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## Crisis management simulations: Lessons learned from a cross-cultural perspective

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### Abstract

Emergency crisis management is a highly dynamic and complex domain. It challenges performance and increases reliance on information, technology, people and context. Crisis events are something to which all nations must respond, however processes, policies, and responses to those events may be culturally defined. Culture, described as a set of characteristics, values and behaviors manifested within a group of people and shaped by historical experiences means that cognition can no longer be thought of as being universally the same across populations. To explore the role of culture within decision-making and distributed cognition, an initial collaborative pilot study was undertaken with the University of Manchester. The goals were to collect case data on the strength of cognitive and behavioral variables related to culture as it is operationalized within the NeoCITIES emergency response simulation. The study purported to test the influence of a naturalistic culture (U.S. and U.K.), hidden knowledge, and time stress on team performance to provide an initial understanding of how culture impacts cognition within an emergency crisis management setting. This initial study was a successful proof of concept that NeoCITIES could be used in an international comparative experiment. Although we did not achieve results with our initial pilot study, several significant lessons were learned in carrying out this cross-cultural research.

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## 1. Introduction

Situated, distributed cognition within our global society is prevalent owing to new social technologies, which facilitate problem solving and communications across distances. Teams are often employed in these settings to deal with complex and emergent problems across a variety of domains. Crisis management, for example can be thought of as socially distributed cognition that is necessarily teamwork focused and emergent over time as new elements of the context are revealed and become salient to the intentions at hand. As part of the new world order of socio-technical systems, we surmised that culture and beliefs play a prominent part in how distributed cognition plays out in various domains, and particularly in teamwork. “Common in many of the definitions [of culture] is the notion that culture is a whole set of symbolic resources of a given community, such as lay theories, icons, scripts, and schemas (Adams & Markus, 2004). The symbolic resources of culture are accumulated and transmitted across generations and are usually externalized into social practices and social institutions” [1, p. 138].

The intent behind our research then was to utilize the Living Lab framework to understand how forms of culture might differentially impact team performance within emergency crisis management situations [2]. A major part of this approach was the utilization of NeoCITIES, a human-in-the-loop, scaled world simulation [3]. We had an opportunity to conduct the simulation with British students at the University of Manchester as well as American students at Pennsylvania State University to potentially enable contrast and comparisons of two distinct cultures. While this opportunity provided a great deal of promise to help understand how distributed cognition might vary when team members from differing countries participate, the actual development and implementation of the study and simulation in another country provided ample insights into practical difficulties than can ensue. While part of this paper elaborates the foundation and basis of a cross-cultural comparison, a main objective is to (1) reflect on many of the issues, problems, and constraints that emerge when all the details and considerations are laid out; (2) project lessons learned and answers for future researchers in this arena to consider when engaging in cross-cultural research and international work; and (3) to enable future considerations of cross-cultural and intercultural work within crisis management as socially distributed and socially constructed cognitive work. The paper begins with research history and foundations, and then continues with methods and reflections about practical aspects of this research.

## 2. Research foundations

Across many domains, teams are employed to carry out tasks in order to address complex problems. A team is defined as "a distinguishable set of two or more people who interact dynamically, interdependently, and adaptively toward a common and valued goal/object/mission, who have each been assigned specific roles or functions to perform, and who have a limited life span of membership" [4, p. 4]. In many instances, teams must interact and engage in problem solving with teams from different cultures. Oftentimes, these multicultural interactions can be fraught with misunderstandings for both team members and for organizations. As such, it is important to understand the ways in which culture impacts individual and team cognitions. However, often this work is underrepresented in the literature as cross-cultural and cross-site research can represent a significant effort to carry out, not only due to the complex nature of examining culture in an experimental setting, but also in the logistical requirements inherent in using multiple populations from different nationalities.

Likewise, the domain of emergency crisis management is highly complex, changing in ways that challenge performance, and becoming increasingly reliant on information, technology, people, and context. Unfortunately, crisis management strategies are often not informed by principles of organizational psychology, human factors or team cognition. Similarly, the interfaces and tools designed to facilitate collaboration in a crisis are often technology-centric, haphazard in design, and devoid of any cultural considerations [5]. In many cases, just defining what culture is and how it is measured is daunting, let alone determining how it works as a variable of influence in teamwork [6].

Contemporary emergency crisis management is characterized by multinational responses wherein distributed teamwork is enabled through the use of an array of collaborative technologies [5]. Yet we have seen that culture leaves its mark on real world situations that involve crises, impacting the way people interact, how they view the world, and how they process information and enact biases. Culture, described as a set of characteristics, values and

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