

# **Awareness and Motivation in Collaborative Practice for Disaster Management**

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by

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### **Abstract**

Disasters are prevalent worldwide and there is a need to engage high-risk populations in collaborative disaster management activities to improve resilience that is inclusive of the whole community (Enarson, & Walsh, 2007). It is clear from extant literature that awareness has a supportive influence on collaboration, however there is need for a better understanding of how this interaction activates action toward collaborative disaster management activities (Mendoza et al., 2014; Na, Okada, & Fang, 2009), especially for high-risk populations (Enarson, & Walsh, 2007). Thus the purpose of this study was to understand how awareness activated individuals to collaborate in the EnRiCH asset-mapping task, to engage high-risk populations in disaster management activities and improve community resilience in future disasters. In this study we used qualitative content analysis to analyze audio-recorded semi-structured interviews to identify concepts and emergent themes. Self-Determination Theory (Deci & Ryan, 2008) and the ED Model of Awareness (Kuziemsky & O'Sullivan, under review) were used as a framework for the study. Findings and elements of Self-Determination Theory were used to expand the ED Model of Awareness to demonstrate how awareness motivates collaborative action. This study concludes that awareness influences the psychological needs of competence and relatedness, both positively and negatively in different contexts, to motivate individuals toward collaboration and sustained action. This is depicted in the extended ED Model of Awareness and Action to demonstrate how awareness is situated in the interaction between the psychological needs, motivation, and collaborative action.

## **CHAPTER 1: Introduction**

### ***1.1 Background***

Disasters and emergency situations are increasing worldwide and have substantial impacts on affected populations (Hales, Walzer, & Calvin, 2012; Prashar, Shaw, & Takeuchi, 2012). Risk can be mitigated by adopting a ‘whole-of-society’ approach that engages all sectors of society, from government to the general public, to participate in disaster preparedness and response (FEMA, 2011; WHO, 2013). In particular, collaboration among disaster planners and high-risk populations is important for comprehensive disaster response that is inclusive of the entire community (Burke, Bethel, & Britt, 2012; Chandra et al., 2011; Enarson, & Walsh, 2007; Falconi, Fahim, & O’Sullivan, 2012; Kailes, & Enders, 2007; Norris et al., 2008; Sullivan, & Häkkinen, 2011).

In this study, high-risk populations are defined as those prone to adverse outcomes during natural disasters and chemical, radiological, nuclear and explosive (CBRNE) events because of functional limitations that affect ability to cope independently (Burke, Bethel, & Britt, 2012; Enarson, & Walsh, 2007; Kailes, & Enders, 2007; O’Sullivan & Bourgoïn, 2010; Prashar, Shaw, & Takeuchi, 2012; Sullivan, & Häkkinen, 2011; Uscher-Pines et al., 2009). This definition is intentionally broad, as high-risk populations may require support for a range of diverse user needs including: medical requirements, transportation, functional independence, communication, and supervision (Kailes, & Enders, 2007). Some examples (not exhaustive) of high-risk groups include people who are: affected by acute or chronic physical/mental disabilities, economically disadvantaged, visible minorities, pregnant, children, elderly, homeless, in

the criminal justice system, people who do not have access to a vehicle, tourists, immigrants, and refugees; this list also involves people with lower literacy levels and people for whom English is not their first language (Enarson, & Walsh, 2007; Kailes, & Enders, 2007; Sullivan, & Häkkinen, 2011). Given this diversity, the literature related to provision of support is increasing to ensure inclusion of high-risk populations in disaster planning and response (Enarson, & Walsh, 2007; Kailes, & Enders, 2007; Sullivan, & Häkkinen, 2011).

Collaboration in disaster management activities between planners, individuals who are at high-risk, and advocacy groups can help identify strengths and improve resilience; thus it is important for disaster management officials to encourage participation (Akompab et al., 2013; Bihari & Ryan, 2012; Enarson, & Walsh, 2007; Kailes, & Enders, 2007; Prashar, Shaw, & Takeuchi, 2012). However, despite the importance of collaboration, it is challenging to motivate people and organizations to participate in disaster management activities (Burke, Bethel, & Britt, 2012; Cave et al., 2009; Uscher-Pines et al., 2009; Na, Okada, & Fang, 2009), making it crucial to determine what factors resonate and prompt action.

Awareness has a supportive influence on collaboration in complex tasks and contexts (Burke, Bethel, & Britt, 2012; Carroll et al., 2006; Coulston & Deeny, 2010; Mendoza et al., 2014; Na, Okada, & Fang, 2009; Prashar, Shaw, & Takeuchi, 2012; Reddy & Spence, 2008; Wu et al., 2013). However there is a need for better understanding of awareness and how it may activate community participation in collaborative disaster management activities (Mendoza et al., 2014; Na, Okada, & Fang, 2009), particularly those that integrate high-risk populations into disaster planning and

response (Enarson, & Walsh, 2007), as the link between being aware and taking action is currently unclear (Cave et al., 2009; Kuziemsky & Varpio 2011; Mendoza et al., 2014; O'Sullivan et al., 2012a; Scolobig, De Marchi, & Borga, 2012; Pelletier & Sharp, 2008).

In this study, the ED Model of Awareness (Kuziemsky & O'Sullivan, under review) was used in combination with Self-Determination Theory (Deci & Ryan, 2008) to examine how awareness activates collaborative action in a disaster management asset-mapping activity. This preliminary model focuses on the interaction and outputs of awareness across three levels of analysis: micro, meso, and macro (Kuziemsky & O'Sullivan, under review). Self-Determination Theory has been used to investigate different aspects of motivation and their relation to behaviour in a variety of settings, however to our knowledge it has not been applied to disasters (Barbeau, Sweet, & Fortier, 2009; Deci & Ryan, 2008; Ng et al., 2012; Vallerand, Koestner, & Pelletier, 2008). This theory is appropriate for exploring how awareness activates collaborative action through various motivators, and can contribute to the ED Model of Awareness to include underlying motivational elements.

### ***1.2 Research Questions and Objectives***

The objective of this study was to investigate how awareness activates collaborative action by identifying motivators that prompt individuals to participate in a collaborative asset-mapping task. The overarching research question for this study is:

How does awareness activate an individual toward collaboration in a disaster management asset-mapping task and sustain action?

More specific research questions were developed to provide detail to the broader question. The first research question focuses on how awareness of the asset-mapping task

initially prompts individuals (representing the micro level) to participate in the collaborative meso level activity. The second research question focuses on understanding how awareness motivates further participation in activities that generate more awareness and aid in preparedness and response. The final research question looks at how awareness enhanced by the asset-mapping exercise serves to improve overall community disaster resilience (macro level).

1. What are the drivers of motivation stemming from awareness that initially bring people together to collaborate in an asset-mapping task?

Objective: To identify motivators resulting from awareness that prompt individuals to collaborate in inclusive disaster management asset-mapping.

2. How does awareness generated through the asset-mapping task activate individuals to continue to collaborate in activities at the meso level?

Objective: To identify motivators driven by awareness to maintain collaborative activities and encourage further awareness to be generated.

3. How does the interaction between awareness and motivation to collaborate influence community resilience at the macro level?

Objective: To gain understanding of how awareness links to action, and potential proxy indicators for community or organizational resilience.

### ***1.3 Thesis Outline***

A literature review is presented in the next chapter, followed by Chapter 3, which describes the methodology used to collect the data and the analysis process. Chapter 4 presents the results found in this study. The results are then related to current literature and limitations are presented in Chapter 5. Finally, Chapter 6 provides a discussion of potential areas of future research and further recommendations. References cited in this thesis are included in Chapter 7. Finally an interview guide, additional supporting quotations, additional analysis information, an ethics certificate, and a glossary are presented in the appendices.

## CHAPTER 2: Literature Review

This section presents a review of the literature on Disaster Resilience, Awareness, Collaboration, Asset-mapping, and Self-Determination Theory in the context of disaster management. The search was conducted using the Scopus database with the following key search terms: “Disaster Management”, “Disasters OR Emergencies”, “High Risk OR Vulnerable”, “Resilience”, “Whole of Society”, “Awareness”, “Common Ground”, “Collaboration”, “Asset-Mapping”, “Self-Determination Theory”, “Motivation”, “Action.” These terms were used to locate data to provide a comprehensive review of the evidence base for these topics. Initial terms were selected using previous knowledge and after scanning the literature and observing use in other articles, the list was expanded as the search progressed. Manual searches and review of grey literature sources are also included in this review.

**Table 1. Example of searches**

1. Whole of Society AND Disasters AND Resilience
2. Awareness AND (Disasters OR Emergencies) AND Health AND (Vulnerable OR High Risk)
3. Awareness AND Collaboration AND Action AND Disasters
4. Awareness AND Disasters AND (Vulnerable OR High Risk)
5. (Awareness OR Common Ground) AND (Preparedness OR Resilience) AND Disasters AND (Vulnerable OR High Risk)
6. Disasters AND Asset-Mapping
7. Asset-Mapping AND Collaboration
8. Self-Determination Theory AND Motivation AND Disasters AND Collaboration

### ***2.1 Disaster Resilience***

Disaster resilience is a process involving the ability of a community to withstand crisis, recover efficiently, and rebuild toward a state of improved functioning (Chandra et al., 2011; Norris et al., 2008; Pfefferbaum, Pfefferbaum, & Van Horn, 2011). Resilience on a micro or individual level is connected to a community, as assets available within each person play a larger role when shared and properly allocated (Chandra et al., 2011; Norris et al., 2008). Furthermore, disasters impact all levels of a community. Thus it is important for every member to take responsibility and action to prepare and respond (FEMA, 2011; Gamboa-Maldonado et al., 2012; Prevent Project, 2011; WHO, 2013).

The ability to act is variable within a community, for example high-risk populations may not have the capacity to take action without the aid of others (Chandra et al., 2011; Norris et al., 2008). However they should be encouraged to act when able and take preparedness steps to assemble necessary disaster supports (Chandra et al., 2011; Norris et al., 2008). A “whole-of-society” approach to disasters encourages planners to recruit multiple stakeholders including, government, the health sector, non-health sector units, civil society organizations, families, and individuals (FEMA, 2011; Prevent Project, 2011; WHO, 2013). When people are aware of the risks, available services, and assets in their community it contributes to their capacity to make decisions regarding their own preparedness and involvement with disaster activities (O’Sullivan et. al., 2013b). Thus investigation of awareness and collaborative action are important in promoting resilience (Chandra et al., 2011; Norris et al., 2008). However the link between awareness and participation in collaborative activities needs further explanation (Mendoza et al., 2014; Na, Okada, & Fang, 2009).

## **2.2 Awareness**

Dourish and Bellotti (1992, p. 107) define awareness during collaboration as an “understanding of the activities of others, which provides context for your own activity.” Furthermore awareness “involves knowing who is ‘around’, what activities are occurring, who is talking with whom; it provides a view of one another in the daily work environments” (Dourish & Bly, p. 541). Other researchers expanded upon these concepts to investigate more specific aspects of awareness.

Riley et al. (2006) discusses situational awareness as the mindfulness of critical elements such as strengths, weaknesses, and needs, surrounding an immediate or closely approaching event. This knowledge is used to make decisions, plan courses of action, efficiently respond, and accomplish goals.

Carroll et al., (2009) discuss that awareness is a concept with multiple dimensions that can be further differentiated depending on the context in which it is defined. They add further distinctions by describing activity awareness, which is more focused than situational awareness; it involves being knowledgeable of all elements surrounding a specific collaborative task. This includes participant awareness of an activity and knowledge of the skills, motivations, and limitations of everyone else, in order to best work as a team.

Kuziemy and Varpio (2011) outline four types of awareness as part of team collaboration. ‘Patient awareness’ concerns health status, needs, treatments, and goals. ‘Team member awareness’ falls under group awareness and includes being aware of member positions, roles, and skills. ‘Decision making awareness’ is about ensuring that individual perspectives are considered when making consensus decisions, and

‘environmental awareness’ includes both individual and group knowledge of physical infrastructure, policies, and communication mediums.

It is important to note that awareness can occur at different points on a continuum over time, rather than a static state. Carroll et al. (2006) identifies that each type of awareness may be synchronous and happen in real time in order to understand an immediate situation. It may also occur asynchronously outside of instant interaction and consist of receiving information at different time points.

In reviewing and combining elements from different awareness definitions, it is apparent this is a multifaceted concept that may be defined as the knowledge that individuals or groups may possess or try to learn about a situation or activity to make decisions, provide support, and accomplish goals (Carroll et al., 2006; Carroll et al., 2009; Dourish & Bellotti, 1992; Dourish & Bly, 1992; Kuziemsky & O’Sullivan, under review; Kuziemsky & Varpio, 2011; Riley et al., 2006; Schmidt, 2002). In the context of emergency situations, awareness is non-linear, it influences many processes and is concurrently impacted by other factors through a variety of complex interactions (O’Sullivan et al., 2013a).

Collaboration is facilitated among individuals facing complex situations when there are multiple types of awareness present (Abell & Rutledge, 2010; Carroll et al., 2006; Carroll et al., 2009; Dourish & Bellotti, 1992; Dourish & Bly, 1992; Kuziemsky & Varpio 2011; Reddy & Spence, 2008; Riley et al., 2006; Wu et al., 2013). However as previously noted, there is a gap in understanding how awareness activates collaborative action before, during, and after disasters (Carroll et al., 2006; Cave et al., 2009; Mendoza et al., 2014; Na, Okada, & Fang, 2009; Scolobig, De Marchi, & Borga, 2012).

### **2.3 Collaboration**

Interprofessional collaboration is an essential activity in improving health outcomes. It is considered so important that the Canadian Interprofessional Health Collaborative (CIHC) was created to educate people on the essential facilitators to group work (CIHC, 2010). The CIHC defines collaboration as “the process of developing and maintaining effective interprofessional working relationships with learners, practitioners, patients/clients/families and communities to enable optimal health outcomes. Elements of collaboration include respect, trust, shared decision making, and partnerships” (CIHC, 2010, p. 8). It ranges from simple, containing clear steps and predictable outcomes, to complex, involving multiple challenges, uncertainty, and ambiguity (CIHC, 2010). The three C model of collaboration created by Ellis, Gibbs, and Rein (1991), and expanded upon by Fuks et al. (2007), indicates that collaboration involves three continuously interacting elements: Communication, coordination, and cooperation.

In the context of collaboration, communication consists of the exchange of information between people to support group work (Fuks et al., 2007). Communication is a critical component of collaboration because in complex situations people must be able to share information efficiently, have the ability to solve problems, and make decisions to allow for the best outcome (CIHC, 2010; Ellis, Gibbs, & Rein, 1991; Fuks et al. 2007; Pfefferbaum, & Van Horn, 2011). Interaction methods include: Face-to-face conversation, telephone, video conferencing, radio, television, email, instant messaging, SMS and MMS messaging (Bolstad & Endsley, 2005; Gurol-Urganci et al., 2012; Su, Cheng, Wang, & Lv, 2012).

Coordination links both communication and cooperation through the organization of collaborative activities. Fuks et al. (2007) identifies different elements that usually need to be coordinated, and their relation to the other two C's. For instance the coordination of people is dependent on communication. The coordination of resources focuses on cooperation in using a shared space, and the coordination of activities may require mobilization of both people and resources, and thus contain elements of communication and cooperation.

Effective coordinators create tasks that best support communication and cooperation; they also manage conflicts (Fuks et al., 2007). Conflict is a main collaboration barrier as disagreements may disrupt workflow (Abell & Rutledge, 2010; CIHC, 2010). Factors that are known to create conflict include: Miscommunication, competing goals, different perspectives, and lack of respect and trust (Abell & Rutledge, 2010; CIHC, 2010). As difficulties arise, it is essential that teams manage them constructively and develop solutions to remain focused (Abell & Rutledge, 2010; CIHC, 2010). This may be accomplished by utilizing conflict as an opportunity to enhance common ground, which is the sharing of needed knowledge between team members to improve collaboration through mutual understanding (Kuziemy, & Cornett, 2012).

Cooperation is the accomplishment of tasks by groups in a shared workspace. For groups to work effectively it is essential that the members support each other in needed tasks and take action to effectively make decisions (Fuks et al., 2007). Furthermore group members must respect, trust, and provide opportunities for equal participation to progress smoothly (CIHC, 2010; Kuziemy & Varpio, 2010). Sometimes when cooperation is not

taking place, renegotiation is needed and effective communication is critical to organize improved tasks (Fuks et al., 2007).

Awareness is needed to support collaborative activities (Ellis, Gibbs, & Rein, 1991; Fuks et al., 2007). In terms of disaster management, collaborative activities that involve the two-way exchange of knowledge between planners and the community empower participation (Mendoza et al., 2014). In all phases of a disaster (prevention/mitigation, preparedness, response and recovery), it is essential to reduce information inequities present in a community so that everyone may be informed and have the opportunity to act in a supportive collaborative manner (Mendoza et al., 2014).

Asset-mapping, discussed in the following section, is a strategy used in disaster management that requires application of collaborative principles and awareness of population strengths and opportunities for improvement, to enhance community resilience (Kretzmann & McKnight, 1996; Lemyre & O'Sullivan, 2013; Tupechka, Abbs, & Doherty, 2010). It is also an important tool that can be used to involve high-risk populations and incorporate diversity into disaster planning (O'Sullivan et al., 2013a; Pfefferbaum, Pfefferbaum, & Van Horn, 2011).

#### ***2.4 Asset Mapping***

Asset-mapping is a collaborative information gathering activity originating from the field of community development (Kretzmann & McKnight, 1996; Lemyre & O'Sullivan, 2013; Tupechka, Abbs, & Doherty, 2010). This method is used to create inventories of data regarding the skills and resources within communities and organizations, to improve awareness and empower participants (Fuller, Guy, & Pletsch, 2002; Goldman, & Schmalz, 2005). Data may be gathered through multiple methods

including: Key informant interviews, group meetings, surveys, and ecological and infrastructure maps (Cowan et al., 2010; O’Sullivan et al., 2013a; Pfefferbaum, Pfefferbaum, & Van Horn, 2011). This information may then be presented in the form of written documents, organized charts, or visuals depicting asset locations throughout a community (Fuller, Guy, & Pletsch, 2002).

This approach has been used in community resilience interventions, such as the Communities Advancing Resilience Toolkit (CART) and The EnRiCH Community Intervention, to identify strengths and reduce the negative impacts of disasters (O’Sullivan et al., 2013a; Pfefferbaum, Pfefferbaum, & Van Horn, 2011). Outcomes of this method include increased awareness of community strengths and diversity, enhanced integration of high-risk individuals into planning and response, the development of partnerships between emergency planners and high-risk populations, and improved resilience (Fuller, Guy, & Pletsch, 2002; Goldman, & Schmalz, 2005; O’Sullivan et al., 2013a; Pfefferbaum, Pfefferbaum, & Van Horn, 2011). Furthermore, this approach delivers a balanced view of the community by identifying existing supports and strengths, in addition to needs, which is preferable to methods such as needs assessments that focus mainly on deficiencies (Cameron, & Gibson, 2001; McKnight, 2013; Tupechka, Abbs, & Doherty, 2010). For asset-mapping to be effective, individuals must want to participate, underscoring the importance of understanding the motivational aspects of mobilizing a community toward collaborative action.

### ***2.5 Self-Determination Theory***

Self-Determination Theory (SDT) has been applied in multiple fields to improve understanding of the motivation behind people’s actions (Deci & Ryan, 2008). It has

been used in health promotion to encourage physical activity (Barbeau, Sweet, & Fortier, 2009), prevention and treatment of diabetes, and smoking cessation and abstinence (Ng et al., 2012), as well as education (Minnaert, Boekaerts, & De Brabander, 2007), and business management (Hon & Chan, 2013). SDT has also been used to investigate the influence of awareness on individual environmental action (Pelletier & Sharp, 2008); themes from such action may be applied to disaster management.

SDT is centered around three main universal psychological needs that must be satisfied in order for a person to feel self-determined, which enhances motivation toward a particular task. These needs are ‘autonomy’, ‘competence’ and ‘relatedness’ (Deci & Ryan, 2008). Autonomy is described as a person’s ability to have choice over what they want to do and to have a part in the decision-making about how it will be done. Autonomously motivated individuals identify with the value of a task and feel that their actions are self-endorsed. Competence is the feeling of confidence of being able to complete a task and do it well. Finally relatedness is the inherent sense of wanting to interact and belong with others. If all three of these elements are satisfied, a person will have the most beneficial results, such as a drive to complete their task and the ability to remain completely satisfied and healthy while doing so (Barbeau, Sweet, & Fortier, 2009; Deci & Ryan, 2008). However, generally the factors vary in the degree to which they are satisfied. This does not mean that a task will not be completed, but it does mean that an individual’s psychological satisfaction and functioning within a task may be decreased, which could influence the quality of the result (Deci & Ryan, 2008; Ryan, & Deci, 2001).

Deci and Ryan (2008) distinguish between both the type and quality of motivation affecting outcomes. ‘Autonomous motivation’, involves people choosing to complete a

task based on their own internal drivers. For example, one may be autonomously motivated to complete a task because they have an intrinsic passion for it. Autonomous motivation is associated with better persistence, performance and overall psychological well being when completing tasks. Whereas ‘controlled motivation’ occurs when external influences such as rewards or punishments cause someone to complete a task. For example, one may complete a task because of monetary incentives or because of requests from an employer. Each type of motivation is influenced by a specific category of rewards. ‘Intrinsic rewards’ come from within a person and coincide with autonomous motivation. An intrinsic reward is linked to an individual’s drive to complete a task out of enjoyment (Deci & Ryan, 2008). ‘Extrinsic rewards’ in contrast, focus on outside sources, such as money, trips, acknowledgments, peer pressure, etc. (Deci & Ryan, 2008). These rewards align more with controlled motivation and tend to diminish autonomous motivation (Deci & Ryan, 2008). In terms of awareness and collaborative disaster management, knowledge is necessary but it does not always guarantee participation (Mendoza et al., 2014). Therefore there is a need for further understanding of motivational mechanisms behind awareness and its influence on collaborative action.

## ***2.6 Summary of literature review***

This literature review acknowledges the broad impact of disasters and notes the importance of community participation in collaborative activities to improve engagement of high-risk individuals in disaster preparedness, response, and recovery activities.

Awareness is a multifaceted concept that is essential to supporting collaborative activities, however its link to activating action is not yet understood. Thus there is need

for investigation of the motivational elements stemming from awareness and how they activate an individual toward collaborative activities.

Collaboration is a complex process involving multiple professions and interactions to achieve goals. It includes communication, coordination, and cooperation and is supported by reciprocal information exchange. Asset-mapping is an inclusive collaborative activity that relies on awareness, collaboration, and participation to be successful. This tool is essential to disaster management and is useful in observing the interaction between awareness and motivation to collaborate. Self-Determination Theory is a highly validated, versatile framework, for investigating motivation and human behavior in relation to three psychological needs. Table 2 presents a summary of the identified literature gaps along with the research questions from this thesis to address them:

**Table 2. Literature Gaps**

What we know	What we don't know	Research questions to address gaps
Awareness is a multifaceted concept essential to supporting collaborative activities	How awareness initially motivates an individual (micro level) to participate in collaborative activities	What are the drivers of motivation stemming from awareness that initially bring people together to collaborate in an asset-mapping task?
	How awareness generated in meso level activities initiates and sustains activation	How does awareness generated through the asset-mapping task activate individuals to continue to collaborate in activities at the meso level?
Awareness and collaboration are essential to community resilience	How the interaction between awareness and collaborative action influences macro level resilience	How does the interaction between awareness and motivation to collaborate influence community resilience at the macro level?

## **CHAPTER 3: Methodology**

This thesis is a sub-study within The EnRiCH Project, which is a community-based participatory research project focused on enhancing community resilience and preparedness among high-risk populations (O’Sullivan et al., 2013a). The following sections introduce the EnRiCH intervention, methods of data collection and analysis, and the ED Model of Awareness.

### ***3.1 Interviews from EnRiCH case study***

The EnRiCH Project introduced an asset-mapping intervention in five Canadian communities (Truro, NS; Quebec, QC; Kitchener-Waterloo, ON; Gatineau, QC; Calgary, AB) to explore community resources that contribute toward disaster preparedness, and to provide opportunities to include and collaborate with organizations that support high-risk populations. This thesis analyzes personal interviews of the participants who were part of the EnRiCH initiative in Truro, Nova Scotia.

Truro is the third largest urban center in Nova Scotia with a population of approximately 12000 people, and is located 95 km north of Halifax. It has experienced floods and other disasters including Hurricane Juan in 2003 and White Juan in 2004. Given their experience with past events, this community has a rich history associated with disaster management.

### ***3.2 Intervention Protocol***

The EnRiCH team gathered data after receiving approval from the university research ethics board to recruit professionals and volunteers working in health, social services and emergency management. The study also focused on including organizations supporting high-risk populations, to better understand the assets and needs of this

population. Recruitment was achieved through purposeful and snowball sampling, as outlined by Creswell (2013) and each participant signed a consent form before taking part in any of the data collection. The intervention was comprised of two components, the first being an asset/needs assessment of the community, using the SIM facilitation technique to conduct the focus groups (O'Sullivan et al., 2013a; O'Sullivan et al., 2014). A SIM approach allows for the inclusion of multiple individuals (ideally 25-35) and promotes equal participation, making it preferable to the traditional focus group, which is why it was chosen for this project (O'Sullivan et al., 2014).

The same recruitment strategy was used for the second portion of the intervention, which was the collaborative asset-mapping exercise. This part of the intervention included three phases: 1) An orientation session designed to introduce the task, the asset-mapping tools, and hands-on practice; 2) a 10-week collaborative asset-mapping task where participants worked together to create a database of assets; and 3) a face-to-face table-top exercise (O'Sullivan et al., 2013a). During the orientation, participants were introduced to the CHAMPSS Functional Capabilities Framework (O'Sullivan et al., 2013c) and instructed on the use of Google Docs. They were then divided into small groups and asked to collaborate on an asset-mapping task using a template spreadsheet and Google Docs online collaborative tool. Following the first session, participants worked collaboratively for 10 weeks to populate the asset-mapping spreadsheet and determine, by consensus of the group, how the asset-database would be used to promote resilience and preparedness in their community. The tabletop exercise was held after 10 weeks of the asset-mapping task. This meeting required participants to work through disaster scenarios to assess and improve preparedness.

### ***3.3 Data Sources***

For this study, interview data gathered during the second portion of the intervention with the Truro community was used. Focus group data was also collected and the general findings of this process may be found in the intervention manual (O’Sullivan et. al., 2013a). The interview data was chosen to be the sole focus of this sub-study, as it provided in-depth data of participant thoughts on their experiences. In my role as a research assistant in the EnRiCH lab, I attended the final focus group and was directly involved in the transcription of the recordings, providing understanding of the context surrounding this intervention.

The dataset consists of 92 transcripts from semi-structured individual phone interviews collected at four different time points spaced four weeks apart (before, during and after the intervention) with a total of n=31 participants (n=26, n=22, n=10, n=23). Some participants completed all of the interviews; one person joined the study part way through, and some participants withdrew before all the phases were complete. Four additional participants were included in follow-up interviews (n=11) conducted six months after project completion. Each interview was 30-45 minutes in duration. The interview guide is presented in Appendix A. Some questions follow a ranked 1-5 scale (with 5 being the highest) while others were open ended. The same interview guide was presented over the five interviews, however additional probes were added throughout the process. The interviews were audio-recorded, transcribed verbatim and checked for accuracy by Dr. Tracey O’Sullivan, myself, and other members of the EnRiCH team.

The data from the participants who completed all interviews were analyzed first. This was followed by analysis of the rest of the data. A table of participation in the interviews is presented below:

**Table 3. Participant Attendance**

Participant	Interview 1	EHRIT	Interview 2	Interview 3	Tabletop	Interview 4	Maintenance Focus group	Maintenance interview
1	X				X	X	X	X
2	Withdrew prior to study							
3	X	X	X		X	X	X	X
4	X	X	X	X	X	X		
5	X	X	X	X	X	X		
6	Withdrew prior to study							
7	X	X	X	X	X			
8	X	X	X	X		X		
9	X	X	X		X			
10	X	X	X			X		
11	X	X			X	X	X	
12	X	X				X		
13					X	X		
14	X	X	X		X	X	X	X
15	X	X	X	X	X	X		
16	X	X	X		X	X		
17	Withdrew prior to study							
18	X	X	X		X	X		
19	X	X			X		X	
20	X	X	X			X		
21 (email)	X	X	X	X	X	X		
22	X	X	X	X	X	X	X	X
23	Withdrew prior to study							
24	X	X	X		X	X	X	X
25	X	X	X		X	X	X	
26	X	X	X		X	X	X	X
27	X	X	X	X	X	X	X	X
28	X	X	X	X				
29	X	X	X		X	X	X	
30	X	X	X		X	X		
31	X	X	X	X		X		
32							X	X
33	Withdrew prior to study							
34							X	X
35	Withdrew prior to study							

36							X	X
37	Withdrew prior to study							
38	Withdrew prior to study							
39	Withdrew prior to study							
40	Withdrew prior to study							
41							X	X

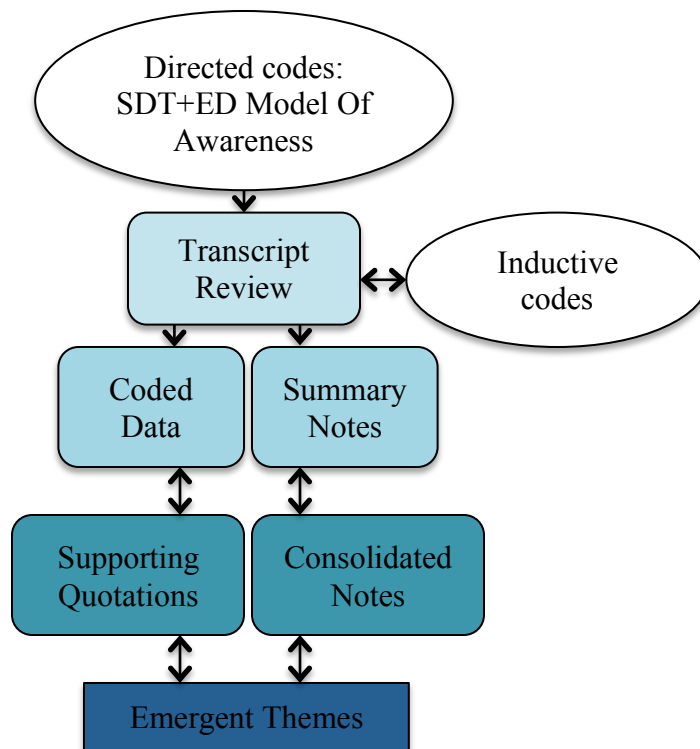
\*Participants who withdrew prior to the project had either participated in the previous SIM or were new to the study. They decided not to continue with the intervention because of personal choice or schedule conflicts.

### 3.4 Secondary Analysis & Coding Validation

Secondary analysis of the EnRiCH Truro interview dataset was conducted using qualitative content analysis, through a combination of directed and inductive coding (Hsieh & Shannon 2005). This method was chosen to incorporate existing theories with new data (Hsieh & Shannon 2005). Interview transcripts were read multiple times to understand the longitudinal changes in participant experiences and to identify emergent themes. Thus for each participant, transcripts were reviewed in order from the first interview onward.

A coding tree was developed using elements of Self-Determination Theory and the Ed Model of Awareness. This was then reviewed by my thesis supervisors and was refined through a consensus process. Summaries of responses from each participant were created to develop a synthesis, comparing patterns and themes.

The summaries of participant data were consolidated into one document allowing for the observation of emerging patterns. These summaries along with the coding reports were reviewed to identify emergent themes. The data was then reread to gather representative quotations, which are presented alongside the themes. Additional quotations for each theme may be found in Appendix B. The figure below depicts the overall steps taken in identifying emergent themes:



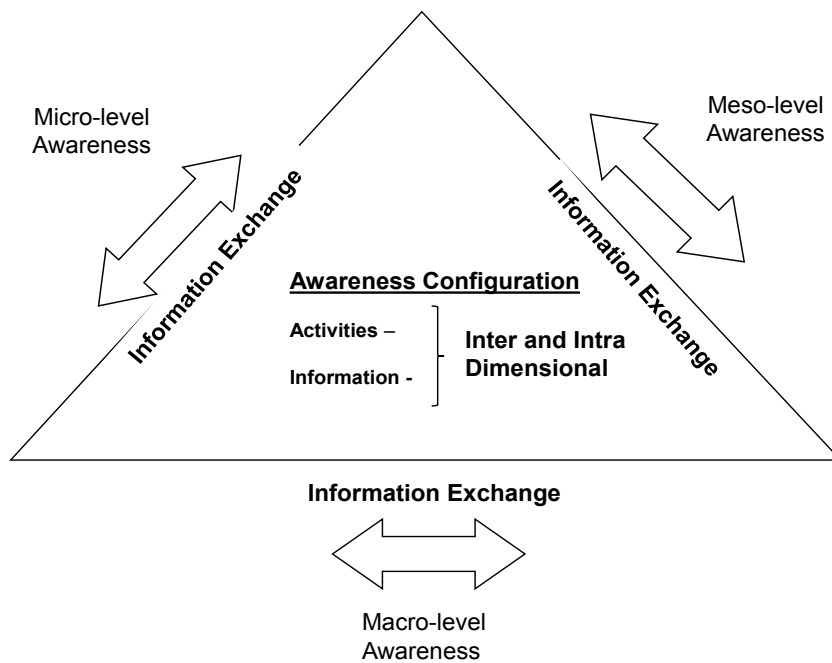
**Figure 2: Identification of Emergent Themes**

Feedback on theme development was provided through regular meetings and emails with my thesis supervisors, until consensus between all 3 team members was reached. For example, comments such as the one below helped guide the evolution of the themes: “My main comments on the results is that your themes are too dense – you need to make them more concise about a single issue that the theme represents. Then once you have defined single-concept themes you can piece them together to create more detailed inferences.” A detailed figure that further outlines the development of the themes can be found in Appendix C.

### ***3.5 Conceptual Framework***

Kuziemyky and O’Sullivan (under review) explored awareness across different socio-ecological levels during the asset/need assessment conducted as part of The EnRiCH Project. One outcome of their study was the creation of the ED Model of

Awareness (Fig. 1) that focuses on the presence of awareness across the micro, meso, and macro levels of society. In the current study, the three research questions were designed to extend this framework to gain an understanding of awareness and its activation of individuals toward collaborative practice.



**Figure 1: The ED Model of Awareness-Kuziemsy & O’Sullivan (under review)**

The ED model depicts the structure of awareness and how activities at each level of society serve to create awareness both intra (within one level) and inter dimensionally (between levels). The micro level contains both individuals and families. At this level, intra dimensional activities focus on people taking responsibility and becoming aware of personal disaster preparation and response steps, as well as resources available in their

community. Examples of intra dimensional awareness activities at the micro level include: identifying emergency requirements, investigating resource location and accessibility, and seeking education (Kuziemsky and O’Sullivan, under review).

The meso level includes interaction of teams and organizations. Intra dimensional activities involve group actions to increase awareness of a situation, such as continuity of operations planning and understanding how organizations integrate together before, during, and after a disaster. Group activities at this level can focus on gaining knowledge of community assets, creating inventories, and deciding how to allocate resources, to promote meso level awareness (Kuziemsky & O’Sullivan, under review).

The macro level is the broadest category that includes the overall community and organizations such as the government and international agencies. Intra dimensional activities focus on policy development and actions to support efficient response, such as education and training. The third research question pertains to this level of awareness through outcomes resulting from the interaction of awareness between the micro and meso levels.

There are two types of inter dimensional activities causing awareness to flow between levels. The first is ‘communities of practice’, which is similar to group awareness, as it refers to people learning about each others’ roles and becoming more integrated in a collaborative task. Communities of practice may be achieved through individuals participating in collaborative activities and providing personal background on community roles and available skills. The second type of inter dimensional activity, ‘knowledge translation’, refers to the influence of information as it is transferred between levels. For example, individual awareness generated at the micro level is transferred to

the meso level when individuals bring information to a group. Each team member's awareness at the micro level is altered as they acquire new information. This same concept works to transfer knowledge between the meso and macro level as groups collaborate with governments to improve support mechanisms, such as policies. Furthermore policies created at the macro level can transfer back through the meso and micro levels to promote changes in action. Finally information at the micro level may be translated to the macro level when individuals present issues to the government (Kuziemyky & O'Sullivan, under review).

One shortcoming we recognize with the ED Model of Awareness is that it identifies the structure of the different levels of awareness, but it does not demonstrate how awareness activates action. For example the preliminary model does not indicate what motivates people to pursue more awareness, or what drives them to act upon this acquired awareness. Furthermore the preliminary model stops short of explaining how individuals are motivated to collaborate and bring personal awareness to groups. To expand upon this, we selected Self-Determination Theory (Deci & Ryan, 2008) as a complimentary theoretical perspective to explore how awareness activates action through the identification of motivational elements.

## **CHAPTER 4: Results**

This chapter presents eight themes that emerged from the data and address the research questions posed in this study. Each theme is supported by quotations from the interview transcripts. This is followed by a presentation and explanation of the revised ED Model of Awareness and Action, developed from this analysis.

As stated previously, the overarching research question for this study was: How does awareness activate an individual toward collaboration in a disaster management asset-mapping task and sustain action? The three specific research questions are the following:

1. What are the drivers of motivation stemming from awareness that initially bring people together to collaborate in an asset-mapping task?
2. How does awareness generated through the asset-mapping task activate individuals to continue to collaborate in activities at the meso level?
3. How does the interaction between awareness and motivation to collaborate influence community resilience at the macro level?

### ***4.1 Emergent Themes***

The emergent themes are presented under subheadings to represent their relation to each of the levels of awareness. Participant motivation throughout the intervention evolved over time, as people were motivated differently before and during collaboration. The emergent themes are listed below:

#### **4.2 Themes identifying early motivation driving the individual toward collaborative action**

1. Awareness influenced the underlying psychological needs of competence and relatedness to encourage autonomous motivation for collaboration
2. Awareness of group assets and needs is necessary to ensure collaborative activities are accessible to all participants

#### **4.3 Themes identifying motivation toward maintaining meso level collaboration**

3. Awareness initially disrupts disaster competence then reinforces it longitudinally
4. Perceptions of competence influenced collaborative engagement
5. Group awareness contributes to relatedness, which is a foundational element for collaboration
6. Leadership emerged as a key ingredient in fostering awareness

#### **4.4 Themes identifying motivation influencing awareness translation to the macro level**

7. Awareness prompted participants to share information with others
8. New awareness improved community resilience

Subheading **4.2** discusses themes related to participants' initial motivation starting at the micro level, prior to and early on in their participation, as well as what prompted them to participate in meso level collaboration. Section **4.3** demonstrates the motivators present during meso level collaboration, and section **4.4** discusses motivators driving the transition of meso level awareness to the macro level.

Some of the types of awareness discussed in section **2.2** were used when describing the nature of the themes. These include: situational awareness (the awareness

of the factors surrounding an event that is used to make decisions and plan courses of action), activity awareness (the awareness of the nature of a collaborative activity and how to accomplish goals), group awareness (the awareness of member positions, roles, and skills throughout collaboration), and awareness of the outcomes of the EnRiCH asset-mapping activity and collaborative efforts. Micro level awareness (awareness held by an individual), was also included in the results.

Recurrent throughout the themes are discussions on how the fulfillment or lack of fulfillment of the psychological needs of relatedness and competence influenced participant satisfaction, motivation, and functioning within the collaborative task. Different factors influenced these needs throughout and will be expanded upon in the results below. As a general overview, a feeling of relatedness was mainly affected by increased group awareness and group cohesion (Themes 1, 5, and 6). Participant competence was influenced by multiple factors including: having an active voice (Theme 1); disruptions in disaster competence influenced by situational awareness (Theme 3); and perceptions of individual skill, group outcomes, and personal value (Theme 4).

#### ***4.2 Themes identifying early motivation driving the individual toward collaborative action***

The first two themes explain how motivation prior to and during the intervention influenced initial participation in the collaborative asset-mapping task (research question 1). Theme 1 states that participants were motivated differently (autonomously or controlled) and provides insight into how this motivation changed once participants become engaged in the task. Theme 2 presents some prerequisites for collaboration in meso level activities.

*1 - Awareness influenced the underlying psychological needs of competence and relatedness to encourage autonomous motivation for collaboration*

There were commonalities in what participants sought from the collaborative task. These included seeking awareness to increase disaster preparedness, understanding of community organizations, connectedness, community integration, and to share knowledge with others. Individuals seeking this awareness described autonomous, controlled, or a combination of both types of motivation. A key finding was that activity and group awareness influenced underlying psychological needs of competence and relatedness and contributed toward autonomous motivation to collaborate. For example, several participants were initially drawn to the task because of the enjoyment they experienced from feeling useful and meeting new people. When asked what she hoped to gain from the intervention one participant responded,

*“Being selfish is the first one I’ll say ... it’s making me feel more useful ... Sometimes people with disabilities don’t feel as useful as people that aren’t disabled - you’re not asked to do things as much as an able-bodied person ... I mean, I used to point out, I’m disabled, I’m not dead, you know I’m not dead. And the thing is that also, too, I’m getting to know more people in my group. I’m taking more of a notice of what needs to be changed, and accessibilized in Truro.” (P16 Int2)*

Underlying this autonomous motivation was the fulfillment of two psychological needs from self-determination theory: competence and relatedness. This participant felt connected to the task because she had an active voice, which created a feeling of competence. This participant became more engaged as she gained more activity awareness, which led to further feelings of competence and additional opportunities to voice opinions and concerns. This participant also experienced relatedness as she met

new people and as group awareness was enhanced. This combination of feeling valued and having a sense of belonging increased both competence and relatedness for many participants, which positively influenced their overall enjoyment and engagement in the collaborative group. Activity and group awareness also influenced these psychological needs for other individuals who expressed a desire to contribute to improving their community, a sense of responsibility, and pride from participating in a task that was making a difference.

Some participants participated for obligatory reasons, such as representing their organization. However, a common occurrence was for participants to experience a combination of autonomous and controlled motivation.

*"I don't know again if that's because I'm coming to the group flying the [Organization] flag or I'm coming to the group flying [my] flag. It may be a combination of both, I enjoy people, I enjoy building relationships but I'm also [representing my] organization." (P22 Int 5)*

For some participants, the combined drivers seemed to change over time. Often participants attended the intervention for controlled reasons, but became more autonomously involved as the task progressed because they began to see its value. Others, especially those who assumed more responsibility among the group, described feeling burdened by the expectations of the other participants. This was due to variations in participant skill sets and the group trying to achieve synergy throughout the task. Participation among these individuals was made more enjoyable through the fulfillment of the psychological needs. One participant provided more insight into the influence of awareness on promoting task engagement,

*"I believe it's up to the group...It's about energy...I think most of us are not energized in the areas that we need to be within our communities because we're not aware. I've found in anything that I try to do in the community,*

*awareness is always the biggest issue. Like if you can make your group perfectly aware of any issue, there'll be a percentage of that group that will be interested in that issue." (P5 Int 2)*

This quotation demonstrates that awareness has the ability to energize participants toward action. This theme underscores how awareness motivates collaboration by providing individuals with a voice and by enhancing their sense of belonging. Despite there being different types of motivators influencing engagement, awareness can influence the underlying psychological needs, promoting task enjoyment, thus making the action more autonomous. Finally, using awareness to foster these underlying needs can increase task satisfaction for individuals influenced by controlled motivation. This theme is important to research question 1 because it acknowledges the motivators present prior to the collaborative task that prompted meso level involvement. It also relates to research question 2 because it indicates that supporting competence and relatedness through awareness helps to further encourage and maintain collaboration.

***2 - Awareness of group assets and needs is necessary to ensure collaborative activities are accessible to all participants***

The majority of participants were engaged and able to participate, although some did experience issues due to personal limitations that need to be noted. For example, one participant had difficulty using Google Docs because of limitations lingering from a past stroke,

*"It's very little physical difficulty. It's more of a mental difficulty. That's a result of the stroke I had., I have a real difficulty multi-tasking...I have a real problem staying focused for any length of time. But on the physical end of things, if I have to update information or include any sort of text or anything*

*where I have to type in information it takes me forever. I've always done one-finger typing actually was fairly good at it but I now have difficulties that I, and again I think the stroke and now I reverse letters. I'll go and get through something and I'll find out, ok I need spacing here, I've got to reverse the letters in this and, of course, the more frustrated I get, the worse it gets, so." (P25 Int 2)*

Some group members experienced challenges with computers because arthritis in their fingers made it difficult to type, while others had limited vision, which was accommodated by setting the computers to use larger font. Another participant who was hard of hearing wanted to be actively engaged in the intervention but had to leave halfway through the first session because of difficulty hearing, thereby missing important information. These examples demonstrate the importance of group awareness of participant needs to ensure that everyone can access the information and be engaged. This theme relates to research question 1 and 2 because accessibility is important for collaboration particularly in terms of engaging and sustaining participation.

#### ***4.3 Themes identifying motivation toward maintaining meso level collaboration***

The next four themes discuss the motivation present at the meso level that maintained collaboration (research question 2). Theme 3 describes how initially situational awareness may disrupt disaster perceptions but then build competence over time and help sustain participation. Theme 4 highlights how perceptions of computer competence, group outcomes, and personal value, influence engagement. Theme 5 notes the influence of group awareness on relatedness and motivation at the meso level. Finally, theme 6 discusses the importance of leadership in maintaining group awareness and structure during collaboration.

***3 - Awareness initially disrupts disaster competence then reinforces it longitudinally***

Participants were from multiple backgrounds and ranged in the extent of their disaster experience. The majority noted an initial change in their understanding of disasters after the first focus group. Originally some stated they were competent with disasters as they felt that they knew the information required to manage their responsibilities during preparedness and response; however after reflecting upon their own experience during the EnRiCH sessions, many participants noted gaps in their situational awareness and realized they were not as prepared as they had thought.

*“Your group was able to bring more awareness to us of how easy and more that we needed the connectedness or more of it... we assumed that we were connected, at a level 5, but by speaking with your group we all realized that we were connected in helping people but not fully if a disaster would happen, none of us has shared what our plans would be so it really made it more so we were actually only a 2, and now we've realized that we gotta step up to the plate and be a 5.” (P30 Int 2)*

This quotation demonstrates that enhanced situational awareness influenced participants to reconsider their own context and understand that there may be gaps in their preparedness. The participants described that new situational awareness lowered their perceptions of competence with disasters and motivated them to seek more opportunities to collaborate, to become better prepared. However, though situational awareness may initially negatively affect competence, over time it also increases it.

As people gained more situational awareness and became more proficient with disaster preparedness they felt their competence increase and were more self-determined and motivated in the task. Knowledge translation occurred in each meeting as members shared information and insights within the group. After the first focus group, participants noted that their situational awareness had grown and they were taking action to think

more critically about disasters. By the last interview, many participants felt competent with disasters because of the awareness they had gained. Below are two quotations where the participants were asked if they experienced any change in feelings of competence over the time of the study.

*“We've got the resources now and we've got the physical resources and now we've got the knowledge resources to come to bear on any response, we're making contact with people we wouldn't have thought of before. To help us or to become part of our resource list to be able to respond to a disaster. So we've learned about other organizations, other organizations have learned about us and now we can figure out who does what best in a disaster response so we can effectively use each other's resources in time.”(P14 Int 4)*

*“I think through these meetings (EnRiCH and others), pretty confident...I think I'm well aware of who I need to contact and how exactly to get in touch with them.”(P8 Int 4)*

These participants, like many others, expressed how situational awareness evolved over time. With each meeting the participants incorporated new information into their understanding. This increase in situational awareness also increased their sense of competence with disaster response and served as a motivator for continued collaboration. Furthermore as participants began to see the value in the awareness that they were gaining, their motivation to maintain collaboration became more autonomous. Many participants also used their new situational awareness to take personal action and increase disaster competence through the preparation of 72-hour disaster kits, demonstrating the effect of knowledge translation from the meso level to micro level.

Thus in this theme awareness is acting as a disruptor of perceptions, which facilitates the search for more awareness and is further enhanced through collaboration. Disruptions can motivate continued awareness seeking, while improvements in awareness may make participants feel more competent, which may or may not sustain the search for further awareness. It is important to note that this type of motivation is controlled as

participants are trying to gain awareness to fill a gap in competence out of need, and not necessarily out of personal enjoyment. Some individuals whose competence remained the same did not take any further action, used their knowledge to aid others, or continued to be open to maintain awareness through collaboration. Many participants noted that even though they gained situational awareness, one can never be fully prepared, and thus they were continuously motivated to improve awareness.

This theme pertains to research questions 1 and 2. In terms of research question 1, people in the community who gain awareness of the need for disaster preparedness and collaborative action may realize that they themselves are not competent in that area. This could result in them becoming motivated to improve competence by attending or organizing collaborative events. For research question 2, participants may be aware of the benefit of collaborative activities, and thus sustain action. Furthermore, they may continue participating to remain up-to-date on disaster preparedness and improve/maintain competence. This theme demonstrates that awareness initially disrupts the underlying psychological need of competence, which then motivates collaborative action. This need is then supported longitudinally which serves to sustain motivation.

#### ***4 – Perceptions of competence influenced collaborative engagement***

Theme 1 demonstrates that people were autonomously motivated to initiate participation when the psychological needs of competence and relatedness were fulfilled. In comparison, this theme demonstrates that there may be a decline in engagement when participants feel that competence is absent.

Some participants who perceived themselves as competent with computers appreciated the ability to access Google Docs on their own time in their preferred

environment. However, other participants experienced challenges in using Google Docs for various reasons, including lack of skill, lack of access to a computer, physical limitations, and perceived inability to use computers. When participants experienced difficulty they felt that they lacked computer competence and described feeling less motivated; some of these participants began questioning their competence for completing the entire intervention.

*“When it comes to going on my computer and doing anything, I’m just a complete bumbling mess [laughs]...I just can’t seem to-I suppose I’m really not-I’m too old to-not bother-interested in it. And that’s all. And I mean, I don’t know enough about the computer to get into.. I don’t have the patience-if I do something wrong, I get frustrated and I don’t have the patience-I just want to shut it off and go away for a little...I managed to figure out how to-how to get onto (on the site)- whether I can do it again or not, I don’t know, but I don’t have patience to stay on, put anything on it, or something like this. So I don’t have interest I guess.”(P24 Int 4)*

Many participants also described feelings of lowered competence and motivation because they were uncertain about the sustainability of the group. One participant discussed the challenges experienced due to low awareness,

*“Yes. The size of the group, not really understanding what they were getting into, outside as well, could be a barrier to some people, and just being unsure of what their – what their role is – why they’re there, what they’re doing, what folks are hoping to learn cause of course this has been presented at first as a research project. Like, someone might think, “well, what do I have to contribute to a research project?” So, those kinds of things could – could be difficult.”(P3 Int 4)*

Another participant expressed uncertainty about their personal value to the group. This participant did not feel that they would be part of the sustained group interaction and dropped in their engagement as a result,

*“I’m sure, in the beginning, everybody was there for a valid reason, but as it went on, I kinda wondered, like, alright, what are these people – like, once you have their input, then why are they there? Like, what are they gonna do carrying on? Like, to me, it should be – and maybe it is now, like petered down to a core group that has taken all that information and applied it in*

*some way into a template or something. Yeah. And I didn't even see myself as one of those core people. I can provide – like, I could go to those meetings and say, this is what [my organization] can provide in case of an emergency and then somebody needs to take that and put it into a template somewhere, um, you know, that it could be utilized if there is an emergency...and I'm not one to just go sit in a room just to be there?... And I kinda, you know, felt like I'd outlived my usefulness as far as input goes.”(P10 Int 4)*

This quotation demonstrates that awareness of outcomes is critical to maintaining perceived competence regarding personal contributions to the group, and motivation throughout the collaborative process. This participant did not understand their value to this initiative. They felt as though they were not a key contributor, which negatively influenced perceptions of competence and decreased engagement. Thus participants should be clear about project goals and their own value to the task in order to maintain engagement.

This theme demonstrates that engagement may decline if participants do not perceive themselves as being competent within the task. This theme relates to both research questions 1 and 2, in the sense that it is important that the entire group is educated and supported in using collaborative tools to be able to initiate and sustain their participation. Activity awareness should be facilitated to aid participants in using the collaborative tools early on. This theme also relates to research question 2 as awareness of outcomes can serve as a mediator of collaborative engagement by maintaining feelings of competence about task success and goals.

***5 - Group awareness contributes to relatedness, which is a foundational element for collaboration***

Throughout the intervention multiple participants noted a need for better relatedness amongst the people participating in the task. The first focus group was intended to orient each member, however several participants felt the introductions were too brief and they required more group awareness and an improvement in their communities of practice before being able to fully integrate into the collaborative activity.

*“My personal sense of belonging at this point is probably a 2...I think based on the fact that I ended up at a table with people that I didn’t know, and people who I had nothing in common with, who weren’t there for the same reasons that I was there. Didn’t have the same background or knowledge of the topics.”(P4 Int 3)*

This participant, like others, was interested in the task but sought to have better relatedness to understand group roles. This was especially true for participants who did not have community awareness prior to the intervention.

*“But for somebody new, who doesn’t know very many people, then – and hasn’t lived here for generations, I would’ve appreciated having a list of all the participants and their names ahead of time so that – and even if I didn’t have a telephone number or an email for their organization or whatever, then at least I would know them, and when they stood up the next time, I would be able to feel confident. Oh yes, I remember them from last time, and I know which group they belong to. And it just makes it in my mind, I like to know, and then there’s no way you can talk to everybody, but it would’ve made that link.” (P15 Int 4)*

Both above quotations note the importance of relatedness to collaboration. Furthermore they demonstrate that group awareness is critical to influencing relatedness, which in turn contributes to task motivation and engagement by providing a sense of belonging and comfort within group interactions.

This theme further demonstrates that group awareness is essential to maintaining the psychological need for relatedness and as noted in theme 1, autonomous motivation throughout collaborative activities. This theme pertains to research question 2, as it is important to foster group awareness for participants to feel a sense of belonging during collaboration to autonomously motivate active engagement.

### ***6 - Leadership emerged as a key ingredient in fostering awareness***

A key factor for the group participating in this intervention was the emergence of leader figures. As discussed in the previous theme, some participants experienced a lack of relatedness and contact outside of the focus groups, and were not satisfied with task engagement. After the first focus group, these participants quickly noted that leadership was needed to provide structure and maintain contact:

*“my view of the process is that it’s a group without a leader, like there is no core, there’s no board, there’s no leader, there’s, you know, it’s a group of really good likeminded people but that’s all it is.... it would have to have a board or, community partners meeting or something like that where you meet regularly, and the onus is on people to, update their profiles on there and stuff like that.” (P10 Int 2)*

To fulfill this need, leaders emerged over time to arrange additional meetings, facilitate group communication, actively recruit new members, and aid with using the collaborative tool. One participant emerged as a leader after the first focus group, fulfilling a vital role in fostering group relatedness through additional meetings and by maintaining contact through email and phone calls. The quotation below represents a common experience of the participants after attending additional meetings,

*“[She] brought us all together so we could meet and talk to each other. We’re gonna meet one more time so we’re familiar with each group and each person, so that we’re comfortable around, to feel like a group, like we belong to one another.” (P11 Int 4)*

This quotation was recorded in the interview following the second focus group. It demonstrates that these additional opportunities to interact were critical to improving relatedness among the participants and to creating structure among the group. It also identifies that the additional meetings provided a level of comfort and openness among the group, which as discussed in theme 1, is important for being able to freely share information and for being autonomously motivated in a task.

The presence of leadership served to inspire others, which autonomously motivated them to participate and take their own initiative within the group. This theme relates to research question 2, as it was apparent that leadership was critical in maintaining task motivation and fostering group awareness to promote further collaboration.

#### ***4.4 Themes identifying motivation influencing awareness translation to the macro level***

The final two themes present the transfer of awareness from the meso level activity to the macro level (research question 3). Theme 7 demonstrates participant motivation to share information with other community members outside of the EnRiCH collaborative group. Furthermore theme 8 presents the perceived influence of the awareness generated during the task on overall community resilience and motivation to continue collaboration in future events.

*7 - Awareness prompted participants to share information with others*

Some organizations requested that the participants bring information back after the sessions (controlled motivation), but many participants were autonomously motivated to share their new awareness with their organizations and their community, regardless of whether they were asked to specifically. Some people integrated EnRiCH ideals into their own mandate and presentations, while others shared information with their families and neighbours.

*“We've really connected since we'd had these meetings through you people. I've had I don't know how many of the club and they've been running us all through their programs and whatnot. Yeah, we're really starting to get into it now. I've got a few more lined up as well. I've got a lot of contacts from there. And our club had no idea about what your program was or anything but the ones that have attended your meetings have all brought it back and then they've been asking a lot of questions, our club has. So we've been bringing the people who've attended the enrich program into our club and everyone that comes in, it doesn't matter what they talk about they also include EnRiCH.” (P13 Int 4)*

*“we don't talk about disaster management without talking about EnRiCH. So it's become part of our jargon and when we promote our program to anybody we talk about the collaboration and the EnRiCH project.” (P14 Int 4)*

These two quotations demonstrate that by the end of the intervention participants acknowledged the value of the process and felt more connected. Their participation autonomously motivated them to actively develop new contacts and share information with their own organizations. Furthermore, they took action to actively promote preparedness in the community and integrate it into their own educational presentations. Some of these participants were also recruited by other organizations because of their engagement in the task, demonstrating that awareness in collaborative activities can prompt spinoff projects. For example, one

participant who became a champion for training others on computers during the intervention was asked to teach others in the community,

*“They approached me at the focus group. They want to set up a, they want to set up a computer lab... They want to set up a computer lab to teach some computers...Anyway, he wants me to consult with, get with the computers and then there’s a possibility I might be a help to train them.” (P16 Int 2)*

This theme demonstrates that as participants gained awareness, they began to see the value in a task, which autonomously motivated them to transfer knowledge. It pertains to research question 1 in the sense that when participants shared information, they prompted others to engage and show interest in participating in the collaborative task. It relates to the research question 2 because gained awareness facilitated other collaborative tasks. Furthermore, as members shared their knowledge with their organizations, they were encouraged to maintain participation. Finally this theme relates to the research question 3 in that the sharing of information amongst various groups and community members serves to increase connectedness and community resilience.

### ***8 - New awareness improved community resilience***

Overall participants felt that resilience changed because information was brought back to the community and their organizations, as discussed in the previous theme. Participants became more aware of the importance of collaboration, of diverse needs, who to contact, and their role in a disaster response. They indicated that increased relatedness between organizations would make a difference to resilience in the long term,

*“It already has in the sense that the groups are face to face more now and A is finding out that B can fill this need for them and vice versa. So yes, I’m sure that that does reflect the resilience.”(P5 Int 4)*

There is evidence that the contacts made during EnRiCH contributed to improved response in the floods experienced after the intervention was complete. One participant who is a first responder reflected on the response during the flooding,

*“[It was] faster. The need was identified instead of having to go out and research the answer or research the partner to fulfill that need, we already knew who they were because of the EnRiCH project. Yeah, so it's increased our ability to respond sooner to meet the needs.”(P22 Int 5)*

Furthermore, participants noted that the asset-mapping tool is a useful strategy to support resilience,

*“I've been on the documents there a few times in Truro and just reading through the services that are available and certainly just kinda eye opening that those things are in your backyard and you can utilize them. So certainly the opportunity for resiliency is there because you got somewhere to look and all that stuff.”(P7 Int 2)*

The opportunity to have access to such information from the community that could be constantly updated and maintained has provided the organizations with a resource to consult. It also influenced motivation to maintain collaborative activities and gained awareness. Finally, the individual action taken by participants to create 72-hour kits as previously mentioned, also contributed to increase resilience.

Though it is difficult to measure the impact of the collaborative task on the community, it clearly has had an effect in improving overall response efficiency and awareness of who to call upon and where to access needed resources. This theme relates to the research question 3 in the sense that improvements in awareness have been motivators to improving disaster resilience.

#### 4.5 Different types of competence

The notion of competence is described throughout the themes. It is worth noting that different types of competence became evident during analysis, they are presented in the table below:

Type of competence	Definition
Disaster competence	Proficiency with the elements of disaster preparedness, response, recovery, and mitigation.
Collaboration competence	Ability to actively participate in group interaction. Includes being able to voice opinions and provide input.
Technological competence	Proficiency when using technology, such as computers.
Perceived individual competence	An individual's belief in their ability to be competent within a task; includes perceptions involving the above three types of competence.
Perceived group competence	An individual's belief in a group's ability to succeed and accomplish goals.

#### 4.6 Research questions and emergent themes

Below is a table that presents the research questions and their relation to the themes. It is important to note that the themes are listed alongside the research questions that they apply to most, though there is overlap throughout.

Research question	Themes
What are the drivers of motivation stemming from awareness that initially bring people together to collaborate in an asset-mapping task?	1. Awareness influenced the underlying psychological needs of competence and relatedness to encourage autonomous motivation for collaboration
	2. Awareness of group assets and needs is necessary to ensure collaborative activities are accessible to all participants

How does awareness generated through the asset-mapping task activate individuals to continue to collaborate in activities at the meso level?	3. Awareness initially disrupts disaster competence then reinforces it longitudinally
	4. Perceptions of competence influenced collaborative engagement
	5. Group awareness contributes to relatedness, which is a foundational element for collaboration
	6. Leadership emerged as a key ingredient in fostering awareness
How does the interaction between awareness and motivation to collaborate influence community resilience at the macro level?	7. Awareness prompted participants to share information with others
	8. New awareness improved community resilience

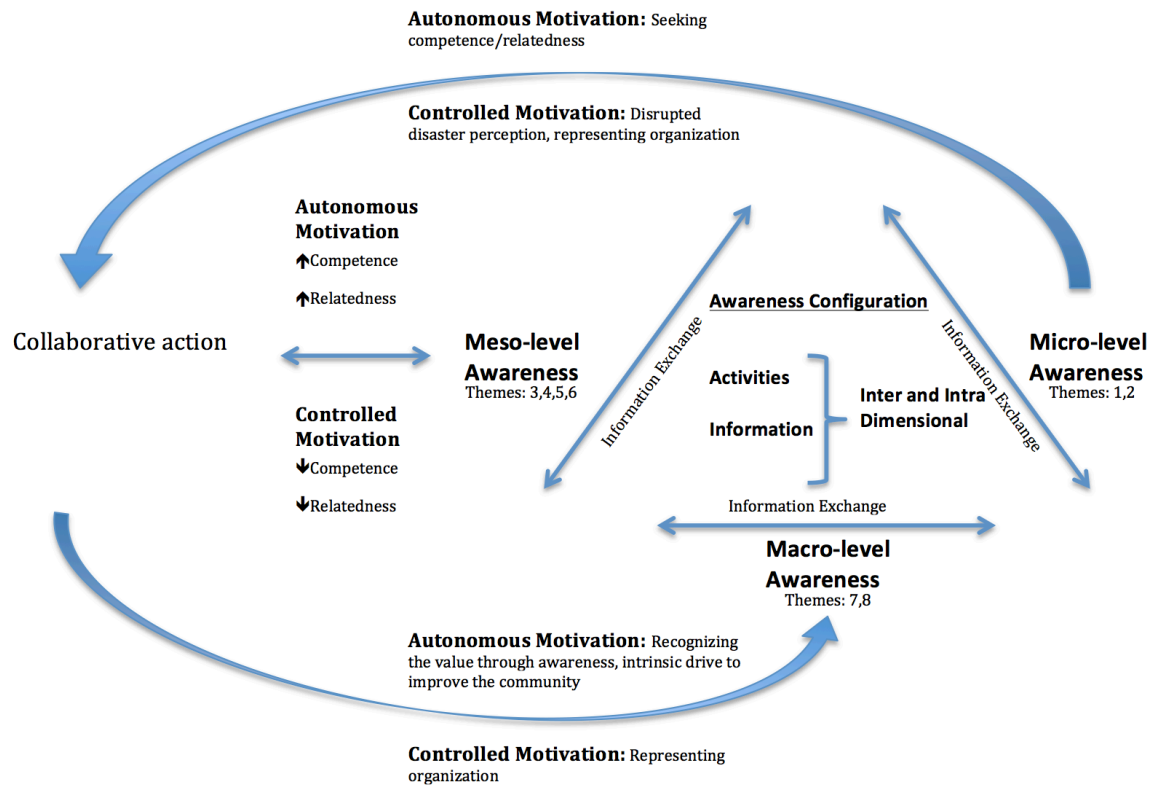
**4.7 Collaboration Facilitators and Barriers**

It is important to understand that collaboration is also affected by factors outside of awareness that may facilitate or prevent participation no matter how motivated the participant. Money and time were two main factors most discussed by participants as influencing engagement. When participants and their organization were financially stable, and they had time set aside to attend EnRiCH, their participation was better facilitated. However many participants were motivated to attend but had difficulty because they were not financially supported, unable to take time off of their job, and they had other commitments that took priority.

**4.8 The ED Model of Awareness and Action**

The themes described above provide insight into the influence of awareness on the psychological needs of competence and relatedness. These needs must be satisfied for participants to feel self-determined and more motivated to collaborate. These findings

were used to expand the ED Model of Awareness to depict this interaction. The revised model is called The ED Model of Awareness and Action, and is presented below:



**Figure 4: The ED Model of Awareness and Action**

\*Themes are listed under the level of awareness that they relate to the most to depict how they integrate within the model.

The ED Model of Awareness and Action was created using elements from the emergent themes, Self-Determination Theory, and the original ED Model of Awareness. The original elements of the ED Model of Awareness are retained in this new model; Awareness continues to transition between each level of society, the small arrows that make up the triangle designate this. The previously described intra and inter dimensional activities serve to create awareness at each level and prompt knowledge translation between levels. Three additional arrows were added to demonstrate the motivational elements driving awareness transition in the original model. These arrows are annotated to indicate drivers of motivation stemming from awareness at each level that prompt

collaborative action and information exchange. It is important to restate that individuals who are participating because of autonomous motivation are more likely to be satisfied than those motivated by controlled motivation. The following sections demonstrate why an individual may participate in collaborative activities. It will also provide insight into motivators behind awareness transition to the macro level.

***From individual micro-level awareness to collaborative action and meso-level awareness***

An individual has a baseline level of awareness and will participate in collaborative activities to gain further awareness from the meso-level or to share their own awareness with others. This knowledge translation can result from autonomous, controlled, or a combination of both types of motivation. Autonomous motivation results from the drive to increase the intrinsic needs of competence and relatedness. An individual will seek out meso-level awareness through intra dimensional activities at the meso level in order to support these needs. An individual may also be motivated by controlled motivation and will remain in collaborative activities so long as this motivation is present. It is possible that an individual prompted by controlled motivation may also be participating autonomously or become autonomously motivated through the fulfillment of the needs. If this is the case, motivation is more likely to be sustained when controlled motivators are no longer present.

***Maintenance of collaboration through awareness gained at the meso-level***

An individual participating in intra dimensional activities at the meso-level will maintain engagement to improve/sustain meso-level awareness. During collaboration, participants may continue to be autonomously motivated by relatedness gained from

group interaction. If an individual who hoped to improve relatedness is unable to fulfill this need over time, task satisfaction and motivation to participate may decrease.

Individuals may also be motivated by autonomous motivation to become more competent in a skill or about an issue that is improved by the group activity. Thus when awareness at the meso-level is enhanced and competence is fulfilled, participation is sustained. When a participant does not feel valued, competent enough to participate in an activity, or their need for competence is not fulfilled, their motivation may decline.

Awareness gained at the meso-level may also disrupt perceived competence. When this happens, people may be motivated by a need to gain more awareness to fill knowledge gaps. In these cases their participation is sustained by controlled motivation. Awareness can strengthen competence over time and maintain/improve engagement as the need is fulfilled. An individual may sustain participation to preserve competence and prevent further knowledge gaps. They may also become more autonomously motivated if they understand the value in the meso-level awareness and enjoy improving it.

### ***Knowledge translation from meso level awareness to macro-level awareness***

As new awareness is gained at the meso-level, an individual or group may chose to share knowledge with the overall community. People may be motivated by autonomous motivation if they believe that this knowledge will impact the population; they may also have an intrinsic drive to support the community. Furthermore they may be motivated by controlled motivation to transfer knowledge as an organizational requirement.

## **CHAPTER 5: Discussion**

As previously discussed, awareness is important to supporting collaboration in disaster management activities. However, the literature indicates a need to understand the connection between awareness and collaborative action (Cave et al., 2009; Kuziemyky & Varpio 2011; Mendoza et al., 2014; O'Sullivan et al., 2012a; Scolobig, De Marchi, & Borga, 2012; Pelletier & Sharp, 2008) with a focus on mobilizing initiatives that integrate high-risk populations (Enarson, & Walsh, 2007). This thesis provides partial answers to this interaction by identifying drivers of motivation stemming from awareness.

The key finding of this investigation is the identification of the importance of awareness on the psychological needs of competence and relatedness, and how this contributes to motivate collaborative action. These results indicate that when creating collaborative groups or opportunities for citizens to engage in asset-mapping tasks it is imperative to find ways to ensure that innate needs are met, so people will be motivated to engage and put effort, which will contribute to awareness and further the cycle of awareness to action. It was found that when these needs were fulfilled, participants felt more satisfied within the task and then were more motivated to become engaged. One study observing participation in an online community found that members had feelings of wellbeing and were more prone to make connections when the psychological needs were satisfied (Tsai, & Pai, 2014). Another study investigating student group work observed increases in task interest following need satisfaction (Minnaert, Boekaerts, & Barbander, 2007). It is important to note that though the search for relatedness and competence was analyzed as being sought prior to collaboration in this thesis, this relationship is not

definite. It may be possible for an individual to participate in a collaborative activity first and then experience need fulfillment, which may then contribute to motivation.

The following paragraphs discuss awareness and motivation to collaborate in relation to research questions one and two:

1. What are the drivers of motivation stemming from awareness that initially bring people together to collaborate in an asset-mapping task?
2. How does awareness generated through the asset-mapping task activate individuals to continue to collaborate in activities at the meso level?

In relation to research question one, the results from this thesis suggest the search for relatedness was important in initiating motivation to collaborate. Furthermore, maintenance of relatedness was critical to sustaining motivation throughout the task (research question two). The literature supports these findings. The search for relatedness was a motivator in those seeking online collaboration in one study, as participants wanted to feel that they were part of the group (Tsai, & Pai, 2014). A sense of initial relatedness during group projects contributed largely to task interest in another study (Minnaert, Boekaerts, & Barbander, 2007). Furthermore, a study investigating the motivation of citizens to participate in health promotion activities noted that being part of a social partnership was important to sustaining motivation (Fienieg et al., 2012). This thesis found that when participants felt relatedness, they expressed feelings of task satisfaction and were more autonomously engaged. When participants lacked relatedness they expressed a need for more and in some cases worked to improve it; in others, a drop in motivation was noted.

In terms of both research questions, this thesis acknowledges the importance of the different types of awareness in influencing relatedness. Participants better understood other members and felt a sense of belonging when group awareness was facilitated throughout collaboration. Similarly, promoting group awareness during web-based activities improved communication, collaboration and provided members with a sense of belonging in one study (Wang, Zheng, & Chang, 2012). Jongsawat and Premchaiswadi (2014) infer that awareness (situational, activity, and group) has positive effects on cohesiveness, work quality, and decision-making during web-based collaboration. Additionally, the most successful teams completing homework assignments used online chat to facilitate team awareness and coordination (Carroll, Jiang, & Borge, 2014). Finally, activity awareness positively influenced participation when participants could view the actions of other members on online health social networks (Kimani et al., 2010). Findings from this thesis suggest that relatedness can be improved by ensuring that participants feel welcomed, have a sense of belonging, and are made aware of other members. It is also important to do introductions early and foster group awareness from onset.

The search for competence was also important in initiating motivation to collaborate (research question 1). In some cases participants joined the task to become more competent. In others, disrupted competence influenced them to seek more information from group interactions. Maintaining competence throughout the intervention was important in participant engagement (research question 2). Minnaert, Boekaerts, & Barbander (2007) acknowledge the importance of competence to initiation and maintenance of engagement in group work. Other studies note that participants

joined in tasks to develop their skills and gain competence through knowledge attainment (Fienieg et al., 2012; van der Velde, Williamson, & Ogilvie, 2009). As participants in this thesis gained competence, they became more involved. Similarly, Guthrie and Klauda (2014) note deeper engagement when students experienced competence during their tasks.

The results from this thesis acknowledge that participants must feel valued and as though they are contributing, otherwise their motivation may decline. This is important for sustaining collaborative action (research question 2). The literature supports this concept, suggesting that people must feel as though they are providing value in order to participate (Guthrie & Klauda, 2014; Minnaert, Boekaerts, & Barbander, 2007; Tsai, & Pai, 2014). Furthermore, having a sense of empowerment by being able to express opinions was an important motivator maintaining engagement of immigrant and refugee populations in a participatory action research intervention (van der Velde, Williamson, & Ogilvie, 2009). This thesis identifies that participant competence and sense of value can be influenced by ensuring that voices are heard during meetings and by acknowledging the impact of individual contributions.

This thesis identifies that participants needed to feel competent when using the collaborative tool. Furthermore, participants must also perceive competence in group success. Both of these concepts were important to long-term motivation (research question 2). The literature supports that people must identify themselves as competent when using group tools such as online websites to be motivated (Tsai, & Pai, 2014). One source also acknowledges that the perceived competence of students was an important factor motivating their engagement (Guthrie & Klauda, 2014). Furthermore there is a

higher likelihood of trying to achieve a goal if a person understands it and perceives themselves as competent enough to attain it (Ryan and Deci, 2000). This thesis also identifies the importance of addressing the needs of high-risk individuals to ensure that their personal limitations do not prevent access to using collaborative tools or engaging in asset-mapping. Thus activity awareness should be emphasized to ensure they are competent and supported when using collaborative tools. Furthermore, participants need to understand group outcomes and view the group as being able to succeed.

When participants realized the importance of the task, they were more likely to participate and remain engaged (research questions 1 and 2). Task emphasis was confirmed as a support for motivational engagement by other sources (Guthrie & Klauda, 2014; van der Velde, Williamson, & Ogilvie, 2009). Van Schie et al. (2014) notes that it is critical participants not only value a task, but also that task goals are congruent with participant values. Dwyer et al., supports this congruence by identifying that engagement and satisfaction are improved when people who volunteer acquire knowledge that fills their needs (Dwyer et al., 2013). This thesis notes that the facilitation of situational awareness can emphasize task importance and identify knowledge gaps, which can both initiate and maintain engagement.

This thesis demonstrated the importance of leadership figures in facilitating structure and group awareness. This leadership was significant to both initiating and sustaining collaborative motivation throughout the task (research questions 1 and 2). One study exploring disaster preparedness and mitigation noted that a central figure or group was important in the communities for providing a point of contact between organizations, in gathering external resources, for giving the groups direction and structure, and for

prompting/maintaining action (Stidham et al., 2014). The leaders observed in this study were autonomously supportive. Other methods in which an authoritative figure uses more controlling strategies were not explored, though they may be valid options. However in cases like these, autonomous motivation is undermined and if participants do not feel as though their psychological needs are being met, their satisfaction and effectiveness within the activities may decline. Van Schie et al. (2014) supports that the quality of motivation among volunteers with autonomous leadership is preferred because when volunteers feel obligated to do a task, their motivation drops.

Overall, in relation to research question three (How does the interaction between awareness and motivation to collaborate influence community resilience at the macro level?), the EnRICH intervention served to promote the sharing of awareness with the community and has shown evidence of improved disaster preparedness and response. A summary of the new knowledge gained from this thesis is provided below:

**Table 3. Addressed Literature Gaps**

What we knew	What we didn't know	Research questions to address gaps	New knowledge
Awareness is a multifaceted concept essential to supporting collaborative activities	How awareness initially motivates an individual (micro level) to participate in collaborative activities	What are the drivers of motivation stemming from awareness that initially bring people together to collaborate in an asset-mapping task?	Participants were motivated to collaborate to feel relatedness within a group; this is facilitated by group awareness.
			Situational awareness disrupts disaster competence, which motivates the search for further awareness through collaborative action.
	How awareness generated in meso level activities initiates and sustains activation	How does awareness generated through the asset-mapping task activate individuals to continue to collaborate	Situational awareness must remain current to help participants improve disaster competence and encourage engagement over time.

		in activities at the meso level?	<p>Activity awareness must be facilitated to ensure participants feel competent in using asset-mapping tools.</p> <p>Providing awareness of outcomes fosters perceptions of competence in task success and helps participants identify their personal value in the task.</p> <p>Relatedness must be maintained to sustain motivation; this is facilitated by group awareness.</p> <p>The promotion of further collaborative activities occurs when participants value the task, which motivates knowledge translation to others.</p>
Awareness and collaboration are essential to community resilience	How the interaction between awareness and collaborative action influences macro level resilience	How does the interaction between awareness and motivation to collaborate influence community resilience at the macro level?	<p>Awareness gained in the collaborative activity contributed to faster response during flooding.</p> <p>Awareness (all types) fostered during the task motivated knowledge translation between organizations and new linkages that may be utilized in future disasters.</p> <p>The asset-mapping tool is a flexible resource to maintain situational awareness.</p> <p>Increased situational awareness altered the perceptions of the participants and motivated people to collaborate in disaster preparedness.</p>

**5.1 Other Models of Motivation**

Self-Determination Theory was chosen as part of the conceptual framework for this study because of its focus on the innate psychological needs. It is important to note that other models do exist and may be applied to the understanding of awareness and collaborative action in future studies. Some of these models include: Maslow’s Hierarchy of Needs, which identifies a pyramid of needs, each level must be satisfied before

someone is motivated to fulfill the next (Maslow, 1943); Alderfer's E.R.G. (existence, relatedness, growth) theory is similar to Maslow's though it does not assume that lower order needs have to be satisfied before higher order ones (Alderfer, 1969); and McClelland's acquired needs theory that identifies that people can be driven by different priorities related to achievement, power, and affiliation (McClelland, 1965).

## ***5.2 Limitations***

It is important to acknowledge some limitations in this study. Firstly, this thesis focused on one EnRiCH community which provided an in depth understanding of awareness and collaboration in Truro; though this information may not be generalizable to other populations. Secondly, the community based participatory action approach provided rich information of a real world setting. However inherent in this method was attrition due to participant demands outside of the intervention and therefore some data was not captured. Thirdly, the use of a directed approach to content analysis provided a knowledge foundation from previous theories and models. Though this may have limited the coding scheme and the observation of patterns; this was addressed through the incorporation of inductive coding to allow for more flexibility and accuracy in the identification of emergent themes (Hsieh & Shannon 2005).

## **CHAPTER 6: Conclusion & Recommendations**

This study provides an understanding of how awareness influenced the psychological needs of competence and relatedness to encourage individuals to participate in collaborative disaster management activities and seek more awareness. It specifically identified the interaction between the ED Model of Awareness and Self-Determination Theory to acknowledge how awareness may be translated into collaborative action through the consideration of motivational elements. It identified strategies to improve inclusion of high-risk populations in disaster management activities and in turn promote community resilience.

The psychological needs of competence and relatedness presented in this study may be used as potential metrics for awareness and collaborative action that could be further tested to improve The ED Model of Awareness. This enhanced understanding of awareness will provide a framework for future studies to investigate further relationships between awareness, motivation and collaborative practice in disaster settings. For example, investigators may examine if influences on the psychological needs changes before, during, or after a disaster, and how to further support them to improve resilience. Researchers may also look at applying the model to different disaster scenarios to discover how awareness influences collaboration during different types of events. Finally, other models of behavior may be combined or compared with the ED Model of Awareness and Action to confirm and expand the results presented in this thesis.

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## APPENDIX A: EnRiCH Interview Guide

This appendix presents the EnRiCH Interview Guide used in the telephone interviews to assess community collaboration throughout the project. Probes that were added throughout the process are indicated with an asterix (\*).

**Reference scale for the questions where they are asked to provide a rating (1 = lowest; 5 = highest).**

*Definition of connectedness:* the extent to which you feel connected or linked with a web of people, organizations, resources and information in your community.

1. Please describe the organizations you work with in your community.  
Probe: In your work, do you do any direct care for people with functional limitations?
2. Please indicate the number of community organizations you work with on a daily basis (weekly? monthly?) in the context of performing the duties for your work (paid or unpaid).
3. Connectedness has been defined as (give definition). On a scale of 1-5, how would you describe the extent of your connectedness in your community?  
  
Probe: Are you satisfied with this level of connectedness? If not, how would you like to change it?
4. On a scale of 1 to 5, please rate how your organization supports or encourages collaboration?
  - Probe: Please explain your rating
  - Probe: What type of support is provided for collaboration?
  - Probe: What challenges have you encountered in trying to collaborate? Can you provide a specific example?
  - Interviews 2-4: Has this changed since your last interview?
5. Using the same rating scale, how confident do you feel about your ability to fulfill your responsibilities in a disaster response in the event of a community disaster (such as an ice storm, flood or fire)?
  - Probe: Please explain your rating

6. On a scale of 1 to 5, how would you describe the potential of this collaborative group who are participating in the EnRiCH project to sustain its activities over the next year?
  - Probe: Please explain your rating
7. Using the same rating scale, how would you describe the political climate in your organization with respect to supporting collaboration with the participants in this EnRiCH group in your community?
  - Probe: Please explain your rating
8. On a scale of 1 to 5, would you say you have the resources (equipment, money, people) you need to sustain collaboration with this group?
  - Probe: Please explain your rating
9. On a scale of 1 to 5, how likely is it that you will participate in the online component of the collaborative task over the next month?
  - Probe: Please explain your rating
10. What do you hope to get out of your participation in the EnRiCH session (project)?
11. Please rate your sense of belonging to this EnRiCH collaborative group in your community using the same 1 to 5 rating scale. (Interviews 2-4)
  - Probe: Please explain your rating
  - Probe: What was your sense of ownership over the group? \*
  - Probe: Do you feel you can express your opinion within the group? \*
  - Probe: What do you think about the trust/openness amongst the group? \*
  - Probe: Over the past months, has the degree of trust and openness between group members increased, remained the same, or decreased? \*
12. Please describe how this collaborative group has structured itself.
  - Probe: What type of leadership has evolved within the group?
  - Probe: Has it been effective?
  - Probe: What makes that type of leadership successful? What are the skills found in the leader? \*
  - Probe: To what extent do members share roles and tasks? \*
  - Probe: What are the relationships like? How would you describe the relationships?
  - Probe: How satisfied are you with your influence in the group? \*
  - Probe: Does this group have the right mix of people?

- Probe: What, if anything would you change about the structure?

13. Has your participation in the project influenced the way you work?

- Probe: What benefits have you gained from working with this group? \*

14. Please describe whether your perceptions of preparedness for disasters has changed or remained the same over the course of this project.

- Probe: Have you done anything differently in terms of your own preparedness for disasters?

15. Has the group identified any common goals after the EHRIT Mapping Session?

Probe: How was this process accomplished?

16. Please describe the level of commitment among the group.

- Probe: Are you satisfied with the way the people and organizations work together? \*

17. Have any new people joined the group?

- Probe: How were they integrated?
- Probe: What were the challenges that new members faced in integration?

18. Please explain any relationships between this group and the connectedness in the community at this time.

19. Have there been any major changes in the community within the past month?

20. How does this collaborative group make decisions with regards to the contingency plans?

- Probe: How committed to you feel to the decisions that are being made by the group? \*
- Probe: How much is the group able to make the necessary decisions in order to keep the project moving forward? \*

21. How does this group communicate internally? Externally? Informally? Formally?

22. Do people with functional needs participate fully in contingency planning with this group?

- Probe: What accommodations are made to facilitate this?

23. In the past month, have there been any major changes in the direction this collaborative group is going?
24. Please describe the process that has evolved to develop the contingency plans in your organization and in the community.
  - Probe: Do you feel your viewpoint is reflected in the contingency plans (or the work that has been accomplished to date)?
  - Probe: Is anything missing from the plans?
25. Has the work of this collaborative group had any influence on the resilience of this community?
  - Probe: What kind of influence you saw the process having in the community if there was any? \*
26. Is there anything that you've liked to seen done differently with regard to the project? Is there anything you want to add on (the sessions, the group, where are we going)?

## APPENDIX B: Additional Supporting Quotations

This table presents additional supporting quotes for each theme presented in the results section. Themes are presented on the left with supporting quotes on the right. The quotes for the first theme are further subdivided by headings to depict the type of driver (autonomous, controlled, combined) experienced by participants.

Theme	Supporting quotes
<p><i>Awareness influenced the underlying psychological needs of competence and relatedness to encourage autonomous motivation for collaboration</i></p>	<p><b>Autonomous</b></p> <p>P5 Int 2 “what do I want out of this? I don't want to lay this on but there's kind of a spiritual thing out of this too and if we can have our communities more tuned to looking after our communities, that's where we're going nationally anyway. If you look at our overall health care, and what's happening there, it's moving more and more and more to the community and, I don't know, somehow I believe that the country was built by small communities anyway and I think that overall what I would like to see would be, ya we would prepare for disaster but we would prepare for disaster but we would just prepare for caring for one another...I really believe that everything we do along this line comes back to building community.”</p> <p>P15, Int 3 “Yes because it's up to me to be connected, Well that's my responsibility and I enjoy, you know, seeking out things in the community and that's one of the things that I enjoy doing for my group-is getting programs up and running. So I look out for things and read the paper and see where we can be connected to things...I'm always looking for information that I can pass on.”</p> <p>P16, Int 4 “Well I like to think at some point I'd be able to help somebody, and also, I don't know if, other people feel this way or not, but in this kind of instilled the feeling of being useful. That we will play even if we had a disaster that we can still play a part.”</p> <p>P24 Int 2 “Yes it makes me feel very good about myself, you know that I'm helping other people.”</p> <p>P24 Int 4 “I'm hoping I'm able to help teach the people about it-getting prepared for an emergency and it keeps me focused on doing it too. I kind of enjoy getting the message out there to people.”</p> <p><b>Controlled</b></p> <p>P3, Int 1 will you participate in google docs? “If I'm being asked to participate in that way, it's something that I'll commit to and follow through with. I have no problem doing that.”</p> <p>P22 Int 5 “not a lot of people stepped up to take that leadership role. And I think that, without the proper funding supports in place, it will be just another thing I have to do. It will be important but when something else comes up, it will be put to the side, which is why I'm working on a funding proposal now.”</p>

	<p>P32, Int 5 “I think for us to from a selfish standpoint it makes our job easier once you know which organizations will require assistance and it cuts back on time, and it can also be proactive so we can give them more information before something happens.”</p> <p><b>Combined</b></p> <p>P9 Int 1 “I just want to say that, I wanted to take part in this because it's really important to me, and it's really important for the people that we service, but it's also important for the whole community, and I kind of don't-I don't look at, like, black and white-I look at-I try to look at the whole picture, but I don't think-I don't think the [Organization] as a whole does-looks at it that way. So being a part of this, I'm hoping that, that will help support the [Organization] to look at it in a different light, and to have, you know, to have a part in this.”</p> <p>P14 Int 1 “I'm looking forward to- I supervise the staff that are involved with it (EnRiCH) so far, but I'm looking forward to becoming more ingrained into what's going on in the project itself. And to be meeting some other people that are going to be participating so...I think there's going to be excellent opportunities for sharing and learning and I think the outcomes are gonna be fantastic. And be very beneficial, again, to be my home community and then something that the [Organization] can be proud of.”</p> <p>P14 Int 2 “I was looking at the tool today and I'll participate in any way that I'm asked, and in any way that I can because the more prepared that we can help make people, the more information that we can share and the more resources that we can provide, is only going to make our job easier and then allow us to refocus our efforts on those that aren't quite so prepared or have other vulnerabilities. So it's a win-win situation, I think, for the community as well as for our organization.”</p> <p>P22 Int 2 “You know what, my philosophy is if you want it done right, you gotta do it yourself [laughter] so that is my philosophy. I don't see anybody else stepping up or connecting with me to say, 'Hey, look through this, look through that.' and unfortunately there is only one of me. Will this fall to the wayside? I'm hoping it won't! cause I think it's a very important tool for me reaching my goals within this organization. Could I use an extra hand on it? Absolutely yeah.”</p> <p>P5 Int 3 “What I would like is, I would like to see it work...Number 1 for hazard preparedness of course. But also, I think that when projects like this work, you see community building out of it. And I would like to see at least one more focal point for the community. The other thing that I'm hoping will develop for [name] and I is that we will develop more contacts for doing the personal preparedness.”</p>
<p><i>Awareness of group assets and needs is necessary to ensure collaborative activities are accessible to all participants</i></p>	<p>P11 Int 1 “I have MS myself. But I mean, when I go to the disability meetings, when the end comes, I don't know if it's help or not, but those that are in wheelchairs, I'll get up can serve them and stuff like that, but no I don't-I'm more of a person like, as I said, when I come to the Red Cross, I'm here on like, the front desk, and I'm the phone person. I call, and they get me to do...they'll call me, and I'll do the calling.”</p> <p>P18 Int 2 “I find that I can't stand. I can't walk very much because my feet end up hurting so badly that I have to sit down...As far as helping in a disaster, I could use-If it was to put people's names down and what's wrong and anything like that, that would be fine. But for the --You'd have to do any manual labor. I don't think I'd be able to do much with that way.”</p>

<p><i>Awareness initially disrupts disaster competence then reinforces it longitudinally</i></p>	<p>P3 Int 2 “Good question. I guess maybe it has reminded me to always be sure to look for, um, possible ways to collaborate in the community and perhaps it has reminded me who some of those groups of people could be that you don’t always think of.”</p> <p>P7 Int 3 “I guess it may have changed, just kind of what I said a minute ago, there. We kind of lose sign to the length of disasters and the requirements for folks down the road. After the initial response phase we just say, 'we're gonna clean up shop and move on' and I don't really consider or be cognizant of what's required, next week or next month or.”</p> <p>P9 Int 2 “I think it changed. I think, they were all within the process of having to do something more than what we're already doing, but being part of the project and meeting everyone, I know the importance, I know there's much more of an importance now, than when I started, even though I always knew it was important but just more of an urgency, say, than before.”</p> <p>P10 Int 4 “It’s raised my level of awareness and consciousness towards a disaster and that it’s got, like sometimes you’ve become very complacent and don’t even think about a disaster, but even going to the sessions and then seeing the follow-up emails and stuff like that it just makes me think; alright am I – am I ready? You know, so it has raised... raised my level of preparedness a bit just by generating – activating my mind I guess.”</p> <p>P14 Int 2 “I try to take more note of the organizations I'm working with and see, even if it's just in passing or something like that, how can this group benefit us in a disaster response? Or educating the community about vulnerabilities or hazard analysis, things like that. So it does--feel more aware of the people I'm working with and what is going on in my--here, not just in Truro, but in everything that I do. I'm always looking now to how we can make more partnerships, more agreements, and spread that net even further.”</p> <p>P14 Int 2 “there would be meetings that would have already been scheduled or a normal meeting, but now the EnRiCH project is gonna add a different flavor to those meetings. We can discuss have we added anyone new, or are we missing anybody. Even if it's not meeting with the entire group, if we're just meeting with one of them or what have you, or even a casual coffee, this is another topic that can be discussed. So I think it's very beneficial on a whole bunch of different levels.”</p> <p>P15 Int 1 “Anyway, but that's just individual. I like to know all of the information and then if I need it, it's there, and I'm not so anxious about it.”</p> <p>P16 Int 4 “I kind of never even considered Truro as a place that could have a disaster. And then it brought me back to reality where any place could have a disaster.”</p> <p>P20 Int 2 “So it actually has changed to be quite honest because my initial thoughts about preparation for disaster were for perhaps the non-vulnerable sector as much as it is now, I really, I, I never really took into account how, how many people that it would affect in a different manner, we would have to have a bit of a different response and have a different response with our partners, and it has changed.”</p> <p>P20 Int 4 “Umm they’ve definitely changed, they’ve definitely broadened, because I’ll be quite honest, prior to the group, it’s like I really just thought</p>
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	<p>of like, for example, evacuation is evacuation and I really didn't think much about some of the specialized needs, that would, you know, that could be entailed. And you know it probably wouldn't crop up in huge amounts, but, you know, it would happen enough that you need a specialized response in certain instances, so yeah, I would say it has certainly expanded my thoughts on it."</p> <p>P22 Int 5 "there's a greater level of comfort and there's a greater level of knowledge on what organizations can provide to our clients who come to us who are in need."</p> <p>P24 Int 4 "Oh yes. Like, I never had an emergency kit done up before, and now I have one and it sits in bedroom closet, ready to grab if I need to [laughs]."</p> <p>P24 int 2 "Yea well, as I said I've learned some things and learned that there is other groups that I didn't know that that existed so it has helped that way. And that so, I've learned that you know we could, we could all get together as a group and, and make things happen."</p> <p>P26 Int 4 "Oh yes definitely, It has changed the fact that I am looking at things that I can try to have on hand. And before I never bothered with it. 72 hours was just [laugh] I just didn't know what the heck you'd do in 72 hours. That was an eye opener."</p> <p>P27 Int 2 "I would feel more at ease with things, because I know now who you can contact, or you feel, I don't know, you seem more updated on things eh? and then pretty much – because I think a little bit of input of any education makes you feel more confident."</p> <p>P30 Int 4 "It was a 4. But I'm very confident now, only because of, of knowing more, you know, you guys have really brought out a lot of knowledge to each and every one of us by having us get together."</p> <p>P32 Int 5 "Yeah, it has, and again, it's mainly awareness of what other agencies are doing or what other organizations are doing...Which makes it more comforting, you don't like that to happen but it just makes it more-a little more confidence as a whole, that people are aware of what we should be doing."</p>
<p><i>Perceptions of competence influenced collaborative engagement</i></p>	<p>P1 Int 4 "I did get the sense that from many of the people there that day there was an expectation that the [Organization]-not that the [Organization] was a good agency to do this but it really should be the one to do this...I just know what [other participant] and I mean they-those staff all worked for me, so I know how hard they work out in the field, and so I know that the expectation that just because it's the [Organization] that they should be able to look after that, is something that you gotta watch, because they can just be snowed under so quickly with the expectations already in the community."</p> <p>P3 Int 2 "Yeah, I really don't know I mean certainly when people are sitting around the table, everybody's interested in wanting to be involved and so forth and you never know once everybody leaves what's actually going to happen. So, you know, I-I'm really uncertain about, again, without yourself, being the people that sit in the room with us and say 'hey let's do this'. So it'll, once everyone follows through, it'll be some will be very very keen and be able to do it, others they don't have the technical ability to do it, others they don't have the knowledge to do it, you know, it's, I really don't know. It'll be interesting to see when we all get together again in January."</p>

	<p>P5 Int 1 “I think that if the expectations are clearly laid out, and the route to meet those expectations is clearly laid out then I'd give that a 4 to a 5 (rating for project sustainability)...Just more perhaps a clarity of roles and a clarity of where we see this going beyond federal government or beyond federal funding...So I think that if roles and expectations are clear and potential outcomes are well explored and well clarified then people have something to reach for.”</p> <p>P5 Int 2 “Unfortunately I don't think that's changed much and that was one of the things that I had hoped we would do more on that day would be to link more associations together. I know we did a little bit of that at the end...Now personally I made some good contacts that day. You know like personally there were some things happened that, from mapping down the road. I'm not sure where this is gonna go when project ends and so I've been involved with a number of national projects over the years and quite often what happens is when the project happens everything happens and when the project ends, everything ends. And I guess that's where my interest in this lies now is and then sustainability after the project.”</p> <p>P12 Int 1 “One of the most positive things that I think is addressing the assumptions that other organizations have-and they might have it about your organization or somebody else's...Sustainability becomes-it may be, in terms of your terms of reference and people talk about expectations, so it becomes clear. Okay? Even if it's, I don't know, once a year and then as needed if there is disaster planning. Yeah, and I think that as long as those are clear in terms of the roles of the group and what's expected that's not a bad thing...if we're not clear about what the role of the group is, there's a lot of area for misconception. And then you get people-you know, I've been part of committees where there's a high frequency of meeting, but nothing's really being achieved. And then people drop off.”</p> <p>P14 Int 1 “I hop in and have a look at the tool and see how it's being populated and put in my 2 cents worth where I feel it will be listened to. So it's very worth-while. It's easily accessible, it's easy to get at, so yeah. I will continue to use it.”</p> <p>P14 Int 4 “I think there's a hunger for information and working together to achieve, I think everybody's working together for the same goal, I haven't experienced myself, if anything the challenge might be is managing the expectations of what the outcome of this will be, is it going to be one-stop shopping on a website or are we going to be able to provide everything that everybody needs. Which I guess is a good thing in terms of the success of the project and then it comes down to the stakeholders, how do we keep this going managing everybody's expectations.”</p> <p>P15 Int 4 “Okay, so because I have a weakness on the computer, I just did feel a little bit out of the loop, in terms of getting onto the document; however, I know how to do it, and as long as the invitation is still there, and it doesn't dissolve after a week or so, then I'm confident that I will get on the site to do it myself and to look personally, but I still have my backup person [Other participant], and I go over and visit her and look on hers. So, I mean, in that respect, she's been very helpful.”</p> <p>P16, Int 1 “I'd say 5. I have my own computer and am very knowledgeable in computers.”</p> <p>P18 Int 4 “Well, because I don't have the website up or because I can't contribute to it because I can't seem to get it to come up on my computer...So I don't know how much I can do in that particular capacity, but as far as word of mouth, and things like that that's pretty good. But as far as the computer and that I don't know.”</p>
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	<p>P20 Int 2 “No, the biggest issue that I saw was the fact that the way that it's set up online. I think it's a great idea that everybody can in theory get there, it's the fact that its hampered by the firewalls, I think will be the biggest hurdle because then people might start to lose some interest if they can't participate.”</p> <p>P24 Int 1 “I will try my hardest. With that, I'm not very good on the computer but I will try...Well, we'll give it a 3,1/2. There's a whole [?] that I'll have to try and I can see if I can do it. If not it's that I can always get [name] there, to explain it to show me, so it's not too hard of a thing, I probably can learn it pretty easy, I'm able to use the emails site so...I'll give it a try.”</p> <p>P24 Int 2 Competence with computers has dropped since the FG: participant was asked the likeliness of working online, “That might be kind of tricky for me because I'm, not very good on the computer.... yes I have a computer at home here, not very good at it...I can get emails." Participant was then asked if the training session helped: "Uh, I don't know whether it made it any more clear to me. I said I'm kind of a little on the stupid side when it comes to computers haha...I would try but I couldn't guarantee it too much in results.”</p> <p>P26 Int 1 “Well I won't be using the computer. I can't very well ask my daughter to do that, she works several hours a week. I mean, if it's not something I can't do from my own home without a computer, then maybe I shouldn't be going.”</p> <p>P28 Int 1 “When I think of myself it's my workflow that will restrict anything on the amount ill be able to do. Again I think it would depend on what we think the end goal is...It'l be strongly dependent on how it's presented and I was exposed to this over a year ago and the president was gonna be involved. So I was quite interested at the time and that's why I'm taking time to do it now so hopefully I would continue to do that for the next year.”</p> <p>P31 Int 2 “What I thought was really great was going online and having the gmail account, because I have that on my phone and it'll alert me, so that will really help...I just thought 'this is great!' cause I can be in my home, wherever I am and you know, link in, the same as with this project you know I can use my phone, I can be anywhere and just go ahead and do it.”</p> <p>P34 Int 5 “For me to show up at a meeting-and of course, we're all in the same boat right? For me to show up at the meeting, I need to know that it's going to be a meeting that my equivalent are at the meeting. So that we can discuss and make decisions based on all of us are at a capacity to make decisions.”</p>
<p><i>Group Awareness contributes to relatedness, which is a foundational element for collaboration</i></p>	<p>P1 Int 4 “I think one of the biggest things is for people to explain their role and what they can do and what they can't do. There may be a little bit of misconception around the ability for people to provide help.”</p> <p>P 5 Int 3 “I haven't really connected with the group between time. I guess I think because I had brought that up last time, it didn't seem like it was going to happen. I suggested that we could get together somewhere in between and then that didn't happen, so you know, connected, as far as today's and the interview process, and kinda backed me into a little space in my own territory.”</p> <p>P18 Int 2 “I find that you sort of get introduced but the names kind of go over the top of your head...We need something. even if it's a game or something that we can sort of get to know each other better... You might talk</p>

	<p>to the person beside you or maybe across the table from you but anybody else, I don't really know who's there or what their names are or anything.”</p>
<p><i>Leadership emerged as a key ingredient in fostering awareness</i></p>	<p>P1 Int 5 “Some of [second other participant]'s leadership skills-how she's made this work--I think that's probably rubbed off and given some other individuals some confidence, that, you know what? They can do this as well.”</p> <p>P3, Int 4 “I think that after this last meeting, the level of commitment is higher, and I think it will continue that way, with having [site coordinator] hired with the [Organization], and with folks sort of seeing where the next steps could be and will be. I think prior to, people were still kind of wondering, well, why are we all here, what are we doing, what is this going to do for our community and that sort of thing, that seeing that someone is now taking the lead as an agency to keep folks connected and try to further the project in the community, I think that will make a difference with folks' commitment because, everybody is stretched. And when you're dealing with stretched resources as it is, do you have the personal resources within your agency or yourself if you're in a volunteer capacity, to be able to continue with things. So I think that it will be-I think the commitment is higher now because people have some of those answers.”</p> <p>P13 Int 4 “Okay, I think the problem was that we had such a hard time getting into the program until the [Organization] came across with a very simple, easy way and worked first time we did their way. So everybody I think was just in a rush to get in and get the spreadsheet filled out before that last meeting.”</p> <p>P16, int 2 “I know the ones that went to the group, they're trying but that's why I'm trying to get them over to my place so I can get them less frustrated...Show them how to get in, what to do and how to use the spreadsheet and then we can all do certain parts from home.”</p> <p>P18 Int 4 “the last time we got together, I was really enthused about getting going with the [Organization], and for our group in that, and I thought, well I wouldn't mind being on that panel, where we're supposed to narrow down to just two [?] or so, and then I thought afterwards, I can't do this-I can't retain things and I thought that's not gonna work. But I think [other participant]' doing it. She's excellent... There's time when I think, oh I can't do this, but when I'm there, at the time, I think, oh, ok I understand what their saying. and then afterword, I start second-guessing myself.”</p> <p>P20 Int 4 “Somebody has to champion it. And if somebody is reaching out and making sure that everybody is still informed and aware of any changes, you know, a gentle nudge to keep people interested then I think it'll have a certain, it might not be a super high-level but it'll still be current, but if somebody doesn't do that, I think it'll probably slowly lose buy-in.”</p> <p>P22 Int 3 “Since we've last spoken, I have done some outreach to our community organizations and NGOs and other not for profits and we've planned to get together actually tomorrow.”</p>

	<p>P24 Int 4 “we got a line up of different people speak about knowing what to do and what not to do and everything and where to go, and find out where to go and stuff like this. Yea I think its helping. I know every place should be doing this.”</p>
<p><i>Awareness prompted participants to share information with others</i></p>	<p>P3, Int 4 “The plan is to introduce the online tool to my executive director, as part of us meeting with [site coordinator]. So she and I will be having a look at it and talking about our portion on there, and making any additions and changes and just making her aware of the rest of the online tool so that she has access to that resource as well.”</p> <p>P14 Int 4 “We don't talk about disaster management without talking about EnRiCH. So it's become part of our jargon and when we promote our program to anybody we talk about the collaboration and the EnRiCH project.”</p> <p>P13 Int 4 “We've really connected since we'd had these meetings through you people. I've had I don't know how many of the club and they've been running us all through their programs and whatnot. Yeah, we're really starting to get into it now. I've got a few more lined up as well. I've got a lot of contacts from there. And our club had no idea about what your program was or anything but the ones that have attended your meetings have all brought it back and then they've been asking a lot of questions, our club has. So we've been bringing the people who've attended the enrich program into our club and everyone that comes in, it doesn't matter what they talk about they also include the EnRiCH.”</p> <p>P24 Int 4 “The interest is getting out into the different varieties of groups. So last week with [site coordinator], we went to a bunch of--to a church, and had like ladies auxiliary groups, there--a bunch of women, and we showed them what all goes into an emergency kit, and showed them the kit and stuff like this.”</p>
<p><i>New awareness improved community resilience</i></p>	<p>P1 Int 5 “[second other participant] uses the example of, when the floods hit Truro, she didn't-she said to me, '[participant], I wasn't having to go through looking for people's names and looking for this' she said ' I had people connecting and connecting with me' and she said that made a huge difference for her.”</p> <p>P1 Int 5 “I think perhaps, that overall education to the general public, on what these roles and responsibilities are, what the agencies-how they can help you, I think definitely make a difference with their idea of resilience and feeling a bit more resilient, because they know what's out there.”</p> <p>P7 Int 2 “Ya, ya I think it has, I've been on the documents there a few times in Truro and just reading through the services that are available and certainly just kinda eye opening that those things are in your backyard and you can utilize them. So certainly the opportunity for resiliency is there because you got somewhere to look and all that stuff.”</p> <p>P14 Int 2 “the steps are being taken and I do think we are gonna see a fundamental change in how we're gonna be able to provide assistance to communities, how we're gonna be able to put our hands on the information much quicker, which is certainly going to mitigate the impacts of any disaster.”</p> <p>P22 Int 2 “when there's a huge disaster here in Truro I know that the relationships that we've built because of EnRiCH will come back and help the [Organization] respond and help the most vulnerable in the community.”</p>

### APPENDIX C: Development of themes

Figure 3 depicts the direct and inductive codes used to develop the themes. Each theme is listed beside the code that contributed the greatest to its creation, though information from multiple codes was used in several cases.

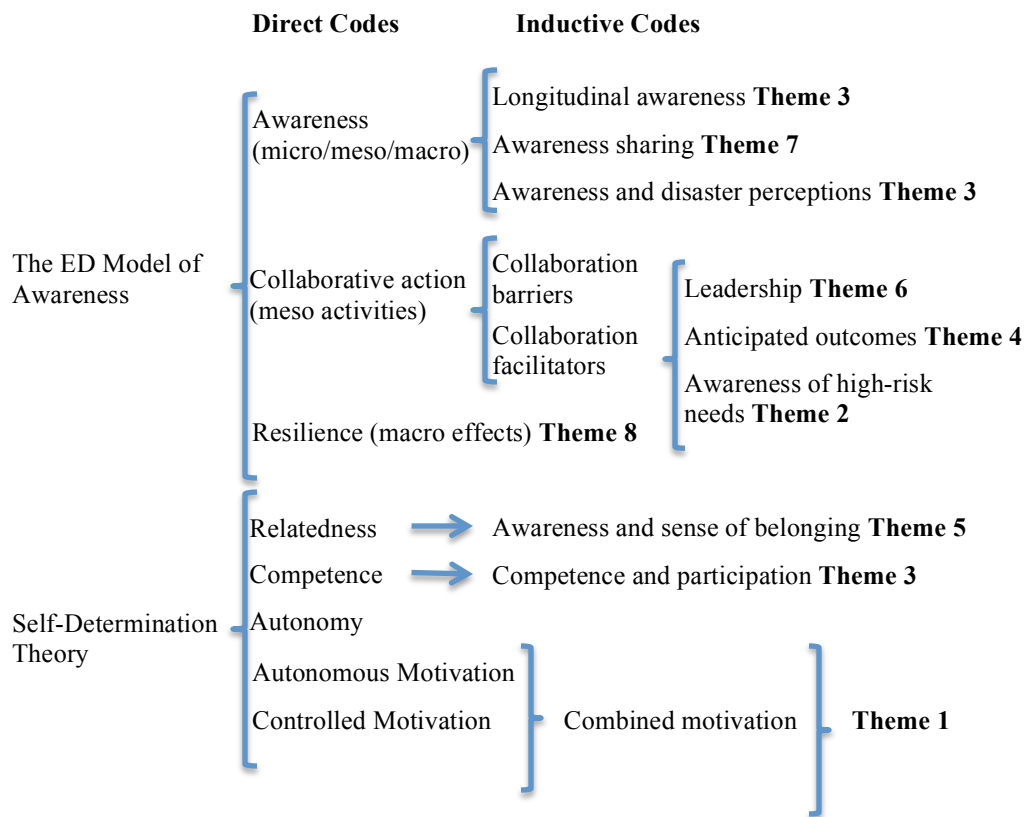


Figure 3. Direct and Inductive Codes

## APPENDIX D: Ethics Certification

File Number: 05-14-32

Date (mm/dd/yyyy): 05/30/2014



**Université d'Ottawa** **University of Ottawa**  
 Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

### Ethics Approval Notice

#### Social Science and Humanities REB

#### Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Craig	Kuziemyk	School of Management	Supervisor
Tracey	O'Sullivan	Health Sciences / Others	Co-Supervisor
Michael	Falconi	School of Management	Student Researcher

File Number: 05-14-32

Type of Project: Master's Thesis – Secondary Use of Data

Title: Awareness and Motivation in Collaborative Practice for Disaster Management

<u>Approval Date (mm/dd/yyyy)</u>	<u>Expiry Date (mm/dd/yyyy)</u>	<u>Approval Type</u>
05/30/2014	05/29/2015	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:

N/A

File Number: 05-14-32

Date (mm/dd/yyyy): 05/30/2014



**Université d'Ottawa**  
Bureau d'éthique et d'intégrité de la recherche

**University of Ottawa**  
Office of Research Ethics and Integrity

This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement (2010) and other applicable laws and regulations in Ontario, has examined and approved the ethics application for the above named research project. Ethics approval is valid for the period indicated above and subject to the conditions listed in the section entitled "Special Conditions / Comments".

During the course of the project, the protocol may not be modified without prior written approval from the REB except when necessary to remove participants from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the project (e.g., change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, including consent and recruitment documentation, should be submitted to the Ethics Office for approval using the "Modification to research project" form available at: <http://www.research.uottawa.ca/ethics/forms.html>.

Please submit an annual report to the Ethics Office four weeks before the above-referenced expiry date to request a renewal of this ethics approval. To close the file, a final report must be submitted. These documents can be found at: <http://www.research.uottawa.ca/ethics/forms.html>.

## APPENDIX E: Glossary

**Activity awareness:** involves being knowledgeable of all elements surrounding a specific collaborative task. This includes participant awareness of an activity and knowledge of the skills, motivations, and limitations of everyone else, in order to best work as a team (Carrol et al., 2009).

**Asset-mapping:** is a collaborative information gathering activity originating from the field of community development (Kretzmann & McKnight, 1996; Lemyre & O’Sullivan, 2013; Tupechka, Abbs, & Doherty, 2010). This method is used to create inventories of data regarding the skills and resources within communities and organizations, to improve awareness and empower participants (Fuller, Guy, & Pletsch, 2002; Goldman, & Schmalz, 2005).

**Autonomous motivation:** involves people choosing to complete a task based on their own internal drivers. For example, one may be autonomously motivated to complete a task because they have an intrinsic passion for it. Autonomous motivation is associated with better persistence, performance and overall psychological well being when completing tasks (Deci & Ryan, 2008).

**Autonomy:** is a person’s ability to have choice over what they want to do and to have a part in the decision-making about how it will be done. Autonomously motivated individuals identify with the value of a task and feel that their actions are self-endorsed (Deci & Ryan, 2008).

**Awareness:** is a multifaceted concept that may be defined as the knowledge that individuals or groups may possess or try to learn about a situation or activity to make decisions, provide support, and accomplish goals (Carroll et al., 2006; Carroll et al., 2009; Dourish & Bellotti, 1992; Dourish & Bly, 1992; Kuziemsky & O’Sullivan, under review; Kuziemsky & Varpio, 2011; Riley et al., 2006; Schmidt, 2002). In the context of emergency situations, awareness is non-linear, it influences many processes and is concurrently impacted by other factors through a variety of complex interactions (O’Sullivan et al., 2013a).

**Awareness of outcomes:** being knowledgeable about upcoming goals and aims of an activity.

**Collaboration:** “the process of developing and maintaining effective interprofessional working relationships with learners, practitioners, patients/clients/families and communities to enable optimal health outcomes. Elements of collaboration include respect, trust, shared decision making, and partnerships” (CIHC, 2010, p. 8).

**Collaboration competence:** Ability to actively participate in group interaction. Includes being able to voice opinions and provide input.

**Communication:** consists of the exchange of information between people to support group work (Fuks et al., 2007). Communication is a critical component of collaboration because in complex situations people must be able to share information efficiently, have the ability to solve problems, and make decisions to allow for the best outcome (CIHC, 2010; Ellis, Gibbs, & Rein, 1991; Fuks et al. 2007; Pfefferbaum, & Van Horn, 2011).

**Communities of practice:** an inter dimensional awareness building activity that refers to people learning about each others' roles and becoming more integrated in a collaborative task.

**Competence:** is the feeling of confidence of being able to complete a task and do it well (Deci & Ryan, 2008).

**Controlled motivation:** occurs when external influences such as rewards or punishments cause someone to complete a task. For example, one may complete a task because of monetary incentives or because of requests from an employer (Deci & Ryan, 2008).

**Cooperation:** is the accomplishment of tasks by groups in a shared workspace (Fuks et al., 2007).

**Coordination:** the organization of collaborative activities (Fuks et al., 2007).

**Disaster competence:** Proficiency with the elements of disaster preparedness, response, recovery, and mitigation.

**Disaster resilience:** is a process involving the ability of a community to withstand crisis, recover efficiently, and rebuild toward a state of improved functioning (Chandra et al., 2011; Norris et al., 2008; Pfefferbaum, Pfefferbaum, & Van Horn, 2011).

**Extrinsic rewards:** in contrast, focus on outside sources, such as money, trips, acknowledgments, peer pressure, etc. (Deci & Ryan, 2008).

**Group awareness:** being knowledgeable of other members during collaboration.

**High-risk populations:** those prone to adverse outcomes during natural disasters and chemical, radiological, nuclear and explosive (CBRNE) events because of functional limitations that affect ability to cope independently (Burke, Bethel, & Britt, 2012; Enarson, & Walsh, 2007; Kailes, & Enders, 2007; O'Sullivan & Bourgoin, 2010; Prashar, Shaw, & Takeuchi, 2012; Sullivan, & Häkkinen, 2011; Uscher-Pines et al., 2009).

**Individual awareness:** the awareness held by one person.

**Inter dimensional activities:** Serve to transfer awareness between levels of society.

**Intra dimensional activities:** Serve to create awareness within one level of society.

**Intrinsic rewards:** come from within a person and coincide with autonomous motivation. An intrinsic reward is linked to an individual's drive to complete a task out of enjoyment (Deci & Ryan, 2008).

**Knowledge translation:** an inter dimensional awareness building activity that refers to the influence of information as it is transferred between levels.

**Macro level:** includes the overall community and organizations such as the government and international agencies.

**Meso level:** includes interaction of teams and organizations.

**Micro level:** contains both individuals and families.

**Perceived group competence:** An individual's belief in a group's ability to succeed and accomplish goals.

**Perceived individual competence:** An individual's belief in their ability to be competent within a task; includes perceptions involving the above three types of competence.

**Relatedness:** is the inherent sense of wanting to interact and belong with others (Deci & Ryan, 2008).

**Self-determination theory:** is centered around three main universal psychological needs that must be satisfied in order for a person to feel self-determined, which enhances motivation toward a particular task. These needs are 'autonomy', 'competence' and 'relatedness' (Deci & Ryan, 2008).

**Situational awareness:** the mindfulness of critical elements such as strengths, weaknesses, and needs, surrounding an immediate or closely approaching event. This knowledge is used to make decisions, plan courses of action, efficiently respond, and accomplish goals (Riley et al., 2006).

**Technological competence:** Proficiency when using technology, such as computers.

**The ED Model of Awareness:** A model that focuses on the presence of awareness across the micro, meso, and macro levels of society (Kuziemsky & O'Sullivan, under review).

**The ED Model of Awareness and Action:** An expansion of the ED Model of Awareness that includes motivational elements prompting the transfer of awareness between the levels of society.

**The EnRiCH Project:** is a community-based participatory research project focused on enhancing community resilience and preparedness among high-risk populations (O'Sullivan et al., 2013a).

**Whole-of-society approach:** engages all sectors of society, from government to the general public, to participate in disaster preparedness and response (FEMA, 2011; WHO, 2013).