine the strategies needed to achieve the desired outcomes. (National Cancer Institute, 2005)

Social marketing is a tool that utilizes commercial marketing theory to develop behavior change programs for a target audience. Key differences from commercial marketing are the outcomes, which are measured in terms of positive changes on the key populations rather than increased sales or profit. Another key difference is that the gain realized from the promotional effort is realized by the community at large. An important requirement for a successful social marketing campaign is accurate audience segmentation. Treating an entire community as one homogenous population will limit the success of the program. “Social marketing seeks to identify patterns that distinguish one target group from another to effectively target market strategies (National Cancer Institute, 2005).

Another aspect to developing a behavior change program at the community level is determining the readiness of the community to accept change. The idea of community readiness, according to Donnermeyer et al. (1997), is not a new one and “is implied in the concept of social action process, which has been part of the community development literature for decades and continues to be an important theme up to the present time.” In their article, *Community Readiness and Prevention Programs*, the authors contribute a large share of drug prevention program failures on the subject community’s lack of readiness to “accept the idea that there was a problem and that something needed to be done” (Donnermeyer et al.). They go on to state, “In other words, the relative level of a

community's readiness to accept and support a program is a key element in its success, and one that is often neglected during the planning process" (Donnermeyer et al.).

B. THE COMMUNITY READINESS MODEL

1. Development and Theory

Based upon the early theoretical foundation of Rogers and Warren, the Community Readiness Model was developed in an effort to improve community drug and alcohol abuse programs (York & Hahn, 2007). This theory posits that a community moves through nine distinct stages of readiness when dealing with a social problem. The theory also holds that it is possible to measure and determine that stage the community is at in relation to a specific problem and that stage-specific interventions can be designed to assist the community in progressing through the stages.

The Community Readiness Model was developed in 1995 by a group of researchers from the Tri-Ethnic Center for Prevention Research of Colorado State University. While attending a conference at the Kentucky Conference for Prevention Research, these individuals attended a presentation, given by Mary Ann Pentz, on the concept of community readiness. The presentation suggested that a community's effort to successfully address a problem was directly tied to that community's readiness to change the behavior associated with the problem (Edwards et al., 2000). That presentation inspired the group to collaborate on the development of a "community readiness" model. One answer that they sought was why one community could successfully implement a community intervention program, yet another community failed at implementing a similar program. Their work led them to theorize that communities are unique organisms that are at different stages of readiness for change. Edwards et al. noted they found that "communities are fluid—always changing, adapting, growing; they are ready for different things at wholly different times." As described by Plested, Edwards and Jumper-Thurman (2007):

The Community Readiness Model was originally developed specifically for alcohol and drug abuse prevention but has been successfully adapted to address a gamut of social and environmental issues. Topics have included

intimate partner violence, inhalant abuse, traumatic brain injury, suicide, minority participation in breast cancer trials, methamphetamine abuse, cultural competency, animal control, obesity, and a wide variety of other issues.

As stated simply by Kelly et al. (2003), “The Community Readiness Model is a theory-based, community-directed approach that examines dimensions and stage of readiness to deal with the issue at hand.”

The Community Readiness Model was built upon the theoretical foundation of individual stages of change and community development theory. Oetting et al. (1995) described the model as being “based on two literature/research traditions that have rarely borrowed from each other, but are in fact similar in many ways.” These two sources are the concept of psychological change and diffusion of innovation and community development (Oetting et al.). The theory’s developers utilized the idea of progressive stages of change from the Transtheoretical Model (Prochaska & Velicer, 1997) and drew upon social action processes, as described by Warren (1978) to form the structure of the new community-based stage of change model.

There were nine distinct stages of readiness within the CRM’s theoretical framework. They are described by Plested et al. (2006) as:

1. No awareness,
2. Denial/resistance,
3. Vague awareness,
4. Pre-planning,
5. Preparation,
6. Initiation,
7. Stabilization,
8. Confirmation/expansion, and
9. High level of community ownership.

Although it may appear that these stages bear a resemblance to the stages of the Transtheoretical Model or other stages of change models, there are important differences. The measurement of the commitment to solving the problem by community leadership is an important component within the CRM, yet not a factor of measurement with a personal stage model. Additionally, an individual's stage of change in relationship to a particular issue is one-dimensional, while a community's relationship may present many varied levels of readiness within it (Edwards et al., 2000).

At the first stage (No Awareness), the community is not aware that the behavior, or lack of behavior, is an issue. The targeted behavior may have existed for such a long time that it has become engrained into the community and accepted. A mentality of "that's the way it has always been" develops and the community or community leaders no longer visualize the behavior as abnormal (Plested et al., 2006).

Denial or resistance marks the second stage of readiness. At this stage, several members of the community have detected and recognized the problem behavior, however, the community at large or the community leaders do not accept the existence of the problem. As awareness of the problem spreads, the community begins to enter a state of readiness. It is at this stage where, although the general awareness of the issue has grown in the community, there is still little motivation for efforts to change. This point in readiness characterizes the Vague Awareness stage (Plested et al., 2006).

The next three stages mark the beginnings of formal change processes: Pre-planning, Preparation and Initiation. Pre-planning marks the stage where the community as a whole has recognized the need for change and small efforts are being made to address it. These efforts are typically uncoordinated, scattered and not focused. The appearance of leaders, emerging to coordinate the efforts, and offers of help from community leaders marks entry into the Preparation stage of change. As formalized efforts begin to emerge and a visible effort against the behavior becomes known, the community has entered the Initiation stage (Plested et al., 2006).

The Stabilization stage begins as community efforts become supported by both the community at large and community leaders. It is at this stage where support staffs are

trained and gain experience in the interventions used. As the community becomes accustomed to the new programs, they support its continuation and expansion. This utilization and support for the change efforts indicates that the community has entered the Confirmation/Expansion stage. The final stage, referred to as High Level of Community Ownership, signifies that the community has not only successfully implemented the program, but that they have gained extensive knowledge about the “prevalence, causes and consequences” of the problem (Plested et al., 2006). The model of change, which the community itself has developed, is now being used as a framework to tackle other issues within the community (Plested, Edwards & Jumper-Thurman).

Figure 22 illustrates the overall planning process for conducting a Community Readiness survey (Plested et al., 2007). The important aspect to remember is the CRM is not an intervention. It is a model to identify a community’s level of readiness to address an issue and provide information to guide the development of strategies and policies to facilitate the desired change within a community. Utilizing this model will help prevent an ad hoc approach to solving a community issue, which may miss or ignore important social factors integral to the success of a community campaign.

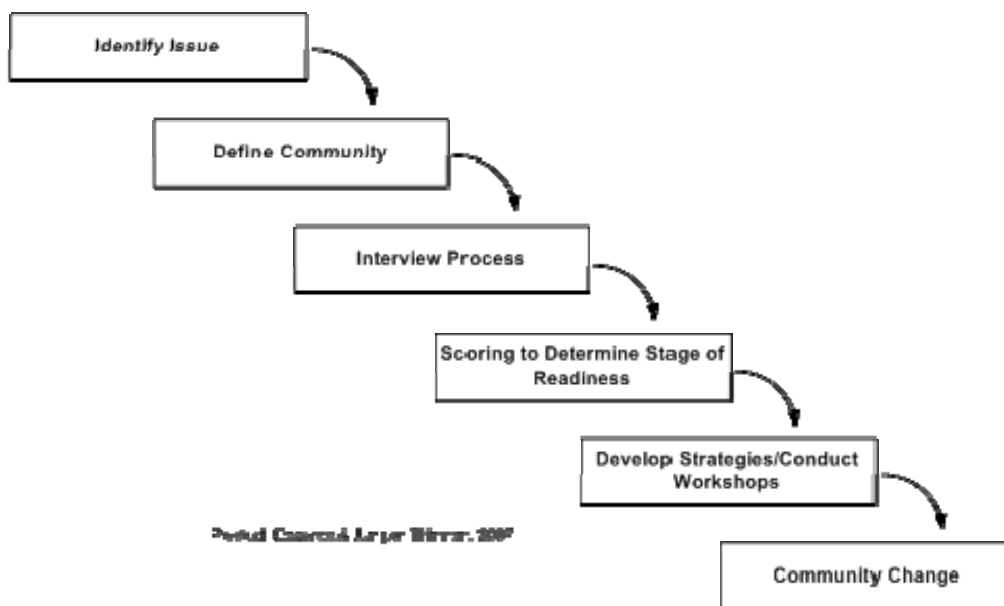


Figure 22. Community Readiness Planning Process (from Plested et al., 2007)

The initial process of assessing the community in order to determine the stage of readiness it is at, involves the identification and interviewing of “key informants” from within the community. These individuals should represent the crucial stakeholder groups and the community at large. The process involves a face-to-face interview, which revolves around six dimensions:

1. Existing community efforts (programs, activities, policies, etc.),
2. Community knowledge of those efforts,
3. Leadership (includes appointed leaders and influential community members),
4. Community Climate (prevailing attitudes in community about the issue),
5. Knowledge about the issue, and
6. Resources related to the issue (Kelly et al., 2003).

The model posits that gathering key informant information about these six dimensions provides a clear picture of the community and its readiness for change (Jumper-Thurman et al., 2003a).

Through a series of workshops, utilizing expert raters, a set of anchored ratings were developed for scoring the key informant interviews. Oetting et al. (2001) described how reason anchored scales were developed:

Once a basic framework was created, it was necessary to fill in the details and develop effective methods for assessing community readiness. Construction of the community readiness assessment instrument drew on methods developed by industrial psychologists. Anchored rating scales are particularly valuable when the actual behaviors of different people may be very different because they work in different jobs, but where we need to compare levels of performance. Anchor statements are developed that are representative of every level. The actual behaviors of the individuals can be described, and even if the behavior is not listed, the rater can make a good judgment about whether the behavior is similar to, above, or below the validated anchors.

Creating the actual ratings entailed writing many descriptive statements for each of the six dimensions. A group of psychologists and sociologists, who were experienced

in working with communities, were then asked to place each of the descriptive statements into one of the six dimensions and also within one of the nine stages of readiness that they felt appropriate. Upon completion, the process was then repeated. A Delphi procedure was then used to finalize the ratings (Oetting et al., 2001).

Obtaining the information needed to rate a community came from the key informant interviews. These interviews are conducted, via telephone, by trained interviewers. Through a series of open-ended questions for each of the six dimensions, the interviewers gather the information that will be applied to the anchored ratings. Working independently, the results of the interviews are rated by two separate scorers. Starting at the lowest rated anchor statement, each scorer reads through the interview to determine if that statement has been met. If it meets the statement, the scorer moves up to the next higher statement. According to the handbook provided to administer the survey, “In order to receive a score at a certain stage, all previous levels must have been met up to and including the statement that the scorer believes best reflects what is stated in the interview” (Plested et al., 2006). Once completed, the two interviewers meet, review the results and arrive at consensus on assigning a final dimensional score.

A series of formulas are applied to the consensus score, which provides an overall stage of readiness score. It is this score that determines where a community is in relation to its degree of readiness to address the issue and what types of interventions are best suited for community interventions. Table 4 highlights the goals of interventions for each stage. A list of suggested interventions for each stage can be found in Appendix I.

Table 4. Intervention Goals for Readiness Stages (from Plested et al., 2006)

<i>Stage</i>	<i>Goal</i>
No Awareness	Raise awareness of the issue
Denial/Resistance	Raise awareness that the problem or issue exists in the community
Vague Awareness	Raise Awareness that the community can do something
Pre-planning	Raise awareness with concrete ideas to combat condition
Preparation	Gather existing information with which to plan strategies

<i>Stage</i>	<i>Goal</i>
Initiation	Provide community-specific information
Stabilization	Stabilize efforts and programs
Confirmation/Expansion	Expand and enhance services
High Level of Community Ownership	Maintain momentum and continue growth

There have been many communities that have utilized the Community Readiness Model and reported various degrees of success. Some communities have reported no movement forward through the stages. Edwards et al. (2000), explains that although many different reasons were given for this lack of movement, one consistent theme has been “political changes within the community/tribes/villages and/or personnel changes in which those trained in using the model leave the area.” A review of the literature surrounding the use of the Community Readiness Models follows.

2. Application of the Community Readiness Model

Stallones and Thoreson (2007) documented three case studies in which the Community readiness Model was utilized. These studies were performed in conjunction with the Colorado Injury Control Research Center (CICRC) in an effort to direct community-based prevention interventions. The first case was a traumatic brain injury prevention program instituted in four counties in Colorado. A program to increase the usage of child booster seats using the community readiness model was the second and a program to increase seatbelt usage in two rural Colorado counties was the third.

In the Traumatic Brain Injury Prevention study, four Colorado counties (Summit, Montrose, Conejos, and Morgan) were selected for participation in the program (Stallones & Thoreson, 2007). Key informants were selected from each community and included community leaders in the traumatic brain injury field, public health, human services, schools, hospitals, law enforcement, mental health and outdoor recreational industries. Telephone interviews were performed with the key informants both before and after the study in order to determine the stage of readiness for the community (Stallones & Thoreson).

After assessing the initial readiness stage for each county, a prevention program was developed that matched the county's readiness. The assessments revealed that the county of Summit had community leaders who were aware of the issues and took an active approach to injury prevention. This county was judged to be at the preparedness stage of readiness. The county undertook three separate brain injury prevention initiatives, a bike and ski helmet acquisition program, an educational program for children 12–14 years of age stressing the importance and effects of brain injuries, and an upgrade program for brain injury data collection (Stallones & Thoreson, 2007).

Conejos County was initiated graded at the denial stage at the start of the program. Generalized information regarding brain injury prevention was provided to the community in both English and Spanish. At the completion of the study, post activity interviews indicated that the county had moved to the vague awareness stage. Montrose County also began the program in the denial stage and ended with post-activity interview ratings of vague awareness. Morgan County was the one community that did not change stages throughout the study (Stallones & Thoreson, 2007).

In 2001, researchers at CICRC performed a study utilizing the Community Readiness Model in a community. Their study included the intervention community and also utilized a non-intervention community as a control. Key informants were chosen from each community and included elected officials, school personnel, police, health department staff, physicians and local merchants (Stallones & Thoreson, 2007). The interview results were used to “define target population groups, refine the educational and media messages and to develop strategies for delivering the intervention information” (Stallones & Thoreson). The pre-activity interviews indicated that most of the dimensions scored at the vague awareness level. Both the community efforts and resources dimensions scored at the preparation stage. The program strategy was to move all of the dimensions into the preplanning stage and beyond. As described by Stallones and Thoreson (2007):

During the 3-year campaign, 1,390 child booster seats were distributed at community and school events. Mass-media campaigns included 17 radio stations, reaching approximately 340,000 people per week, that aired child booster seat messages; 13 billboards and 12 bus shelters that displayed

child booster seat messages; more than 35,000 informational brochures in English and Spanish that were distributed; and information that was provided to local physicians.

The campaign was successful in moving the dimensions of community knowledge/effort, leadership, community climate and community knowledge/issue from the Vague Awareness stage to the Preplanning stage. Although the community overall remained in the Preplanning stage, the booster seat usage in the community increased from 11 percent to 46 percent (Stallones & Thoreson, 2007).

The control community moved from an initial overall staging of Vague Awareness to Preplanning. Their booster seat usage increased from two point five percent to 13 percent (Stallones & Thoreson, 2007). The authors believed that the change “may have resulted from a national booster seat media campaign, statewide media about the passage of a new state booster seat law in 2002, and local health department educational efforts” (Stallones & Thoreson).

The third case study was an initiative to increase seatbelt usage by 10 percent in targeted communities. By utilizing newly formed community coalitions, the CICRC hoped to implement an enhanced seatbelt enforcement program and media campaign. During the campaign development, the initial plan of utilizing two intervention counties and three comparison counties was objected to by a coalition member who believed that the differences between the communities in the counties were too great. As a result, the county in question was divided into four separate communities and interviewed individually.

The results of the interviews indicated that the four communities were very similar in their stage of readiness with each scoring at the Vague Awareness stage (Stallones & Thoreson, 2007). Compliance surveys also revealed that all of the communities had low levels of seatbelt usage. While the case study was not complete at the time of publication, there were some positive results from the Community Readiness surveys. The four seemingly different communities were shown to, in fact, share many similar qualities (Stallones & Thoreson).

York, Hahn, Rayens and Talbert (2008) describe a large study in Kentucky using the Community Readiness Model to examine local smoke-free policy development. The study involved utilizing the six readiness dimensions to evaluate 64 counties on the development of a smoke-free policy. According to the study, counties were chosen as the “community” entity so that both demographic and political factors could be examined (York, Hahn, Rayens & Talbert, 2008).

A revised questionnaire was developed to assess the six CRM’s dimensions related to the “elected official’s views on and support of local smoke-free policy development (York et al., 2008). The results of the interviews and readiness scoring indicated that all stages of readiness were represented by the counties. Most of the jurisdictions were in the lower stages of readiness. Of those counties scoring in the higher stages of readiness, most had either passed or enacted smoke-free regulations and ordinances (York et al.). The authors reported that population size turned out to be a predictor in developing a smoke-free policy, with the smaller communities less likely to adopt such policies than larger ones (York et al.). The researchers found the model to be “relevant and appropriate for examining the factors that influence readiness for local smoke-free policy development” (York et al.).

One of the limitations noted in the study was the small number of key informants used for each community. Two key informants were selected from each county to be interviewed, an elected official and a Tobacco Control Coordinator (TCC). The elected officials were either county judge executives or mayors, and were chosen to determine the political readiness for change. The TCCs were used as key informants because they were “located in local health departments throughout the state and are responsible for preventing initiation, promoting cessation, and eliminating exposure to SHS (second hand smoke) and for reducing disparities” (York et al., 2008). The use of only one key informant (TCC) to measure the overall community readiness turned out to be a perceived limitation of the study. The CRM recommends four to five key informants be used; however, this study utilized one key informant (elected official) to determine the political readiness and one informant (TCC) to assess the overall community. This turned out to be a smaller sampling than the researchers would have liked (York et al.). As

reported by the authors, “However, the perceptions of only one key informant were used to score each dimension, and this may have limited the validity of the dimension scores and the overall stages of readiness” (York et al.).

The importance of properly determining key informants for readiness interviews was also raised by Lawsin, Borrayo, Edwards, and Belloso (2007) in a study of community readiness to promote Latinas’ participation in breast cancer prevention clinical trials. In a study of two rural and two urban areas in Colorado, key informants were interviewed to determine the degree of readiness to encourage Latinas’ participation in breast cancer prevention activities. The study results indicated a low level of awareness of breast cancer as a health problem affecting Latina women. More importantly, the study highlighted the lack of insight from the CRM’s dimensions on factors relating to being from a lower socioeconomic background, being a women and being a minority (Lawsin et al., 2007). The author’s expressed concern that key informant’s views could potentially represent “only the vocal minority as opposed to the community at large” (Lawsin et al.). By utilizing a wide range of individuals as key informants, such as health department personnel, non-profit organizations and folk healers, the researchers attempted to overcome this limitation. “By interviewing leaders who work with community members on a variety of levels, the authors attempted to gain perspectives that would represent different factions in the community” (Lawsin et al.).

The importance of the information gathered from key informant interviews was emphasized in a study of community readiness for HIV/AIDS prevention (Plested et al., 2007). This study assessed the readiness of 30 rural U.S. communities of diverse ethnic backgrounds to address HIV/AIDS issues and prevention programs. These communities consisted of 10 African American, 10 Mexican American and 10 White Non-Mexican American. Four or five key informants were interviewed by telephone from each of the localities.

Although ethnic background and race were not mentioned during the interviews with key informants, the interviews revealed distinct themes associated with each unique ethnic community (Plested et al., 2007). Excessive travel distances to receive HIV/AIDS services were mentioned by every one of the 10 white non-Mexican communities.

Additionally, when discussing resources for prevention programs, the Red Cross was identified as a resource only by key informants in the white, non-Mexican communities. Interviews with key informants from African American communities discussed the social impact on individuals with HIV/AIDS contracted through blood product transfusions/medical procedures versus other means. The means of infection within these communities was perceived to make the difference between an infected individual being treated compassionately or being shunned. The Mexican American community interviews revealed the lowest level of awareness about the problem of HIV/AIDS than any other community.

The authors pointed out the “richness” of the interviews that “went beyond merely identifying stages of readiness associated with each dimension, and overall, although these numbers are very useful, the content of responses gives greater understanding as to why readiness levels are where that are and gives clues to strategies for increasing readiness”(Plested et al., 2007).

In a 2005 application of the Community Readiness Model in Union County, Oregon, key informants were interviewed in preparation of initiating a childhood obesity prevention program (Findholt, 2007). As the delineated “community” was large and included six separate towns, a decision was made to include fifteen key informants instead of the recommended four to five. Findholt commented that just the process of using the CRM stimulated interest within the community in assisting with the prevention effort. It was reported that several of the key informants became interested in the project during the interview process and volunteered their assistance. In fact, the assessment process generated a great deal of support for the program, prior to any strategies being implemented (Findholt).

A study of 16 U.S. communities was conducted to determine if specific interventions could influence a change in three of the six readiness dimensions. Eight of the communities were randomly selected to be involved with a community-level media intervention and the remaining eight served as controls. The dimensional changes hypothesized to occur were:

1. Communities receiving the community readiness/media training intervention will show greater increases in community readiness scores on the community knowledge of issue dimension.
2. Communities receiving the community readiness/media training intervention will show greater increases in community readiness scores on the community climate dimension.
3. Communities receiving the community readiness/media training intervention will show greater increases in community readiness scores on the community leadership dimension. (Slater et al., 2005)

The study was conducted over a two year period with key informant interviews initially involving 112 individuals across all of the communities. Key informants from each community interviewed for the study were members from human services, law enforcement, the school district, the community at-large and an elected official.

The overall project centered on youth substance use issues. Workshops were held in the eight intervention communities and participants were shown various media interventions and encouraged to utilize them to bring greater public attention to the youth issue. Additionally, local media representatives were invited to attend the workshops and were encouraged to partner with community participants (Slater et al., 2005). The expectation of the campaign designers was that the issue awareness created by the media reinforced social marketing effort would “impact awareness and support in the wider public, as well as, stimulate a more active and engaged leadership with respect to the issue” (Slater et al.).

As the campaign was two years in length, post-interview problems were encountered by the researchers. Although attempts were made to re-interview the same key informants as were interviewed during the base-line assessment, only 36 percent of those individuals were contacted. The remaining key informants were no longer available for post-interviews due to job turnover or other reasons (Slater et al., 2005). As the readiness assessment interviews were designed to be reports of objective criteria, the mixture of one-time and repeat key informant interviews provided an opportunity to determine if any sensitization occurred from the interview process itself. Following the analysis of pre- and post interviews, the authors found no significant statistical

differences between individuals interviewed once or individuals interviewed twice. In their opinion, those results confirmed the objective measurement obtained by the key informant interviews (Slater et al.).

Determining the validity of the initial three hypotheses, the authors reported that the post-interview readiness assessments supported hypothesis 1 and partially supported hypotheses numbers two and three. Their analysis concluded that changes in the remaining three dimensional indices, as well as, the control communities' dimensional readiness measurements did not approach significance (Slater et al., 2005). Although not reporting specifically on the behavior changes achieved during the intervention, the authors did state that their analysis indicated "significant treatment effects on youth substance uptake" (Slater et al., 2005). Specific intervention results were published in Health Education Research (Slater et al., 2006).

The authors opined that the partially supported hypotheses may have been a result of the small number of communities included in the study. Acknowledging the additional cost involved with increasing the number of communities, the authors added, "It appears desirable, given the findings of this study, to increase power less expensively by expanding the number of community informants interviewed, even if this only produces redundant information from the point of view of formative research assessment" (Slater et al., 2005).

3. Limitations and Gaps

Although hundreds of programs and studies have been performed utilizing the Community Readiness Model since its development in 1995 (Plested et al., 2006), the model is not without limitations. Central among these is the difficulty to utilize traditional measures of reliability (Plested et al.). The model developers rely on the wide acceptance and use of the CRM as a measure of its validity, although they admit that fact does not demonstrate scientific validity. They point to consistent patterns among respondents and inter-rater reliability as indications of model validity.

The reported consistency among respondents is reported by the developers to be very high. They caution, however, that this consistency does not translate into all respondents saying the same thing or providing the same information about the community. On the contrary, key informants are chosen specifically because of the unique viewpoint regarding the community issue that they bring. The developers do note, however, that whenever there is a situation where respondent's opinions are significantly different from other respondents, additional interviews are performed in order to determine the source of the differences (Plested et al., 2006).

The reliability in scoring the interviews is estimated, by the developers, to be extremely high. When comparing the scores of two independent evaluators, the exact same score for a given dimension was reported to be assigned 92 percent of the time (Plested et al., 2006). As reported in the CRM handbook:

The inter-rater reliability is, in a sense, also evidence for the validity of the measure in that it reflects that each of the two persons reading the transcript of the same interview, were able to extract information leading them to conclude that the community was at the same level of readiness. If the assessment scales were not well grounded in the theory, we would expect to see much more individual interpretation and much less agreement. (Plested, Edwards & Jumper-Thurman, 2006)

York and Hahn (2007) acknowledge the models use in developing and implementing prevention and treatment programs, but question whether the model is adequate to assess the climate for policy change. They argue for further research to determine its applicability. Among their concerns are whether or not the six dimensions accurately reflect the conditions necessary for policy change and infer that a seventh dimension, aptly named "community climate" may be needed to measure readiness in that area (York & Hahn). They list themes that could be included within that dimension as, "the possibility of preemption, effects of elections, political champions, issue framing, other policy issues having precedence, accessibility to elected officials, and turf disputes among elected officials" (York & Hahn).

Beebe, Harrison, Sharma and Hedger (2001) provide an extensive list of limitations, which in their opinion restrict the effectiveness of the Model to accurately

assess a community's readiness. Foremost among their criticism is the use of key informants. According to the authors, the shortcomings of this approach are that key informants may:

1. Not be indicative of the community at large, but rather, a vocal minority,
2. Understate a problem to lessen the appearance of the community being undesirable,
3. Overstate a problem in an attempt to create a need for new or continued funding, and
4. Be too resource intensive for most communities. (Beebe, Harrison, Sharma & Hedger)

The lack of an external validation of the assessment instrument was also cited as a limitation of its use. Allowing interviewers leeway and discretion in rating the interviews was, in the opinion of the authors, a limitation of the instrument's anchored rating scale.

To that end, the authors put forward a survey instrument, which could be mailed to respondents and, both quickly and inexpensively, measure population attitudes towards the issue of substance abuse and their receptivity to prevention efforts. During the development of the survey tool, dimensions were identified to represent readiness domains; they were perception of alcohol, tobacco, or other drug (ATOD) problem in the community, support for prevention, permissive attitudes toward teen use, perception of adolescent access and perception of community commitment (Beebe, Harrison, Sharma & Hedger, 2001).

To test the new survey instrument, 15,000 households in 30 communities in Minnesota received the survey by mail. After the return of the surveys, they were analyzed to determine the validity of the readiness domains, develop a readiness rating scale and determine the validity of the scale. The overall view of the researchers was the Community Readiness Survey development was successful in creating a tool that could inexpensively and quickly measure readiness in the community for ATOD prevention programs.

Those analyses lead to several changes in the readiness domains and removal of some scales, which were felt to not provide any utility in the survey. The authors expressed an opinion that the usefulness of the tool could be extended to other readiness initiatives. Beebe, Harrison, Sharma and Hedger (2001) explain:

In addition to its potential utility as an evaluation tool, future research should attempt to apply scales similar to those described herein to other problems a community can face. Examples of such problems include health and nutrition, public safety, the environment, various social problems, and local economic development. An understanding of a selected community's prevailing attitudes and knowledge could prove useful in these areas, as well.

V. DEVELOPING AN INTEGRATED MODEL

The Citizen Corps Personal Behavior Change Model for Disaster Preparedness, as shown previously, is based on two psycho-social behavior change models. One of which is the Transtheoretical or Stages of Change Model. The use of the TTM appears to serve as a means to provide a placeholder for individuals and their demonstrated degree of readiness to change, rather than a means to initiate change. Besides utilizing the Extended Parallel Process Model as a tool to motivate individual behavior, the Citizen Corps model provides the preparedness planner with few other tools with which to effect change.

As shown in Chapter IV, the Transtheoretical Model emphasizes the length of time an individual has been contemplating or actually making a decision to change behavior as the delineation factor in assigning stages. In a study of dietary behavior, Povey et al., considered the time parameters of the TTM troublesome and stated, “In addition, the results also seem to lend support to the view that traditionally imposed time distinctions (i.e., 6 months to distinguish between action and maintenance) are arbitrary and do not necessarily fit in with the ways in which people appear to behave” (Povey, Conner, Sparks, James & Shepard, 1999).

Furthermore, the TTM classifies potentially dissimilar behavioral intentions into singular stages. For example, the Precontemplation stage groups together both individuals who have never heard of or are not aware of the problem and those individuals who are aware of the problem yet are not engaged by issue. Weinstein and Sandman (2002) argue that there is a distinct difference between those two mindsets.

Finally, the TTM was originally designed to address cessation of addictive behaviors (Povey et al., 1999) and not for the adoption of protective behaviors, such as preparedness activities. It has been suggested that due to these and other limitations, the Transtheoretical Model should be discarded (Sutton, 2005). This author believes that a stage model, which identifies the readiness stage an individual may be in, could be useful

to a preparedness planner, particularly if it were complimentary to a community-wide assessment of readiness. To that end, an alternative model, which overcomes the identified deficiencies of the TTM, will be presented.

This chapter will begin with a discussion of the Precaution Adoption Process Model. The development of the theory, its conceptual layout and studies designed to validate the existence of distinct stage-based variables will be examined in Sections 1 through 3. Section 4 will identify the limitations and gaps that exist with the model. Subchapter B will introduce an integrated community/individual preparedness model, which will incorporate the individual-level analysis of the Precaution Adoption Process Model with the community-level assessment of the Community Readiness Index.

A. PRECAUTION ADOPTION PROCESS MODEL

1. Development of the Precaution Adoption Model

The Precaution Adoption Process Model (PAPM) was developed in 1992 by Weinstein and Sandman to explain actions or behaviors to protect from external hazards or threats (de Vet, de Nooijer, Oenema, de Vries, & Brug, 2008). In developing their theory, they sought to create a new model that expressed stage processes in layman's terms and avoided labels recognizable only to researchers. They believed that most individual health theories attempted to use a single equation of variables applied across all individuals in order to predict behaviors (Weinstein, Sandman & Blalock, 2008). Their PAPM advocated an approach where separate distinct predictive equations could be developed to address specific stages of change. The result of such an approach would be a customizable intervention to behavior change tailored to an individual's personal stage of change.

Weinstein, Sandman and Blalock (2008) proposed four criteria for their model:

1. A category system to define the stages
2. An ordering of the stages

3. Common barriers to change facing people in the same stage
4. Different barriers to change facing people in different stages

One of the realities of developing a “stage” theory is that the “stages” must be defined and delineated with beginning and end points. Notwithstanding this, Weinstein, Sandman and Blalock (2008) do not believe that the stages have a hard fast line of demarcation, but rather provide an “ideal” or “prototype” for each stage (Weinstein, Sandman & Blalock, 2008).

Although the ordering of the stages provides a progression of mindsets from inaction to action, the PAPM does not require individuals to proceed through all of the stages in a neat forward progression. Weinstein, Sandman, and Blalock (2008) explain that individuals may move both forward and backward between stages, skip stages and, at times, may even step off of the path to action. The core principle of the PAPM is the premise that individuals at the same stage of change face similar barriers and those barriers differ from barriers present to individuals at other stages. As explained by Weinstein, Sandman and Blalock, “If factors producing movement toward action were the same regardless of a person’s stage, the same intervention could be used for everyone, and the concept of stages would be superfluous.” The PAPM does not provide detailed information about the barriers present at each stage, as Weinstein, Sandman and Blalock considered those barriers to be problem specific. For instance, the factors or barriers facing an individual and a weight control problem would be different then those factors or barriers facing an individual and radon testing.

2. Conceptual Design

Although originally devised in 1988 (Weinstein, 1988), the current version was published in 1992 and outlined seven stages (see Figure 23). Stage 1 (unaware of the issue) is where an individual who is completely unaware of an issue would be located. Weinstein, Sandman and Blalock (2008) point out that an individual who has never been informed of an issue could have not formed an opinion about that issue. Being aware of an issue, but not yet engaged by it, is the premise of Stage 2. It is at this stage where an individual, although now aware of the issue, still has other more important issues

competing for his attention. This does mark the point where the individual, who is now aware, begins to form opinions about it (Weinstein, Sandman, & Blalock).

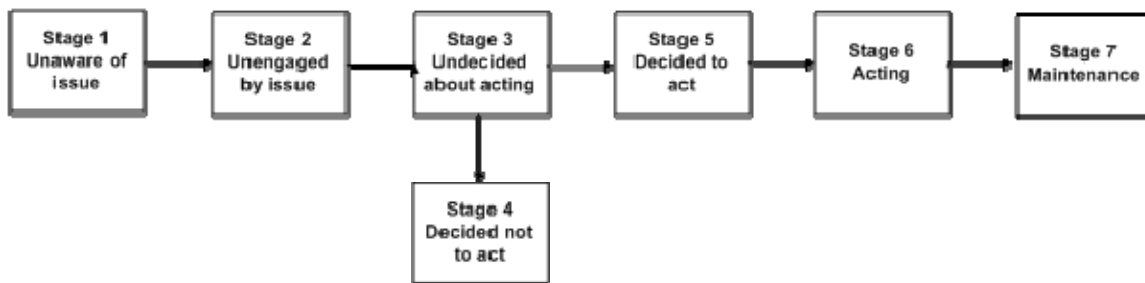


Figure 23. Precaution Adoption Process Model Stages

Becoming engaged by an issue and continuing to formulate an opinion, yet not arriving at a decision creates the criteria for Stage 3. Movement from this stage requires a decision and leads to two possible choices. Deciding to act would move the individual to Stage 5 or deciding not to act would move them to Stage 4. The distinction between Stage 4 and Stage 5 is important, as Weinstein, Sandman and Blalock (2008) felt that once an individual has made up their mind (whether to act or not), the persuasion needed to change their mind is much different than for one who is still undecided. “People who come to a definite position on an issue, even if they have not yet acted on their opinion, have different responses to information and are more resistant to persuasion than people who have not formed opinions” (Weinstein, Sandman & Blalock). An individual’s movement from Stage 5 to Stage 6 is marked by the change from intention to action. The final stage, Stage 7, is maintenance. This is the stage where individuals develop the strategies to continue behavior that is repetitive in nature such as annual breast exams.

One key aspect of the PAPM is the attention it pays to the four stages of inaction (Stage 1, 2, 3 and 4). According to Weinstein, Sandman and Blalock (2008), “A growing body of research (Gollwitzer, 1999) suggests that there are important gaps between intending to act and carrying out this intention, and that helping people develop specific implementation plans can reduce these barriers.” Stages 1 through 3 are opportunities for social influence. Individuals at Stage 1 require more information about an issue in order for them to become aware of it. People in Stage 2 require information to make the issue

more personally relevant. Weinstein, Sandman and Blalock (2008) maintain that “Individualized messages and contact with friends and neighbors who have considered action should help these individuals move to the next stage.”

A social awareness that most people have made up their minds related to an issue may motivate individuals from Stage 2 to Stage 3. Weinstein, Sandman and Blalock (2008) believe that it is at Stage 3 where most popular cost-benefit theories of health behavior can be appropriately applied to how individuals decide what to do and state, “Perceived susceptibility is one factor that can influence what people decide and is included in most theories of health behavior”...“consequently, overcoming this reluctance is a major barrier to getting people to decide to act.” Blalock et al., (1996) and Weinstein and Sandman (1992) have reported that individuals at Stage 4 can be “well informed and tend to dispute or ignore information that challenges their decision not to act” (Weinstein, Sandman & Blalock, 2008).

The PAPM Stage theory appears to be similar to the Transtheoretical Model. Weinstein, Sandman and Blalock (2008) point out that the main similarity is in the naming of stages only. Both models utilize different criteria for defining stages, with the TTM using time criteria that focuses on days or months until action. Another significant difference is that the TTM’s Precontemplation stage includes two of the PAPM stages (Stage 1 and Stage 2). Weinstein and Sandman (1992) consider these two stages to be completely separate. It is not logical to believe that one who is not engaged by an issue has the same barriers as an individual who is not even aware of the problem, as the former needs to address other life issues that compete for his/her attention, while the latter simply needs to become informed.

Weinstein, Sandman and Blalock (2008) emphasize that the PAPM is not a risk-based model. Although early researchers interpreted the model to be focused on risk perception, the authors insist those interpretations are incorrect. Current versions of the PAPM utilize the mental state of the individual towards the action in question in order to determine staging, not the individual’s perception of risk.

3. Validation of Stage Theory

One of the premises of the PAPM and an area that requires validation is that the factors or barriers facing individuals in one stage are different than the ones they face in another stage. The follow section describes several studies that attempt to establish the different barriers or variables that are stage dependant. Utilizing comparisons of continuity/discontinuity patterns of variable change, as well as, matched/mismatched interventions will be discussed as methods utilized to substantiate the PAPM's stage theory.

De Vet et al. (2008) conducted a study of 735 adults to determine and explore the psychosocial variables that influenced each of the PAPM stages and fruit intake. By utilizing electronic questionnaires, one at the start of the study (baseline) and two follow-up (35 and 67 days), the researchers looked to examine which factors influences the movement from stage to stage. Specific among the factors were "risk-perception, attitude, pros, cons, perception of personal status regarding the target (e.g., self-rated fruit intake), social influences (subjective norms, modeling and social support) and self-efficacy (de Vet, et al.). The five research questions the study looked to answer were:

- The baseline differences in the variables between the stages for fruit intake,
- The movement between the PAPM stages during the two questionnaires,
- Which psychosocial variables predicted movement from:
 - Engaged to undecided,
 - Undecided to decided not to act,
 - Undecided to decided to act,
 - Decided to act to the acting stage, and
- The differences in fruit intake among the stages and the effect upon fruit intake of moving from the deciding to act to the acting stage. (de Vet, et. al.)

Baseline analysis indicated that most individuals were in the decided stages or the acting stage. “Significant differences between PAPM stages were found for all psychosocial variables, with large effect sizes for perception of own fruit intake level, attitude and self-efficacy” (de Vet et al.). Figure 24 illustrates the different variables that were found between adjacent stages.

In examining the stability of stages between questionnaires, de Vet et al. (2008) discovered that between the first and second survey questionnaire (35 and 67 days) 72 percent of the respondents remained in the same stage, with most of those individuals in the acting stage. Stage 2, or unengaged, was the least stable stage between the baseline and 35 day questionnaire and the decided-not-to-act the least stable between 35 and 67 days. De Vet, et al., reported “significant baseline differences between the PAPM stages in all psychosocial variables (risk perception, attitude, pros, cons, perception of own fruit intake level, subjective norms, social support, modeling and self-efficacy.” A study found that subjective norms were the most relevant for individuals moving from the engaged to the undecided stage (de Vet et al.).

A limitation of this study was the fact that it did not include anyone within the unaware stage. de Vet et al. (2008) indicated that it was obvious to them that it would be difficult to find individuals who were not aware that fruit intake was a healthy behavior. The second limitation was the relatively small numbers that changed from one stage to the next. The predictive nature of their study was limited by this fact and, to that end; de Vat et al. recommended larger studies to minimize this shortcoming.

The overall findings of this study were that factors relating to attitudes and social influences may be important if one is to decide to act, whereas strong self-efficacy may be also required for acting on the decision to act” (de Vat et al., 2008). A comparison was made by the researchers to the TTM and noted that several of the stages overlapped and believed that further empirical study was needed to see how the different stage classifications were related to each other.

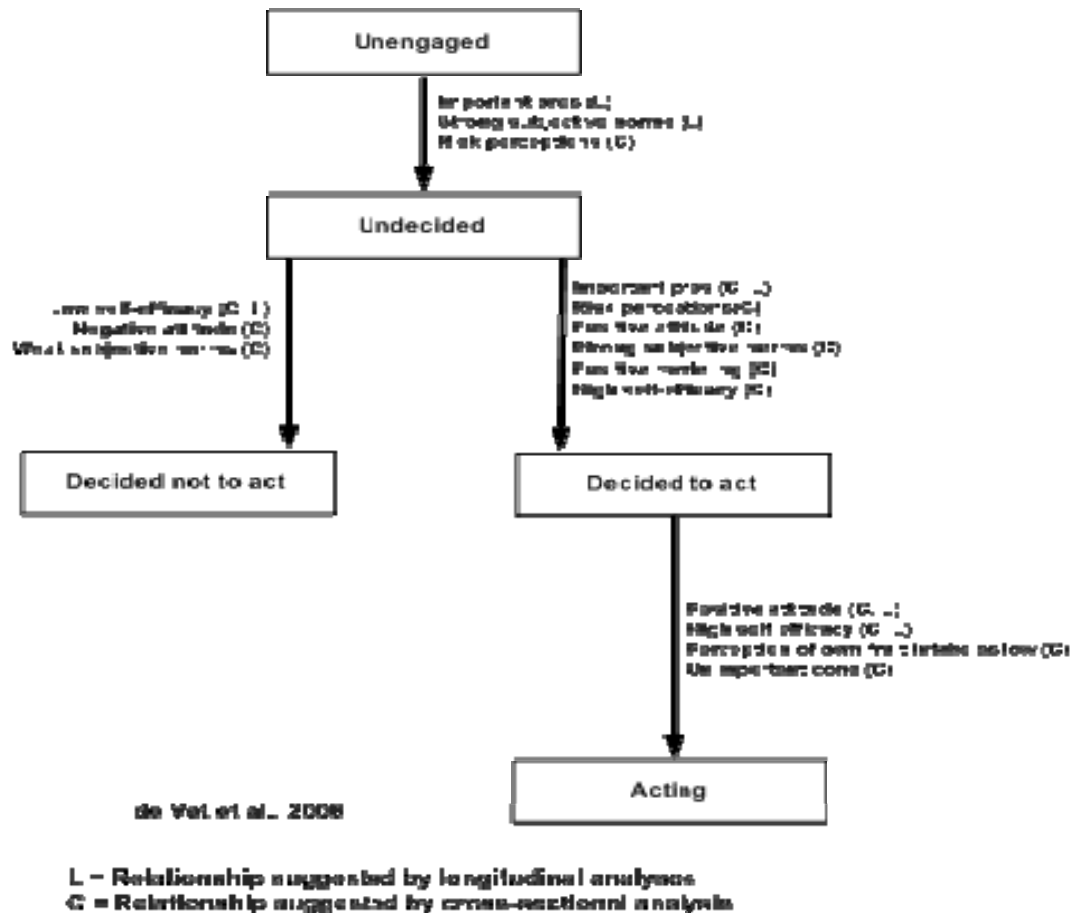


Figure 24. Stage Suggested Psycho-social Variables (from de Vet et al., 2008)

Sniehotta, Luszczynska, Scholz & Lippke (2005) expressed that proponents of continuum models suggest that the segmentation of change into stages is arbitrary and not based upon any empirical evidence. One method of testing the validity of PAM stages is by examining the patterns of change in the psychosocial variables between stages. In order to accomplish this, a cross-sectional data analysis is performed where the study population is broken down into groups by their PAM stages. A unique variable is identified and then examined across all of the groups to determine any differences. If the variable differs significantly between the groups and creates a direct linear pattern across the stages, a continuity pattern would be said to exist (Sniehotta et al., 2005). This pattern of continuity would indicate a natural progression of change and the separation of the population into stages for this variable would be unnecessary. Where evidence of

linear processes exists, the breaking up of behavior into stages is known as a pseudo-stage (Sutton, 2000a). Conversely, a discontinuity pattern, or one in which the studied variable is distinctly different between stages and not producing a linear effect, would indicate that the variable influences behavior in specific ways at specific stages of change. This would be supportive of a stage of change theory.

To determine the presence of stage changes in behavior, Sniehotta et al. (2005) studied the variables of perceived vulnerability, positive and negative outcome expectancies, self-efficacy and procrastination related to changing one's meat consumption during a 2001 livestock epidemic in Germany. The research question they posed was whether discontinuity patterns would be present in those variables across selected stages. A positive finding would suggest a validation of the basic premise underlying a stage of change theory.

The study involved the use of an on-line survey instrument. On-line advertisements on a German University and German magazine's website invited internet users to participate in the study. A link on the site led the users to a self-administered questioner. A total of 808 individuals participated in the study and when the analysis of that questionnaire was completed, the results yielded patterns of both continuity and discontinuity.

The variable of perceived vulnerability displayed significant differences between stages and created a discontinuity pattern. As Figure 25 illustrates, vulnerability was highest among the deciding to act stage and low for the unengaged and acting with intention for maintenance. Figures 26 and 27 shows the pattern generated by the variables of positive and negative outcome expectancies, respectively.

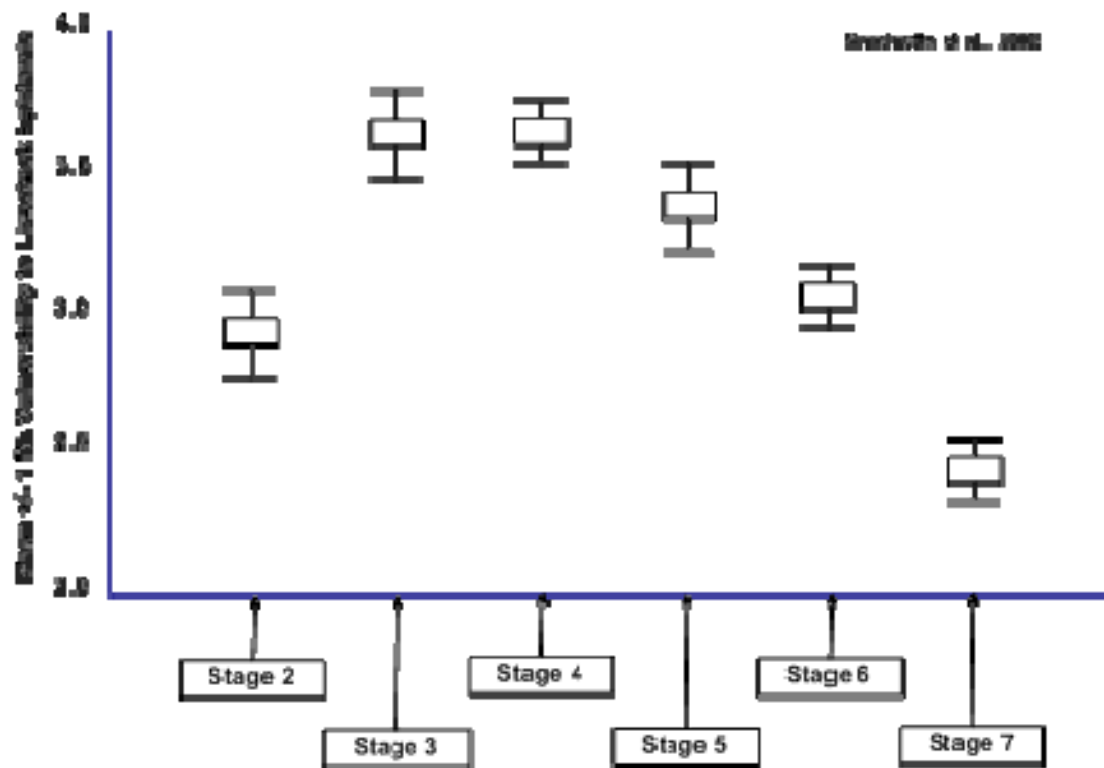


Figure 25. Vulnerability across Stages (from Sniehotta et al., 2005)

Positive expectancies (Figure 26) created a continuity pattern, which is in line with a pseudo-stage. This suggests that the positive outcome expectancy increases as individuals move through their behavior change and is not dependant upon stages. The negative outcome expectancy did, however, demonstrate a discontinuity pattern (Figure 27), suggesting that this variable is distinctly different between stages. Self-efficacy, overall, displayed a linear progression (Figure 28) indicating a pseudo-stage. However, when excluding all action stages, a discontinuity pattern was observed across the pre-action stages. The variable procrastination displayed a distinct difference between stages, which created a discontinuity pattern and supported evidence of stage dependency (Figure 20).

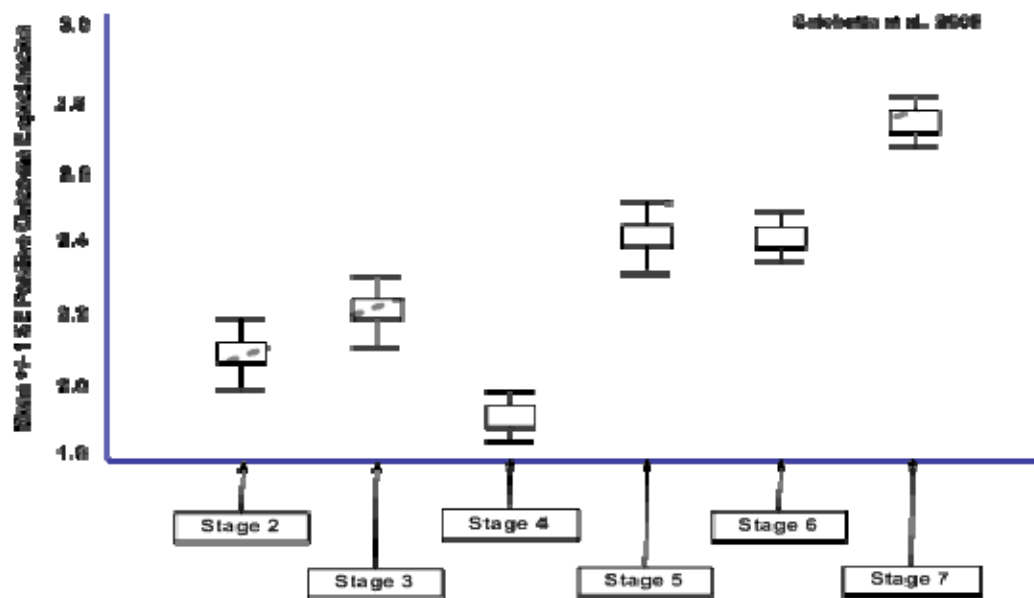


Figure 26. Positive Outcomes across Stages (from Snihotta et al., 2005)

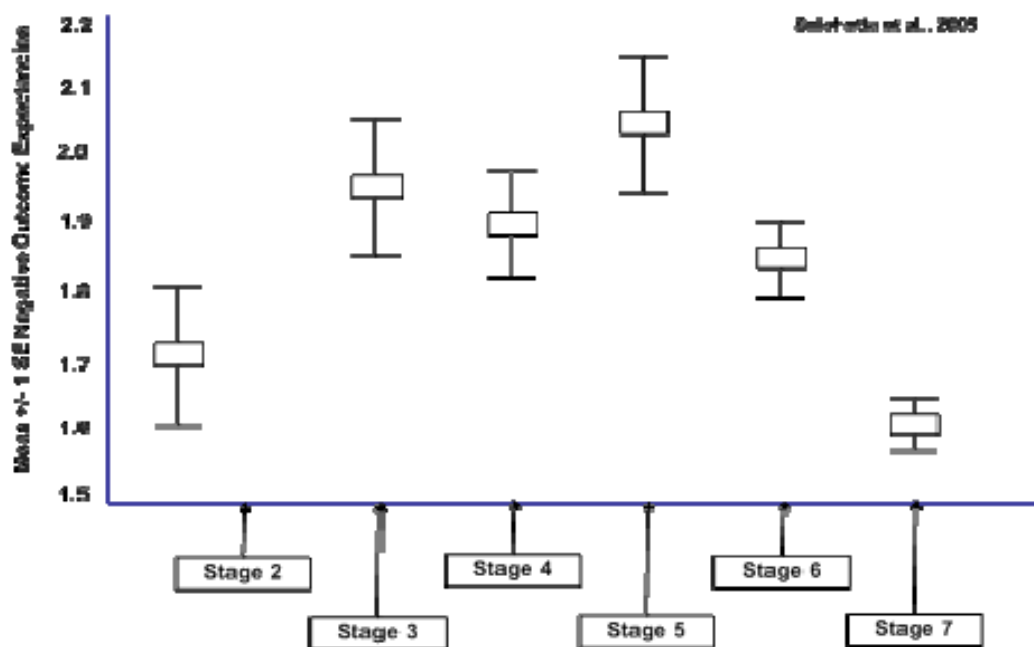


Figure 27. Negative Outcomes across Stages (from Snihotta et al., 2005)

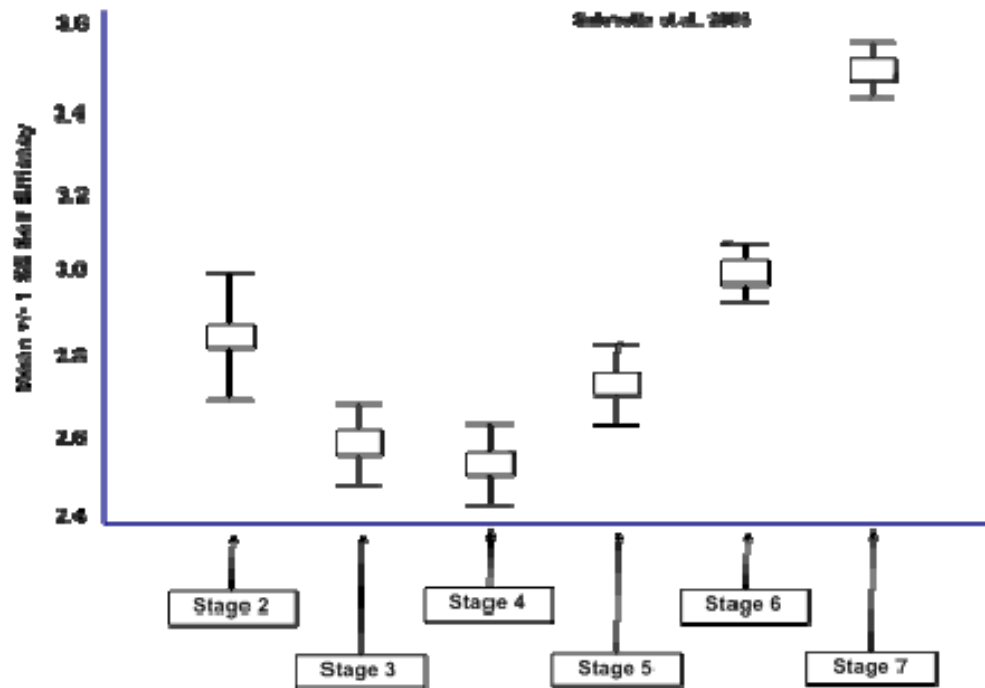


Figure 28. Self-efficacy across Stages (from Snihotta et al., 2005)

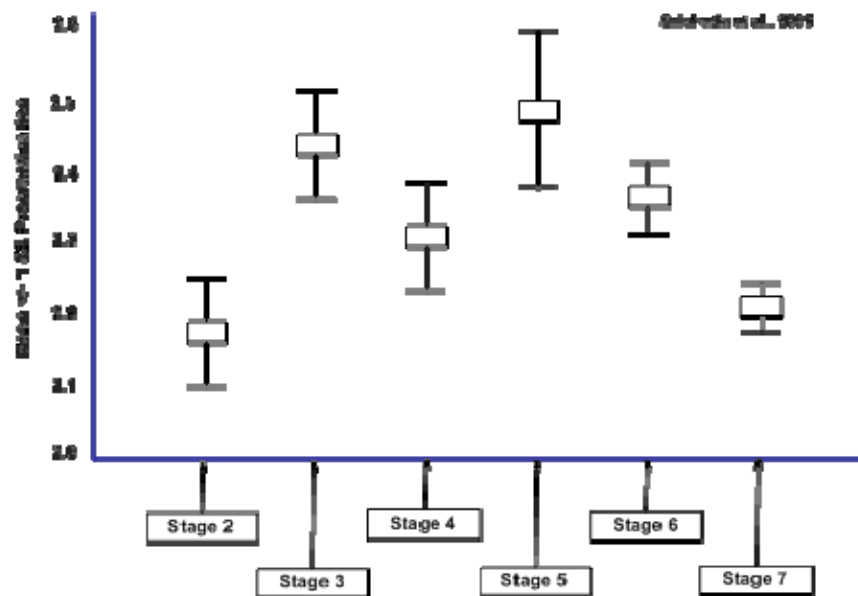


Figure 29. Procrastination across Stages (from Sniehotta et al., 2005)

The study suggested that not all behavior influencing variables are stage dependent. However, the finding of discontinuity patterns among several variables does indicate a stage specific influence. Sutton (2000a) concluded, “Predicting and finding different discontinuity patterns for different theoretically relevant variables can be interpreted as support for the notion of distinct stages.” Further studies of this type are needed to differentiate stage dependant and independent variables. Besides providing additional evidence for stage theories, identifying stage dependant variables will allow future researchers to develop specific variable-specific interventions.

Another method of testing the validity of stage-based models, which Sutton (2000a) considered one of the strongest tests, is the application of matched versus mismatched interventions. Weinstein, Lyon, Sandman and Cuite (2003) devised such an experiment to test the theory that there were different barriers faced by individuals who were in different stages. The context of the study involved the issue of radon and radon testing in homes.

Radon is a radioactive gas, which is found naturally in rock and soils. It can accumulate within the basements of homes by seeping in through foundation cutouts, cracks or spaces between pipes. According to the National Academy of Sciences, Radon exposure is the second leading cause of lung cancer, after smoking, in the United States (Weinstein, Lyon, Sandman & Cuite, 2003). Columbus Ohio was chosen as the study site, as that region was known to have elevated radon levels and there had been little previous attention paid to the issue.

In their study, the researchers focused on two sets of stage transitions regarding homeowner's decisions to test for radon in their homes; from the Undecided to Act stage to the Decided to Act stage and from the Decided to Act stage to Acting stage. After performing preliminary surveys, the researchers randomly assigned target homeowners to receive one of the four interventions. The first intervention was designed, through the use of video and written media, to increase the perception of personal risk to radon (Intervention 1). This was chosen as previous surveys had indicated that risk perception was effective in motivating people who were undecided to act, yet have little motivational power to move individuals from the Decided to Act stage to the Acting stage (Weinstein, Lyon, Sandman & Cuite, 2003).

The second intervention was designed to reduce the barriers to performing the act of testing by providing video and written media that increased the ease of ordering a test kit and performing the test (Intervention 2). An introductory video and a neutral message regarding radon were designed as a control (Intervention 3) and a combination of an increased risk message and ease of effort message was used as a fourth intervention (Intervention 4).

The match/mismatch hypothesis used in the study is illustrated in Figure 30. Intervention 1 was hypothesized to move a person from the Undecided to Act stage to the Decided to Act stage (matched intervention—Group A), yet not move an individual from the Decided to Act stage to the Act Stage (mismatched intervention—Group B). Intervention 2 was hypothesized to move individuals from the Decided to Act stage to the

Acting stage (matched intervention—Group C), but not move individuals from the Undecided to Act stage to the Decided to Act Stage (mismatched intervention—Group D).

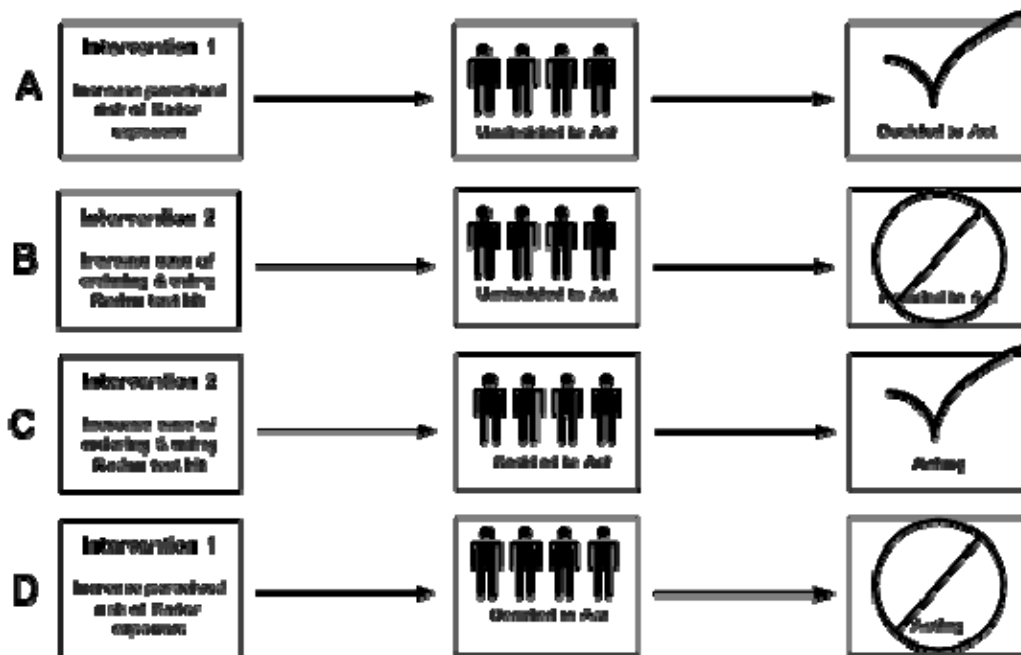


Figure 30. Match and Mismatch Hypothesis

Video tapes, survey forms and other intervention-based information were mailed to the target homeowners. Progress from one stage to another was indicated by survey results and a count of the actual Radon kit test ordered. Analysis of the study indicated that the matched interventions did, in fact, motivate movement from one stage to the next much more strongly than the mismatched interventions (Weinstein, Lyon, Sandman & Cuite, 2003). These results suggested the validity of stage specific variables, in this case vulnerability and low efficacy, which stage specific interventions could capitalize on.

The authors posited that Intervention 1 (increased risk message) might have created even greater stage movement if they could have been more effective in relaying a more convincing risk message. In their findings, they referred to an optimistic bias, which they found to be prevalent among homeowners after they received their intervention message (Weinstein, Lyon, Sandman & Cuite, 2003). Although Intervention 1's message

informed homeowners that approximately 73 percent of the homes in their neighborhood had a radon problem, the homeowners self-rated their own risk at 54 percent. As stated by Weinstein et al. (2003), “Optimistic bias—the tendency to rate one’s own risk as lower than peers’ risk—actually increased after exposure to the risk information.” This bias was reported to have increased from 4.7 percent to 8.7 percent, pre-intervention to post-intervention respectively.

4. Comparison of the PAPM to the TTM

Although similar in appearance, there are fundamental differences between the Transtheoretical Model and the Precaution Adoption Process Model. Both models attempt to capture the “categories into which people could be classified and identify the factors that could induce movement from one category to the next” (Weinstein, 2002). However, each model differs in how it classifies people into those categories, the number and type of categories and the movement through each category.

The first fundament difference between the models was the intended purpose for which they were developed. The TTM model was initially formulated to “describe the process of addictive behaviors” (Povey et al., 1999). The PAPM was developed in an attempt to “explain precautionous actions regarding external hazards or health threats and was first applied and tested for the precaution of testing homes for radon gas” (de Vet et al., 2008).

Figure 31 provides a side by side comparison of the two models. This will be used to illustrate the models’ differences in stage progression, stage assignments and alignment of compatible stages. There are six stages delineated in the TTM, while the PAPM posits seven. However, each model contains stages that the other does not. The TTM model provides for a Termination stage (Stage 6), which the PAPM lacks. The Termination stage characterizes the complete extinguishment of the behavior without any future chance of its reappearance (Clarke, 2002). As the PAPM model was not designed for the elimination of addictive behaviors, there was no reason to provide for such a stage. The Decided Not to Act stage is unique to the PAPM and is a stage that accentuates the difference between the two models. The TTM model does not separately

account for an individual who is fully aware of the hazards, risks and/or benefits of the new behavior and yet refuses to take action. These individuals would fall into the Precontemplation stage of the TTM (Weinstein, 1992). The PAPM takes this conscious decision into account and thus becomes the only model of the two that provides a stage for the individual who steps off of the path to change.

Both models allow for the regression from a higher stage back to a lower stage. This movement may occur when an individual attempts the new behavior and fails or unsuccessfully attempts to break an old behavior. In both models, the individual may regress back to the Contemplation stage (TTM) or the Undecided Stage (PAPM), where they may remain until moved to reattempt the change. Regression can move an individual back from any stage to any stage in both models; however, it is impossible to move back to a Precontemplation stage or an Unaware stage once a cognitive thought process has begun regarding the issue (Prochaska & DiClemente, 2002; Weinstein & Sandman, 2002).

There are no time considerations regarding the length of time one has been considering taking or taking an action in the PAPM. The TTM has a six month time frame on not planning to act in the Precontemplation stage and a six month planning time for the Contemplation stage. When an individual decides to take action (Preparation), they must plan their action within the next thirty days. Performing the behavior for at least one month, places the individual in the Action Stage and the behavior must continue for more than six months for them to be considered to be in the Maintenance stage (Redding, Rossi, Rossi, Velicer & Prochaska, 2000). The PAPM does not consider time frames or past behavior for the assignment of stages. It is simply the mindset of the individual at the moment of measurement that determines which stage they fall into (Weinstein, Sandman & Blalock, 2008).

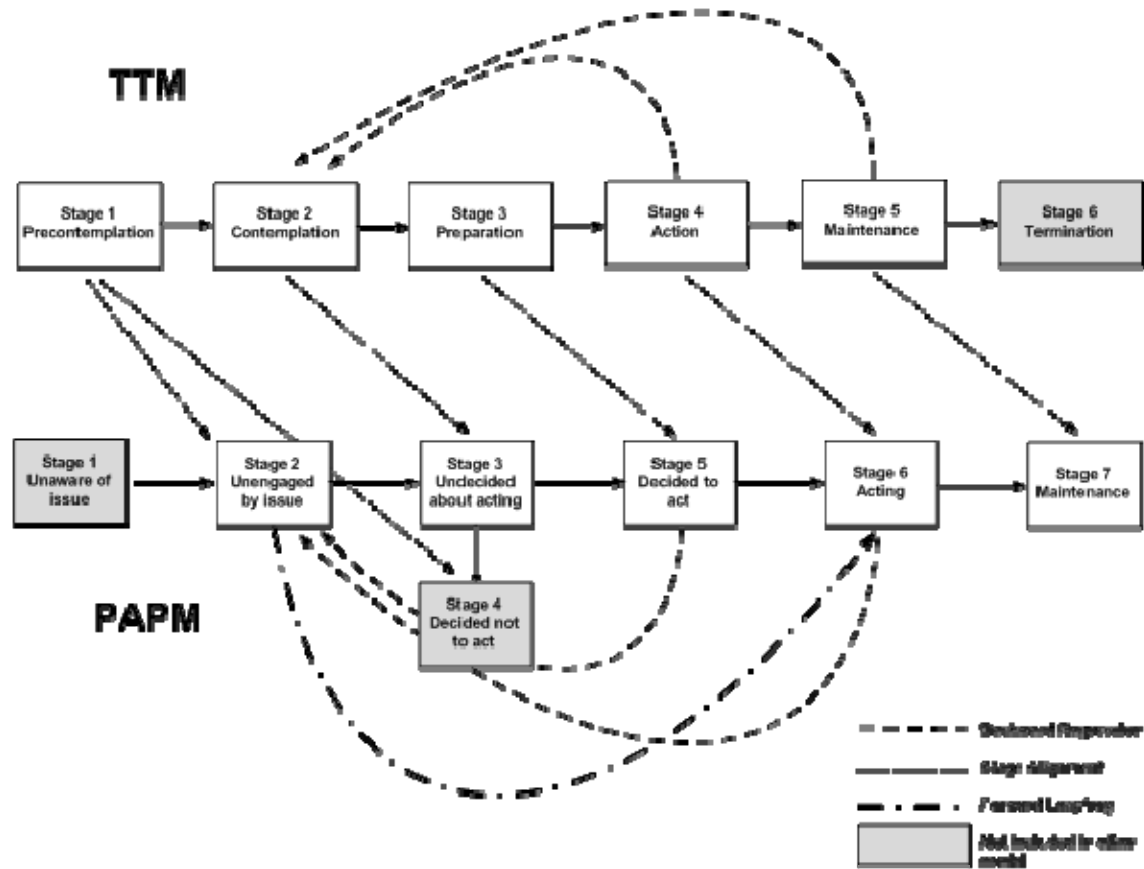


Figure 31. PAPM to TTM Comparison

An examination of the alignment across the two models reveals the final difference in the theories. The Precontemplation stage of the TTM aligns itself with two of the PAPM stages, the Unaware Stage and the Unengaged by the Issue Stage. It has been previously argued that the mindset of an individual who is unaware of an issue is different than one who is aware but unengaged. These two individuals, arguably, could be motivated to a higher stage by distinctly different interventions (Weinstein & Sandman, 1992). For example, an individual who unknowingly lives on an earthquake fault line or in a flood zone could be moved to the next stage, or beyond, by simply informing them of the hazard, whereas an individual who is more consumed with the cost of living and local

crime rate then to be concerned about preparing for an earthquake or flood would require a much different intervention in order to be motivated to a higher stage.

As mentioned previously, the TTM does not account for those individuals who have made a decision not to act. These individuals are typically well informed of the issue and may be exceedingly difficult to dissuade (Weinstein, 1992). As stated by Weinstein, “Certainly people who have come to a definite position on an issue—especially an issue regarding their own behavior—will be more resistant to persuasion than people who have never formed an opinion.” The PAPM does provide a stage for this individual (Stage 4).

Although not a difference in the construction of the model, the method of assigning stages to the target population differs across the models. In the TTM, there are three methods of measuring stages (Sutton, n.d.). The two most complex methods, according to Sutton, are the multi-dimensional questionnaire and the Contemplation Ladder. These instruments can be quite lengthy and complex. The third method utilizes a staging algorithm or a self-categorization. An example of a TTM staging algorithm for adult smoking is shown in Figure 32.

```
graph TD
    Q1[Are you currently a smoker?] --> A1[Yes, I currently smoke]
    Q1 --> A2[No, I quit within the last 6 months (Action Stage)]
    Q1 --> A3[No, I quit more than 6 months ago (Maintenance Stage)]
    Q1 --> A4[No, I have never smoked (Nonsmoker)]
    A1 --> Q2["(For Smokers Only) In the last year, how many times have you quit smoking for at least 24 hours?"]
    Q2 --> A5["Yes, within the next 30 days (Preparation Stage)"]
    Q2 --> A6["if they have one 24-hour quit attempt in the past year – refer to previous question...if no attempt (Contemplation Stage)"]
    A5 --> Q3["(For Smokers Only) Are you seriously thinking of quitting smoking?"]
    Q3 --> A7["Yes, within the next 6 months (Contemplation Stage)"]
    Q3 --> A8["No, not thinking of quitting (Precontemplation Stage)"]
```

Are you currently a smoker?

- Yes, I currently smoke
- No, I quit within the last 6 months (Action Stage)
- No, I quit more than 6 months ago (Maintenance Stage)
- No, I have never smoked (Nonsmoker)

(For Smokers Only) In the last year, how many times have you quit smoking for at least 24 hours?

(For Smokers Only) Are you seriously thinking of quitting smoking?

- Yes, within the next 30 days (Preparation Stage)
- if they have one 24-hour quit attempt in the past year – refer to previous question...if no attempt (Contemplation Stage)
- Yes, within the next 6 months (Contemplation Stage)
- No, not thinking of quitting (Precontemplation Stage)

University of Rhode Island Cancer Prevention Research Center (2008)

Figure 32. TTM Staging Algorithm for Adult Smoking (from University of Rhode Island Cancer Prevention Research Center, 2008)

The PAPM does not utilize a complicated survey instrument. The only measurement tool utilized for PAPM staging, according to Sutton (n.d.) is a staging algorithm. Weinstein, Sandman & Blalock (2008) claim that the determination of staging is so simple, it could be accomplished with a simple show of hands. Although not an effective or valid means of determining staging when the issue or behavior is of a personal or sensitive nature, it does underscore the simplicity with which staging can be accomplished. Figure 33 illustrates a simple algorithm that could provide staging information for a community carbon monoxide prevention program. This type of inquiry could quickly and inexpensively be undertaken via a questionnaire by most preparedness planners to gather community staging information.

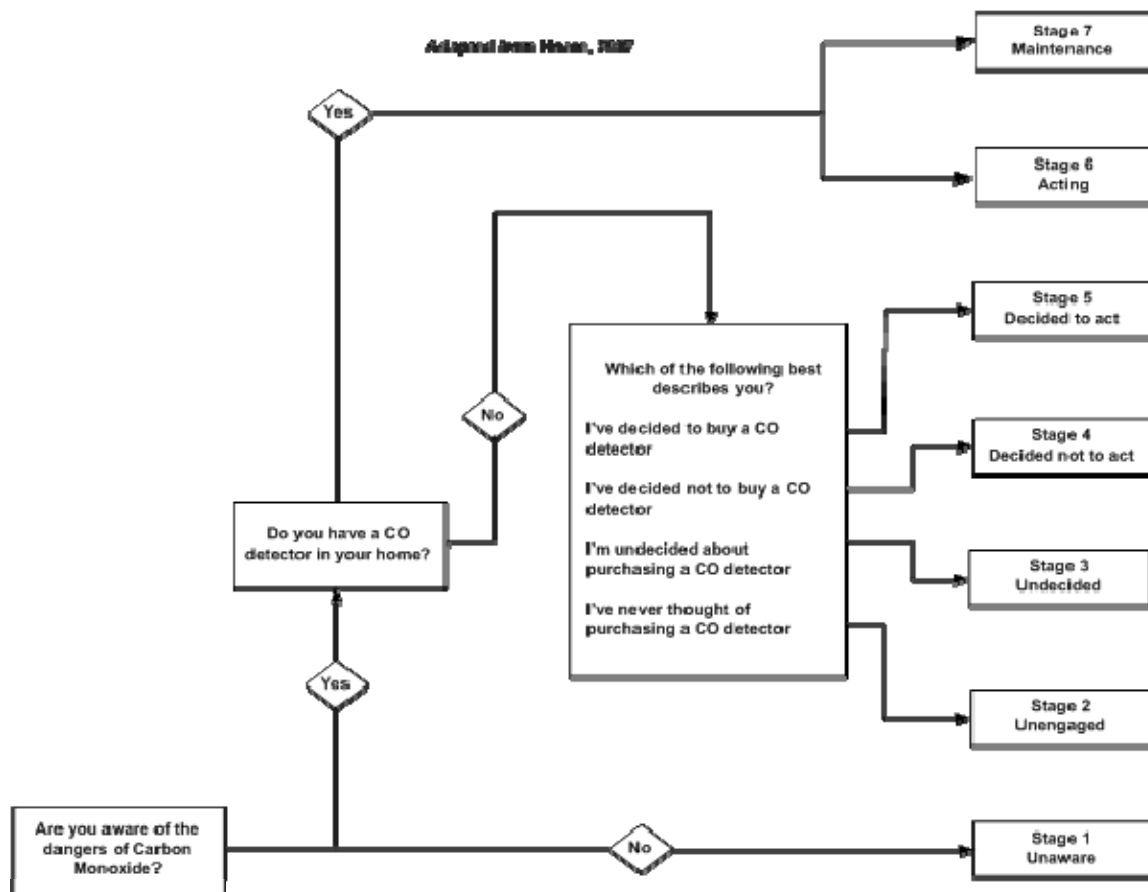


Figure 33. PAPM Staging Algorithm (after Hoare, 2007)

5. Limitations

One area the Precaution Adoption Process Model suffers from is the lack of ability to stage an individual who may have tried but failed to act (Sniehotta et al., 2005; Weinstein, Sandman & Blalock, 2008). Additionally, behaviors that may constitute a degree of achievement, such as eating a healthy diet or exercising more, are difficult to stage. As put by Weinstein, Sandman and Blalock (2008), “If someone has made only partial progress toward a goal—such as eating five servings a day of fruit and vegetables—should she be grouped with people who have made no dietary change or with people who consume the recommended five servings a day, or should there be a separate category of action that is under way but incomplete?” This limitation was echoed by Sniehotta et al., when they questioned the potential need to expand sub-groups in their study during a livestock epidemic. Their study showed that the PAPM did not provide a place for individuals who may have reduced their meat intake, but not to the degree they may have wished for. The further study of stage location for continuous behaviors such as this was suggested (Sniehotta et al.).

In the Ohio radon experiment, Weinstein and colleagues (2003) found that the combination interventions (Interventions 1 and 2) moved individuals from one stage to another just as the matched interventions did, which could lead one to question the necessity of providing separate interventions to each stage. Logically, it would be much simpler to utilize one combination intervention than multiple targeted ones. The researchers countered these sentiments by explaining that combination interventions are much longer (and more expensive) than single targeted messages. Additionally, the researchers found evidence that individuals may not pay attention to the portions of the intervention message that did not match their stage. This would require additional interventions, at a later time, to motivate them beyond the initial stage movement. These additional interventions would effectively negate the perceived advantage of a combination intervention. Finally, the experiment indicated that the motivation effect seen by the combination intervention was greatest among the Undecided to Act stage.

Weinstein et al. (2003) reported the effect seen among people in the Decided to Act stage was negligible, so the effect of combination versus targeted interventions may not be seen equally across all stages.

The greatest limitation of the Precaution Adoption Process Model is its lack of empirical test history. There is not a wealth of studies to solidify the theoretical basis of the model. de Vet et al (2008) stated that there had not been enough longitudinal studies on stage predictors performed and more study needed to be conducted. They acknowledge, however, that the principle developers point out the PAPM should be used as a framework with the factors that influence stage transitions filled in for the specific behavior being studied (de Vet et al.). Sutton (2005) in his commentary against the Transtheoretical Model advanced the PAPM and the Perspectives on Change Model as “promising alternative” models. He stated, “In contrast to the TTM, both these theories are based on a thoughtful analysis of the process of behavior change, but neither has been tested extensively” (Sutton, 2005).

Utilizing the PAPM within a community preparedness model would require additional research into the specific barriers influencing movement between stages of that behavior. However, as pointed out by Weinstein, Rothman and Sutton (1998) there have been some variables identified that appear to be valid across all stages. Examples of these are perceptions of personal vulnerability (movement from Stage 3 to Stage 5) and situational obstacles (Stage 5 to Stage 6) (Weinstein, Rothman and Sutton, 1998).

6. Conclusion

Stage theories of behavior change offer the promise of identifying and addressing the specific obstacles encountered along the path that individuals move when changing behaviors. The Precaution Adoption Process Model, although relatively new and not yet vigorously tested, provides a system of determining a target population’s motivational mindset towards a recommended behavior and designing a matching intervention.

Unlike the Transtheoretical Model, the PAPM is not based on past behavior history or constrained by set time periods of intentions. The model considers only the

current mindset of the individual. The development of the model was focused on the adoption of precaution-type behaviors, rather than the elimination of addictive behaviors.

Due to these and other previously discussed differences, the Precaution Adoption Process Model will be utilized in a proposed community/individual preparedness change model. This model will be discussed in the following sub-chapter.

B. THE COMMUNITY/INDIVIDUAL INTEGRATED MODEL

Wills, Ainette, and Walker (2007) defined social influence as the “health-related behavior influenced by a person’s social context.” When developing campaigns to promote complex behavior changes, such as disaster preparedness, guidance models must take these influences into account. Bourque and Mileti (2008) described the “monkey see, monkey do” mindset, which their study showed motivated individuals to behave as they observed their neighbors and friends behaving. Utilizing multiple behavior change theories is a common method used to address the multiple factors that may influence a set of target behaviors. As stated in the National Cancer Institute’s (2005) *Theory at a Glance* monograph, “Practitioners can find that using more than one theory to address a problem produces a stronger impact. This is particularly true when planning comprehensive health promotion programs that address multiple levels (e.g., individual, organizational, community) of a health problem.” The Community/Individual Integrated Model (CIIM) presented here, is a multi-theory model, proposing to integrate the Community Readiness Model’s (Plested et al., 2006) community level change model with the Precaution Adoption Process Model’s (Weinstein, Sandman & Blalock, 2008) individual level focus (Figure 34).

COMMUNITY/INDIVIDUAL INTEGRATED MODEL - CIIM

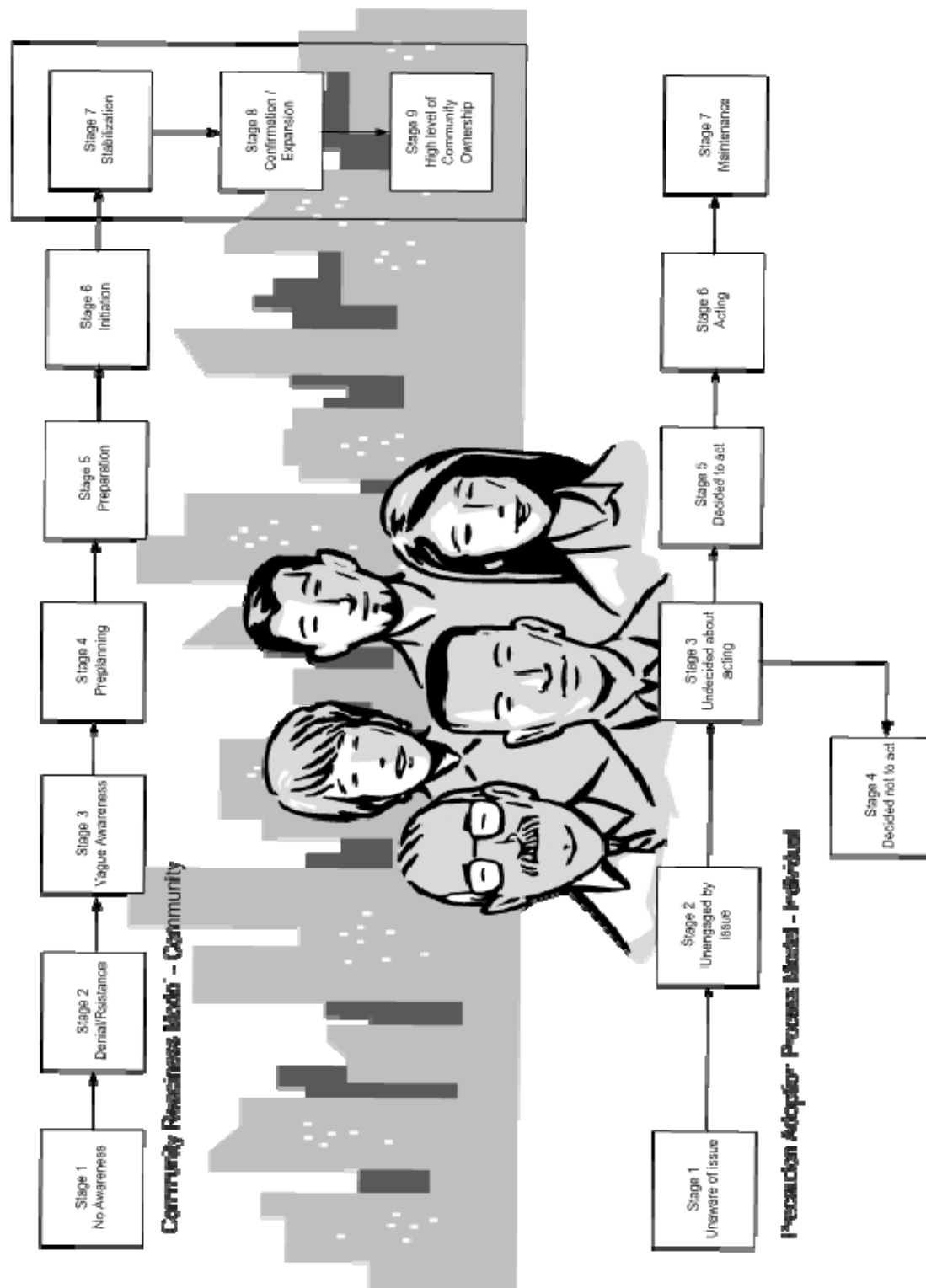


Figure 34. The Community/Individual Integrated Model—CIIM

1. Community/Individual Behavior Change Factors

As described in Chapter IV, there are multiple community level factors that influence behavior at the individual level. Rules, regulations, policies, social networks, subjective norms and the intrapersonal relationships with family, friends and close associates, combine together to exert the “social influence” described by Wills et al. (2007) that help to shape an individual’s behavior. The Community/Individual Integrated Model addresses these social influences by attacking behavior change from both a top down “System” (Thompson & Kinne, 1990) approach and a bottom up individual approach.

By utilizing the Community Readiness Model, a systems approach to behavior change can be implemented by involving community leaders, formal and informal community groups, and the various “subsystem” sectors, as described by Thompson and Kinne (1990), into the change effort. The Community Readiness Model measures the target community’s “readiness” for change at the system and subsystem level, allowing preparedness planners to focus interventions at a readiness stage appropriate level. By way of example, it would make no sense providing efficacy oriented information to a community that was unaware of a hazard-related issue.

Figure 35 illustrates the relationship between the Community Readiness Model and the “systems” perspective as described by Thompson and Kinne (1990). The interventions associated with the CRM are focused at the community entities enveloped by the dotted line. As explained by Thompson and Kinne, changes initiated at these levels, particularly at the community leader level, will accelerate the change process and spread rapidly throughout entire community.

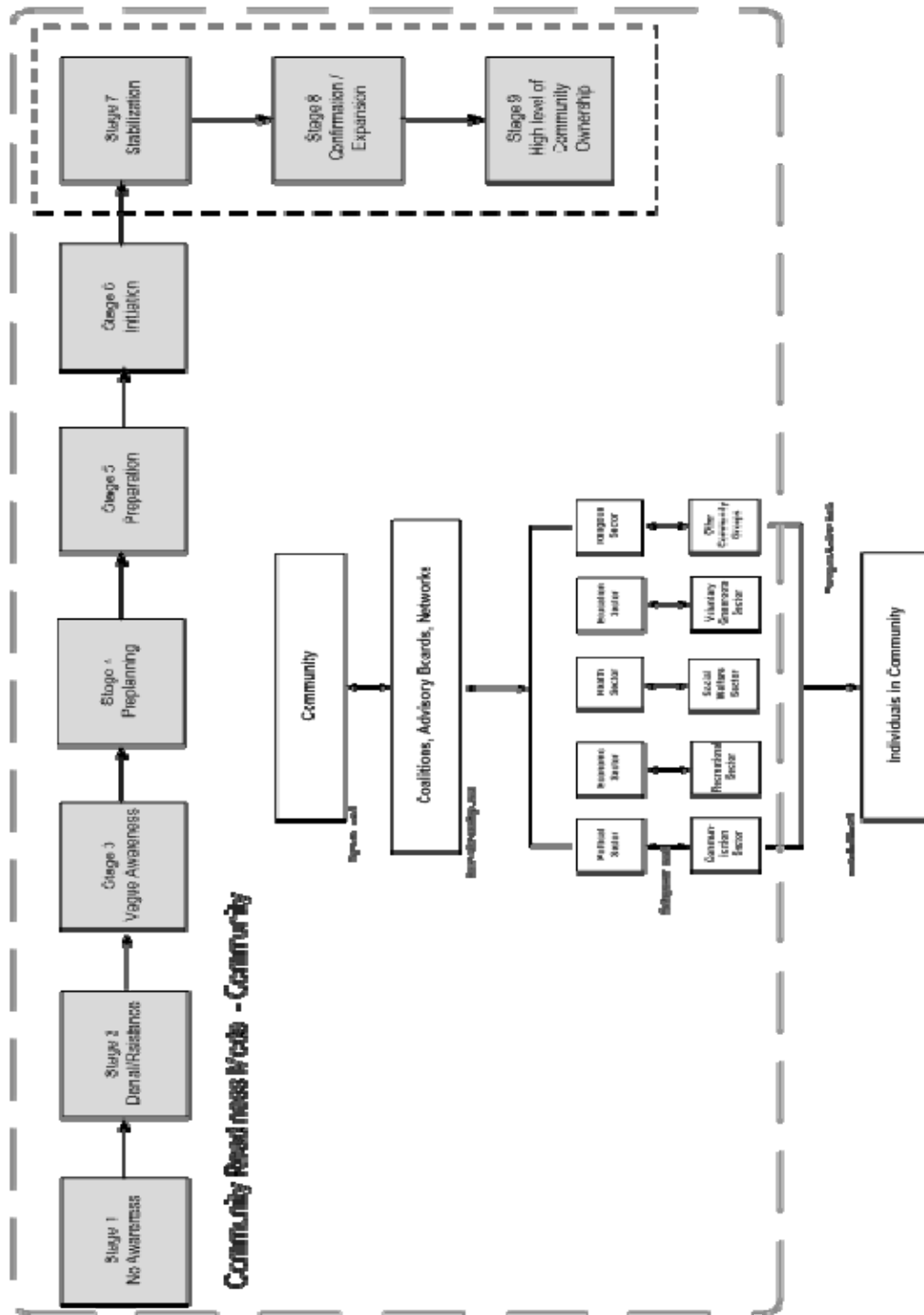


Figure 35. The CRM's Approach to Behavior Change

Figure 36 illustrates the relationship between the Precaution Adoption Process Model and the same “systems” perspective. The overlap into the subsystem level is deliberate in the diagram and reinforces the social influence those sectors have on individual behaviors. While the interventions associated with the PAPM would not be targeted to those sectors, they would, however, have to take those factors into account and recognize the influence they have on individual behavior.

A 1999 study by Ludwig and Geller demonstrates the power of integrating multiple levels of social influence on an individual’s behavior. In their study to promote increased levels of seatbelt usage in the community, the researchers utilized a multi-level intervention approach. For their experiment, they utilized pizza deliverers as the focus of the behavior change intervention.

The experimental program was set up in a community pizza store (Store A) and enlisted all of the pizza deliverers. Another pizza store (Store B) in a neighboring town was utilized as a control and was not involved with the safety program. Radio station public service announcements provided information to the public that the store’s deliverers wanted to see resident’s buckled up on the community’s streets. Special seatbelt reminder cards were made and pasted to the top of the store’s pizza boxes. The cards were designed so that they could be removed from the boxes and hung from the customer’s automobile rear view mirror.

Pizza deliverers, who while on the road, spotted a vehicle displaying the reminder card, would record the vehicle’s license plate number and relay it to the local radio station. Local law enforcement was also involved with the program, allowing its officers to record license plate numbers of vehicles they spotted sporting the safety cards. Periodic on-air announcements of license numbers spotted with the cards was provided by the radio station and individuals who heard their license number announced could stop at the station and receive a free pizza voucher.

Additionally, incentives were created for customers who, when ordering a pizza, asked the dispatcher to remind the deliverer to use their seatbelt. In this case, a large BU

(Buckle Up) was written on the pizza box and when delivered, the customer received a \$1 discount on the order. The notation on the box was plainly visible to the drivers and provided an added cue for them to use their seatbelt.

Results for this study were gathered from both telephone interviews and direct observation of pizza deliverers (Ludwig & Geller, 1999). The initial baseline mean of seatbelt usage among pizza deliverers was 57 percent. That percent increased, during the intervention, to 75 percent and follow-up observations showed a maintenance level of 74 percent (Ludwig & Geller). Store B had a baseline usage of 53 percent, which increased to 58 percent during the intervention period (Ludwig & Geller).

The intervention in this experiment utilized multiple levels of influence. The pizza deliverers' co-workers, such as dispatchers and other drivers, provided verbal cues to action, radio station announcements of license numbers they recorded reinforced seatbelt behavior, local law enforcement participated, and customers, when redeeming their discount coupons, added additional feedback for their behavior (Ludwig & Geller, 1999). This example illustrates the multi-level interventions that the CIIM advocates.

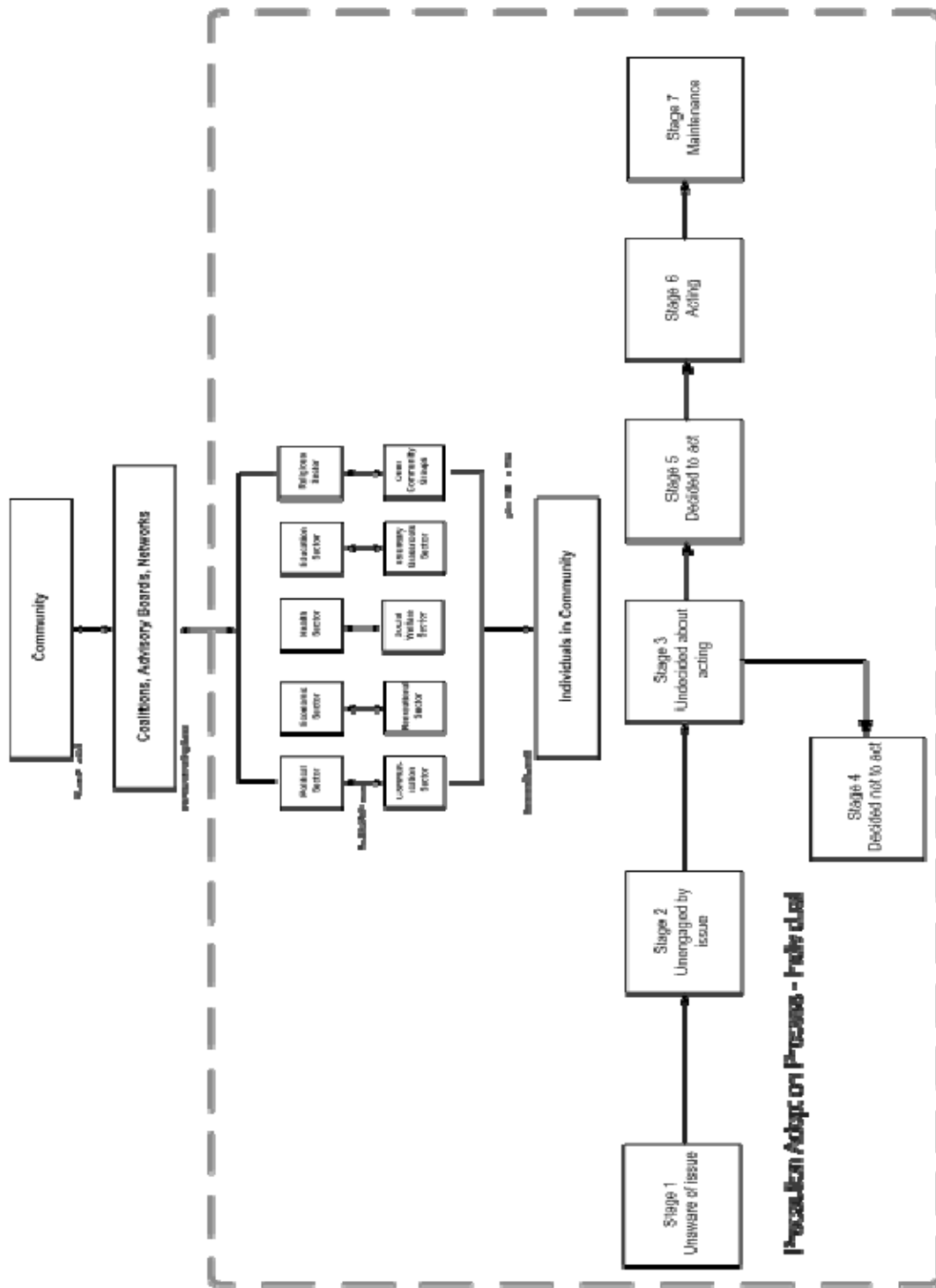


Figure 36. The PAPM's Approach to Behavior Change

2. Alignment of Community/Individual Stages

In the Citizen Corps' PDP Model, the Extended Parallel Process Model was used as the underlying intervention. Its independent variables (threat and efficacy) were modified and applied across several of the Transtheoretical stages of change (ORC Macro, 2006). The CIIM does not advocate a specific intervention method. While general guidance is provided, the intervention method used is left up to the preparedness development individual or team. Specific interventions should be chosen for their ability to fit the individual or community stage and then be tailored to the specific characteristics of the community, individual and issue being addressed.

The CIIM provides for two measurements of "stage;" the first is a community level indication of the stage of readiness for change and the second is an assessment of an individual level of change state. These two models can be combined to illustrate their complementary nature. Figure 37 shows the CIIM and how the two stage models interact with each other.

This diagram should not be construed to mean that a community whose readiness level is measured at one stage would indicate a similar level of stage for all of its inhabitants. For the reasons previously discussed in earlier chapters, individual behavior change is influenced by many factors and there will always be a dispersion of people at various stages of change. However, if the community segmentation has been well identified with a resulting homogeneous population, it is logical to believe that a good portion of the community may be at a similar stage.

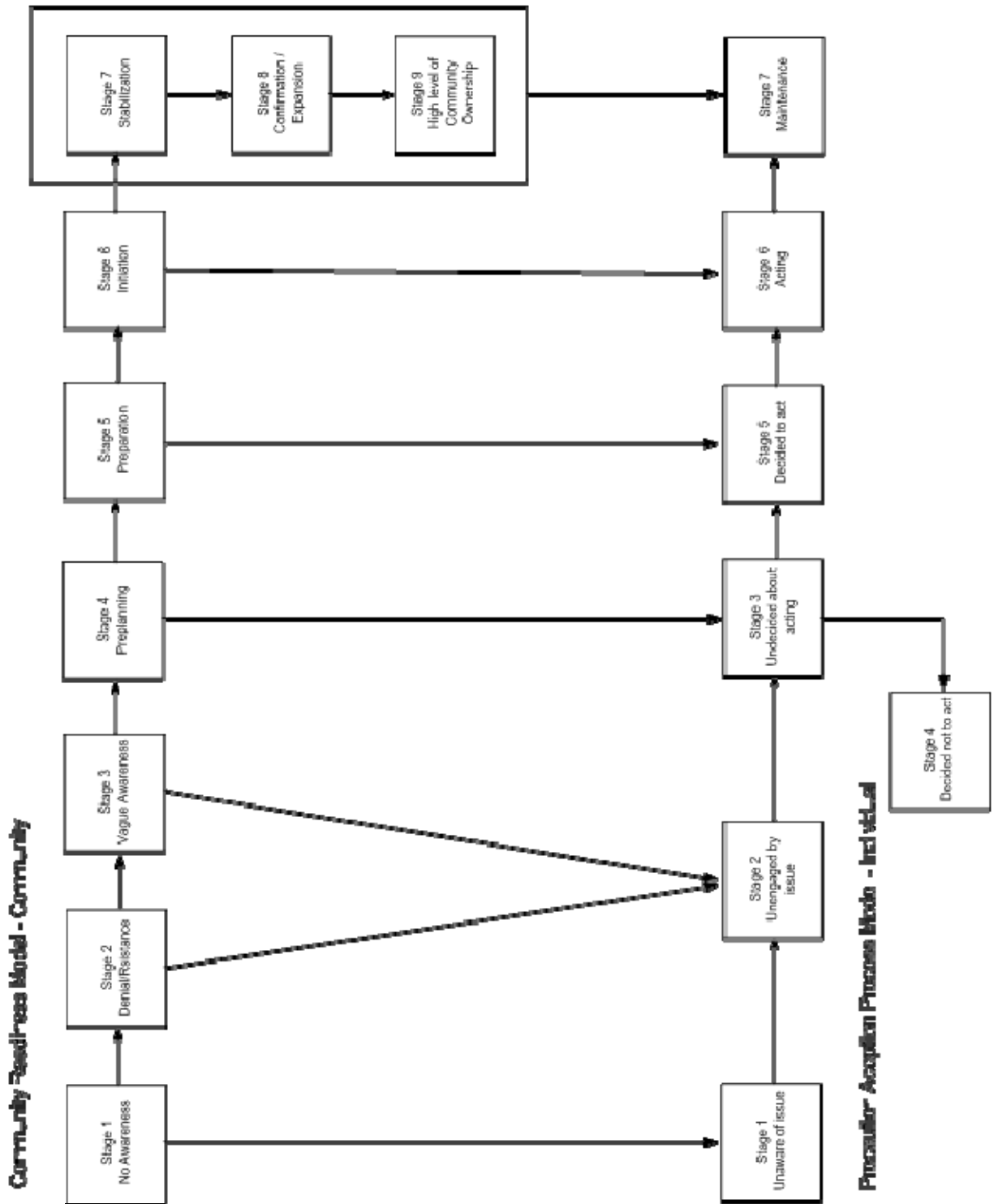


Figure 37. Community/Individual Integrated Model

An example of this would be a community that is unaware of a particular hazard that exists and threatens its population. It would be logical to expect that both the community and most of its population would be at the No Awareness (CRM) and Unaware of Issue (PAPM) stage, respectively. If the hazard was discovered by several residents and they began taking action to protect themselves, one would expect to see a segment of the population advancing along the PAPM stages while the community, as a whole, remained in the No Awareness stage.

At some point in time, if members of the community, who are aware of the hazard, banded together to bring the hazard to the attention of community leaders, one would begin to see the awareness of the community begin to creep forward. When the community, as a system, began to tackle the problem, one would expect to see the CRM stage of readiness move upward, as well as, a corresponding movement through PAPM stages as more individual community members become aware of the hazards and take protective steps. What was once an aligned model, when both the community and its residents were in an unaware stage, became misaligned during the beginning period of awareness and action. The two models should later move towards closer alignment as both the community and its population work together to address the hazard at hand.

The goal of the CIIM is to measure the stage differences between community and individual, in respect to emergency preparedness, and develop interventions that will assist the movement towards both action and ultimately the maintenance stages of preparedness behavior. Figure 38 highlights some of the stage specific interventions recommended by the CRM (Plested et al., 2006) to help with that movement.

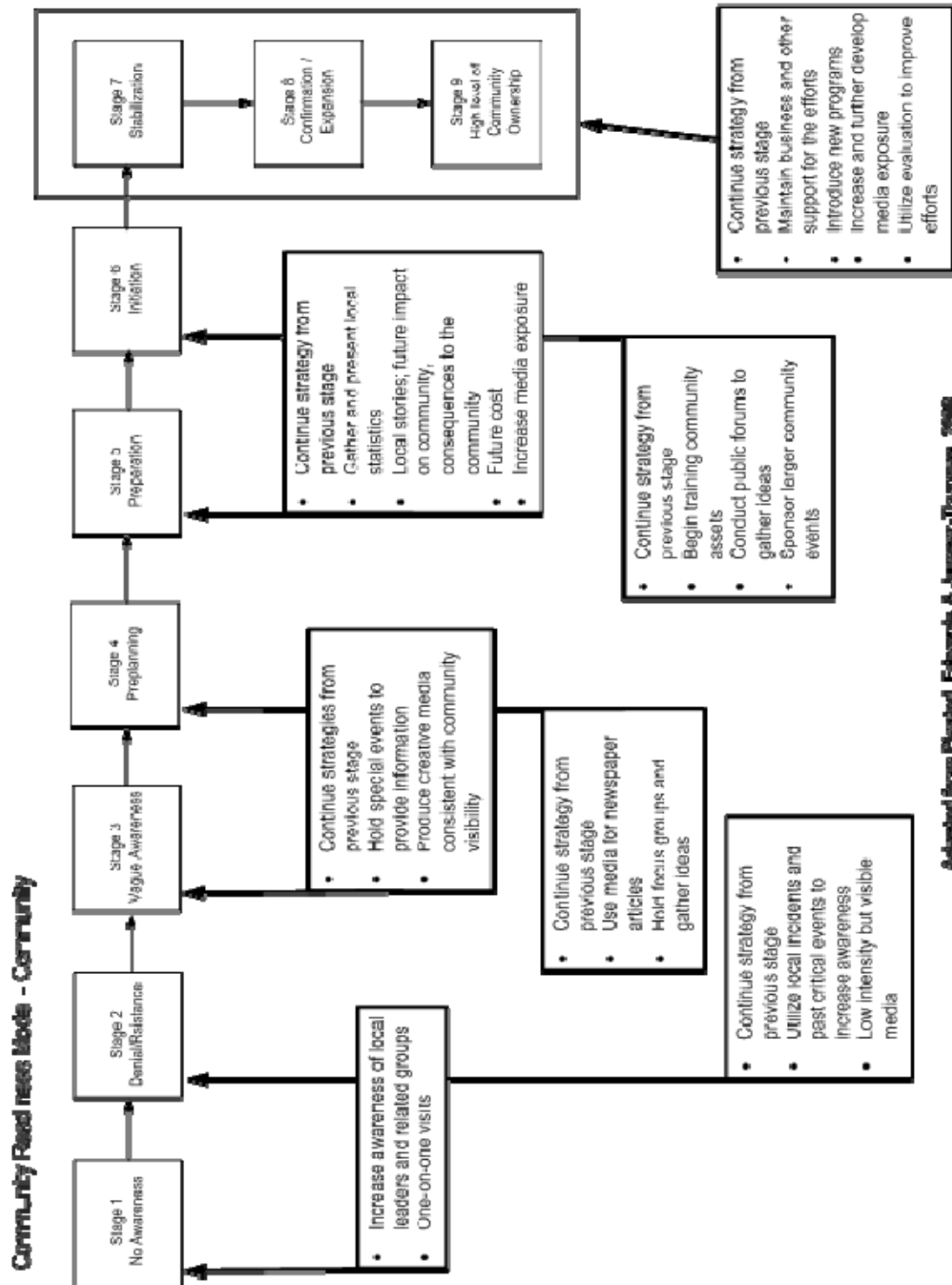


Figure 38. CRM Stage Specific Interventions (after Plested et al., 2006)

The PAPM does not provide users with a list of interventions. Rather it identifies some of the variables attributed as barriers to progressing to later behavioral stages. Figure 39 highlights several of the variables listed by de Vet et al (2008) that influence movement and Dietz (2005) that can assist with progress. In their home radon studies, Weinstein, Lyon, Sandman and Cuite (2003) explained, “By categorizing people who had not yet acted into distinct subgroups, the Precaution Adoption Process Model helped us to identify important barriers to action.” Weinstein & Sandman (2002) do acknowledge that perceived susceptibility appears to be the “one variable that frequently differentiates among people who have decided to act, those who are undecided and those who have decided not to act” Weinstein, Sandman and Blalock (2008) provide some broad generalizations about the interventions needed to motivate people in the four stages of inaction (Stage 1 through 4):

One value of the PAPM is its recognition of differences among the people who are neither acting nor intending to act. People in Stage 1 (Unaware), Stage 2 (Unengaged), Stage 3 (Undecided), and Stage 4 (Decided not to act) all fit in this broad category. Those in Stage 1 need basic information about the hazard and the recommended precaution. People in Stage 2 need something that makes the threat and action seem personally relevant. Individualized messages and contact with friend and neighbors who have considered action should help these individuals move to the next stage. Another powerful influence on the transition from Stage 2 to Stage 3 is probably the awareness that others are making up their minds, that one is obliged to have some opinion on this current issue of the day.

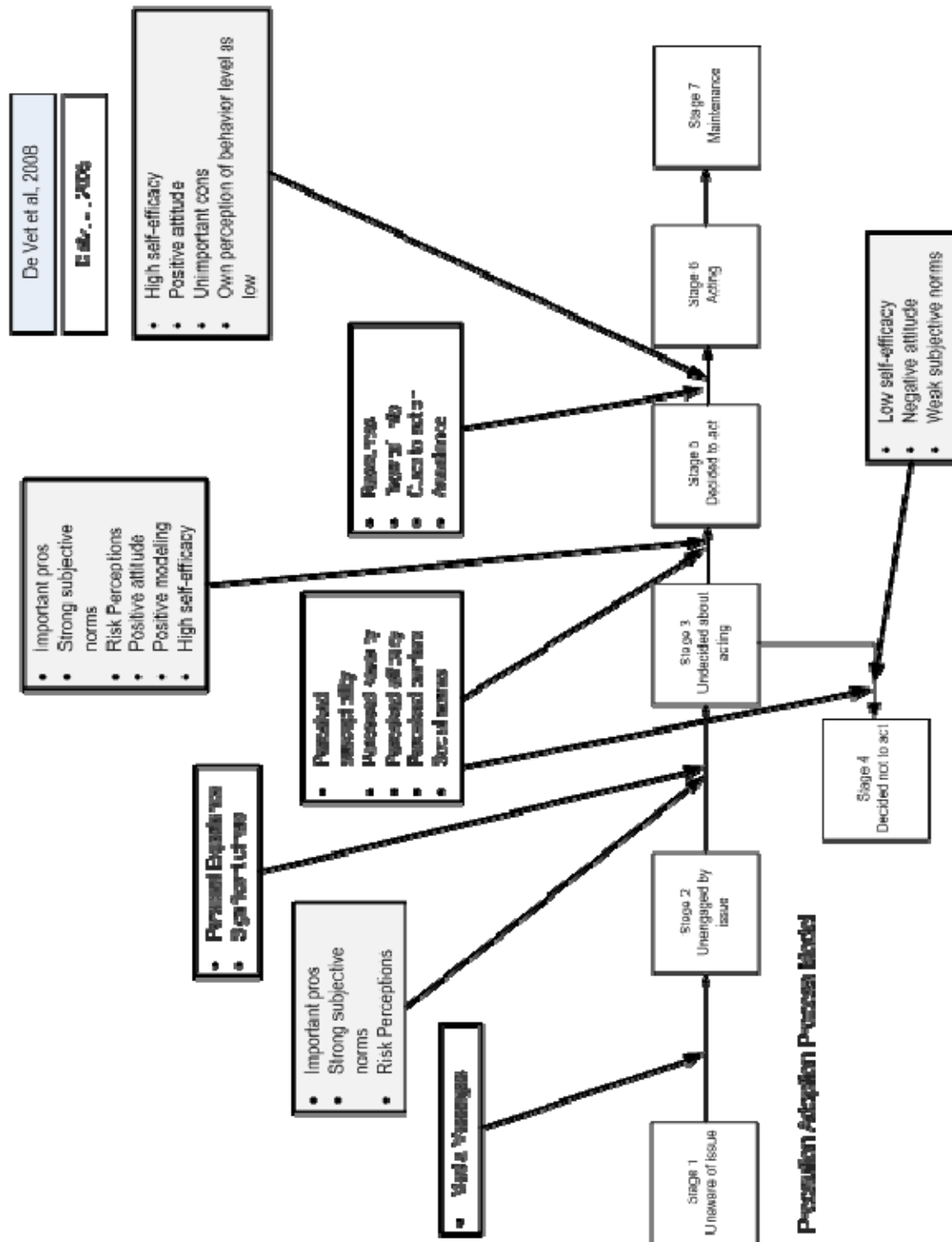


Figure 39. Factors Influencing Movement between Stages

3. Putting the CIIM to Work

Implementing the CIIM will require foresight and advance planning. York and Hahn (2007) indicated, “Communities need to be carefully examined for their current stage of readiness, as well as what strategies would be most effective in advancing their readiness...” At the core of initiating a CIIM program would be proper segmentation of the target population. When dealing with the CRM portion of the model, this segmentation will result in the identification of the key informants needed to determine the community’s readiness stage. When discussing community definition for assessment purposes Jumper-Thurman et al (2003a) noted, “Community readiness is a general theory that applies successfully to any group, but it makes most sense as an intervention method when applied to a reasonably focused target audience and focused on a specific issue.”

For community readiness determination, key informants should be identified and a Community Readiness Assessment performed (Plested et al., 2006). Individual level stage determination should be accomplished through survey instruments. Once completed, a comprehensive picture of the community should emerge; indicating both the degree of readiness for change at the “system” level and the population’s division among individual stages of change. Specific interventions and strategies, at both the individual and community level, can then be targeted and focused towards the identified stages.

The use of this model should provide the preparedness planner with a tool that accounts for the multiple factors influencing an individual’s behavior. By recognizing those influences from both a systems level, as well as, an individual level, more comprehensive and effective programs can be developed.

VI. CONCLUSION

A. FINDINGS AND RECOMMENDATION

Preparedness of our civilian population has been a national concern and, as such, has been incorporated into our national strategy. (USDHS, 2002) As numerous surveys have indicated low levels of preparedness on the part of our citizens, emergency preparedness planners have been searching for ways to improve preparedness levels. Out of this effort to increase public preparedness, the Citizen Corps Personal Behavior Change Model for Disaster Preparedness has been advanced as a “tool to help design successful outreach/social marketing approaches and as a framework to conduct further research into the motivating factor and barriers to personal preparedness” (ORC Macro, 2006).

Through examination of the PDP Model and its two underlying theoretical behavior change models, the Extended Parallel Process Model and the Transtheoretical Model, the following limitations have been identified:

- Based on several recent national surveys (FEMA, 2009; Kano, Wood, Mileti & Bourque, 2008), the effectiveness of utilizing perceived risk as a motivation for behavior change has been questioned,
- The TTM method of classification of stages is constrained by the use of time frames and past intentions of action,
- The use of a single EPPM fear appeal formula (Threat X Efficacy = Fear/Danger Control) across multiple stages of the TTM effectively negates the need for a stage model,
- The FEMA (2009) study of national preparedness did not find a correlation between the predicted behavior of low efficacy individuals and actual survey results,

- The FEMA (2009) study of national preparedness did not find consistent alignment of high threat/low efficacy individuals in the TTM Preparation stage. The large numbers of HT/LE individuals in the Precontemplation, Contemplation, Action and Maintenance stages suggested a misalignment of the EPPM and TTM behavior change models.

The most serious shortcoming of the PDP is the lack of recognition of the many community and social influences in shaping individual behavior. One aspect of this social influence was identified by Bourque and Mileti (2008) in their presentation, Public Response to Terrorism in America, in which they spoke of the power that friends and family members have on individuals who witness them partaking in preparedness activities.

In light of these identified shortcomings, a new model has been recommended that incorporates a top down “systems” approach, as well as, a bottom up individual approach to preparedness behavior change. By integrating the Community Readiness Model and the Precaution Adoption Process Model, a coordinated preparedness program can be developed that utilizes the power of the community and its inhabitants to create behavior change. As stated by Jumper-Thurman, Edwards, Plested and Oetting (2003b), “When the community readiness model is used to enhance readiness, people can develop good ideas about culturally valid ways to move their community to the next stage”.

The National Response Framework states, “Resilient communities begin with prepared individuals and depend on the leadership and engagement of local government, NGOs, and the private sector” (USDHS, 2008). That opening introduction serves to explain the local community leadership and subsystem sectors’ role in developing a prepared community. Approaching preparedness in an ad hoc manner with catchy slogans and public service announcements will not create the “Culture of Preparedness” called for by our National Strategy for Homeland Security (USDHS, 2007b). It is suggested that, through the use of the Community/Individual Integrated Model, a coordinated and matched approach between an individual and his/her community can develop a

preparedness program that maximizes social relationships and moves the entire community, not just individuals, through the stages of change.

B. LIMITATIONS AND AREAS FOR FUTURE RESEARCH

The CIIM is based on two relatively new behavior change theories. Weinstein, Lyon, Sandman and Cuite (2003) admit that there is much research that needs to be performed in order to confirm the validity of the PAPM model. They state, “It is still possible that precaution adoption model can be explained by a continuous equation, although this equation would have to be quite complex if some variables increase in importance and some decrease in importance depending on the values of still other variables” (Weinstein, Lyon, Sandman, & Cuite 2003). Future empirical testing of both models, when integrated into a community preparedness program will be needed to validate its effectiveness.

A limitation of the PAPM is the difficulty in applying its stage theory to more complex behaviors or behavior-related goals. The behaviors that are most readily identifiable by PAPM stages are those of a simple nature, such as installing a carbon monoxide detector. These actions are dichotomous in nature and, as explained by Weinstein, Sandman and Blalock (2008) should be how planners define their program stages. Staging determination of individuals who have partially achieved a goal is problematic under the current stage configuration. In a preparedness program, for example, staging of an individual who has prepared a home emergency plan but not yet assembled supplies for self-sufficiency may be difficult. As Weinstein et al. (2008) points out, there may be need for additional stages to account for partial or past behaviors. They conclude that further research will be needed to answer these questions.

An additional limitation is the PAPM does not come pre-loaded with a list of barriers or factors that prevent the movement by individuals between stages. These influencing factors are left up to researchers and plan implementers to determine. An area of future preparedness research that would improve the effectiveness of the CIIM would be to determine and assemble a comprehensive list of such barriers associated with preparedness behaviors. A collection of the various social and individual level barriers

assembled in program guidance documents, along with theoretical intervention models for each class of barriers, could greatly assist local preparedness planners.

The effectiveness of the Community Readiness Model relies on an accurate delineation of community, whose population shares a common interest, culture and needs. Kelly et al. (2003) reminds us that if large, diverse metropolitan areas are to be included in programs; identifying smaller homogeneous communities within the larger parent community should be done, with targeted interventions directed at the smaller regions. Nilsen (2006), when discussing community-based health and safety programs in general, echoed those warnings, “Programs to a great extent define geographical or geopolitical units as communities. However, because these entities can be highly heterogeneous and be characterized by a weak sense of community, it can result in insufficient community mobilization and inadequate reach for many programs.”

The fact that the resources required to perform this segmentation may be intensive and challenging, could present a potential limitation of the CIIM. Performing key informant interviews are relatively simple and fast, however, when coordinating multiple smaller community interviews, which make up a larger geographical region, the resources and time needed for interviews can be considerable. Future research into the development of a written key informant survey instrument, similar in nature to the one developed by Beebe et al (2001), for their community readiness study in alcohol, tobacco and other drug use, would reduce the labor and time considerations required for the assessment. Additionally, a fast, simple and inexpensive key informant survey would allow for the assessment of a larger number of informants. This would eliminate the criticism of the interview process as described by Beebe et al., that the assessment may represent the view of a few, vocal minority versus the community as a whole. Utilizing technology and developing a Web-based survey tool would simplify the process even further.

An area of future research that could capitalize on the segmentation of communities/individuals by stages would be that of tailored print communication. Rimer and Glassman (1999) discussed its use in relation to cancer risk communication and described the increased effectiveness this media may have if targeted towards a specific

group of similar individuals, such as those within a particular stage of the PAPM. As the authors state, “This tailoring is especially appropriate when models such as Precaution Adoption are used” (Rimer & Glassman, 1999). While the true tailored communication, as described by the authors, is designed with a singular person in mind, research into the effectiveness of communication focused on stage-specific groups should be examined.

The nature of Community Readiness interventions is such that they work at an optimum level when undertaken by a collaboration of multiple community levels (Kelly et al., 2003). A potential limitation to a CRM approach is that changes at the policy level of the community may be difficult or sensitive, especially when the desired stage changes occur over extended periods of time. Political players may change and policy initiatives may change in importance complicating forward progress. York and Hahn (2007) suggest that there may be a need for a seventh readiness dimension called “political climate.” The themes they suggest including in this dimension are, “possibility of preemption, effects of elections, political champions, issue framing, other policy issues having precedence, accessibility to elected officials, and turf disputes among elected officials” (York and Hahn, 2007). This is an additional area for future research.

Current preparedness programs have failed to engage the public at the community level. Bach and Kaufman (2009) stated, “Americans have not been engaged in the kind of joint-decision making and cooperative planning for homeland security that fully engages local communities.” The CIIM is an integrated model that advocates a community-oriented approach to community preparedness planning. Initiating an integrated community readiness and individual stage-based assessment could be both time consuming and labor intensive. Mobilizing multiple community sector levels, organizations and leaders into functioning action groups to identify barriers and develop interventions will not occur overnight. However, the benefits derived from a successful community/individual campaign could far outweigh the costs.

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APPENDIX

Goals and General Strategies Appropriate For Each Stage of the Community Readiness Model

(Plested et al., 2006)

1) No Awareness

- a) **Goal:** Raise awareness of the issue
- b) Make one-on-one visits with community leaders/members.
- c) Visit existing and established small groups to inform them of the issue.
- d) Make one-on-one phone calls to friends and potential supporters.

2) Denial / Resistance

- a) **Goal:** Raise awareness that the problem or issue exists in this community
- b) Continue one-on-one visits and encourage those you've talked with to assist.
- c) Discuss descriptive local incidents related to the issue.
- d) Approach and engage local educational/health outreach programs to assist in the effort with flyers, posters, or brochures.
- e) Begin to point out media articles that describe local critical incidents.
- f) Prepare and submit articles for church bulletins, local newsletters, club newsletters, etc.
- g) Present information to local related community groups.

(Note that media efforts at the lower stages must be lower intensity as well. For example, place media items in places where they are very likely to be seen, e.g., church bulletins, smaller newsletter, flyers in Laundromats or post offices, etc.)

3) Vague Awareness

- a) **Goal:** Raise awareness that the community can do something

- b) Get on the agendas and present information at local community events and to unrelated community groups.
- c) Post flyers, posters, and billboards.
- d) Begin to initiate your own events (pot lucks, potlatches, etc.) and use those opportunities to present information on the issue.
- e) Conduct informal local surveys and interviews with community people by phone or door-to-door.
- f) Publish newspaper editorials and articles with general information and local implications.

4) Preplanning

- a) **Goal:** Raise awareness with concrete ideas to combat condition
- b) Introduce information about the issue through presentations and media.
- c) Visit and invest community leaders in the cause.
- d) Review existing efforts in community (curriculum, programs, activities, etc.) to determine who the target populations are and consider the degree of success of the efforts.
- e) Conduct local focus groups to discuss issues and develop strategies.
- f) Increase media exposure through radio and television public service announcements.

5) Preparation

- a) **Goal:** Gather existing information with which to plan strategies
- b) Conduct school drug and alcohol surveys.
- c) Conduct community surveys.
- d) Sponsor a community picnic to kick off the effort.
- e) Conduct public forums to develop strategies from the grassroots level.
- f) Utilize key leaders and influential people to speak to groups and participate in local radio and television shows.

- g) Plan how to evaluate the success of your efforts.

6) **Initiation**

- a) **Goal:** Provide community-specific information
- b) Conduct in-service training on Community Readiness for professionals and paraprofessionals.
- c) Plan publicity efforts associated with start-up of activity or efforts.
- d) Attend meetings to provide updates on progress of the effort.
- e) Conduct consumer interviews to identify service gaps, improve existing services and identify key places to post information.
- f) Begin library or Internet search for additional resources and potential funding.
- g) Begin some basic evaluation efforts.

7) **Stabilization**

- a) **Goal:** Stabilize efforts and programs
- b) Plan community events to maintain support for the issue.
- c) Conduct training for community professionals.
- d) Conduct training for community members.
- e) Introduce your program evaluation through training and newspaper articles.
- f) Conduct quarterly meetings to review progress, modify strategies.
- g) Hold recognition events for local supporters or volunteers.
- h) Prepare and submit newspaper articles detailing progress and future plans.
- i) Begin networking among service providers and community systems.

8) **Confirmation / Expansion**

- a) **Goal:** Expand and enhance services
- b) Formalize the networking with qualified service agreements.

- c) Prepare a community risk assessment profile.
- d) Publish a localized program services directory.
- e) Maintain a comprehensive database available to the public.
- f) Develop a local speaker's bureau.
- g) Initiate policy change through support of local city officials.
- h) Conduct media outreach on specific data trends related to the issue.
- i) Utilize evaluation data to modify efforts.

9) High Level of Community Ownership

- a) **Goal:** Maintain momentum and continue growth
- b) Maintain local business community support and solicit financial support from them.
- c) Diversify funding resources.
- d) Continue more advanced training of professionals and paraprofessionals.
- e) Continue re-assessment of issue and progress made.
- f) Utilize external evaluation and use feedback for program modification.
- g) Track outcome data for use with future grant requests.
- h) Continue progress reports for benefit of community leaders and local sponsorship. At this level the community has ownership of the efforts and will invest themselves in maintaining the efforts.

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