"Whoever saves one life, saves the whole world"

Babylonian Talmud Tractate Sanhedrin 37a

Are We Protected? Model for Predicting the Level of Perceived Secureness in the Face of Large-Scale Emergencies

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Why do we need to deal with emergency preparedness?

The National Palace (the official residence of the Haitian President) following the earthquake of January 12, 2010

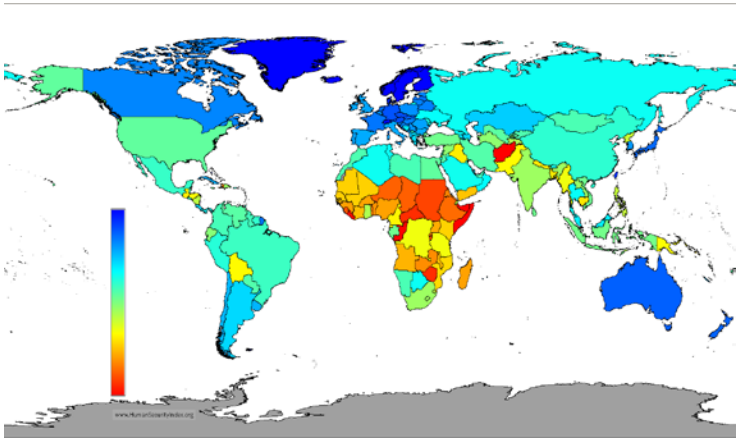
Why do the social sciences need to develop novel conceptual models for emergency preparedness?

- The social, psychological and organizational dimensions in emergencies are very important.
- The assumption that human activity can minimize the potential damage of emergencies is fundamental for risk and emergency management (Beck, 1992).
- The need for novel models - the decades-long research focus on descriptive models for the post-disaster stage has resulted in relatively limited explanatory quantitative research analysis of the pre-disaster phase (Rodriguez, Quarantelli & Dynes, 2007).
- Practically applicable conceptual models may bridge the gap between practitioners and researchers, and promote common language and professional perspectives.

“Prediction is very difficult, especially about the future”

Are we protected?

Model for predicting the level of perceived secureness in the face of large-scale emergencies



Human Security Index Version 2.0 – December, 2010. Source: www.humansecurityindex.org

The main research question

What components may constitute integrated assessment of human perception of emergencies, and how may this assessment contribute to the effectiveness of emergency preparedness?

Source:
www.nvrc.org

Why do we need a new concept, "perceived secureness" ?

Meta-analysis across the globe (Solberg, Rossetto & Joffe, 2010) showed that as opposed to the traditional approach , earthquake risk perception is weakly related to seismic adjustment . It means that the analysis of the relationship between risk perception and preparedness is not a promising research path and there is a need to look for an alternative.

What is the ultimate goal? To achieve adequate state of preparedness, that is in accordance with the risk. The appropriateness of preparedness should be measured by the proportion of it and the risk. This proportion is defined as perceived secureness.

Lay citizens are very important stakeholders in emergency management and therefore it is very important to understand their perceived secureness. In future studies, the perceptions of other stakeholders may be measured.

What are the components of perceived secureness?

The main components of perceived secureness are perceived preparedness (numerator) and risk perception (denominator).

The comprehensive definition of perceived preparedness in this study includes: perceived mitigation, perceived immediate institutional response and perceived ability to cope with the economic, social and psychological consequences of the emergency.

The comprehensive definition of risk perception in this study includes: perceived dangerousness and the perceived probability of an emergency.

Therefore, perceived secureness is measured not as an intuitive phenomenon by the respondents, but through a broad set of specific indicators.

Novelty of the research

- Consolidation of a novel integrated parsimonious concept of perceived secureness, that encompasses through mathematical proportion *perceived preparedness* (numerator) and *risk perception* (denominator).
- Breadth of the scope: simultaneous examination of perceptions of the lay citizens regarding the national, local and household level, in the context of two types of national emergencies in the Israeli case –earthquake and war.
- Construction of the new measurement tool to examine the research variables.
- Consolidation of a comprehensive analytical framework.

Questionnaire and statistical methods

The novel research questionnaire built for the current study including 115 items: 38 were earthquake-related, other 38 were war-related; plus 29 questions were socio-demographic.

Statistical analysis included descriptive statistics for all the research variables, measurement of coefficients of reliability for each variable. In addition, the following statistical tests and procedures were conducted: Spearman's correlation, Wilcoxcon matched pairs test and linear multiple regression. In addition, the models were built using Structural Equation Modeling (SEM).

Variables in models for war and earthquake

Independent variables:

1. **Attitudes (regarding the national, local and household levels) towards protection in the face of emergencies**:

    A. Clarity of a protection mission.

    B. Positive/negative outcome expectancy.

    C. Perceived responsibility.

    D. Importance of protection improvement.

2. **Worry regarding the emergencies**.

3. **Socio-demographic variables**

Dependent variables:

1. The level of perceived preparedness regarding the national, local and household levels

2. Risk perception regarding the national, local and household levels

3. The level of perceived secureness as a proportion between perceived preparedness and risk perception

Selected Results

Table 1. Wilcoxon signed-ranks tests for worry and risk perception, according to type of emergency

(*Z* – Statistical measure that evaluates difference between medians of the compared variables; P reflects the statistical significance of the Z value)

Compared variables		Z	P
Household worry about earthquake (3.06)	Household worry about war (3.82)	-3.74	P<0.001
Household earthquake risk perception (1.95)	Household war risk perception (2.69)	-3.48	P<0.001
Local earthquake risk perception (1.96)	Local war risk perception (2.67)	-3.16	P<0.01
National earthquake risk perception (2.23)	National war risk perception (3.08)	-4.05	P<0.001

Table 2. Wilcoxon signed-ranks tests for perceived preparedness and perceived secureness, according to type of emergency

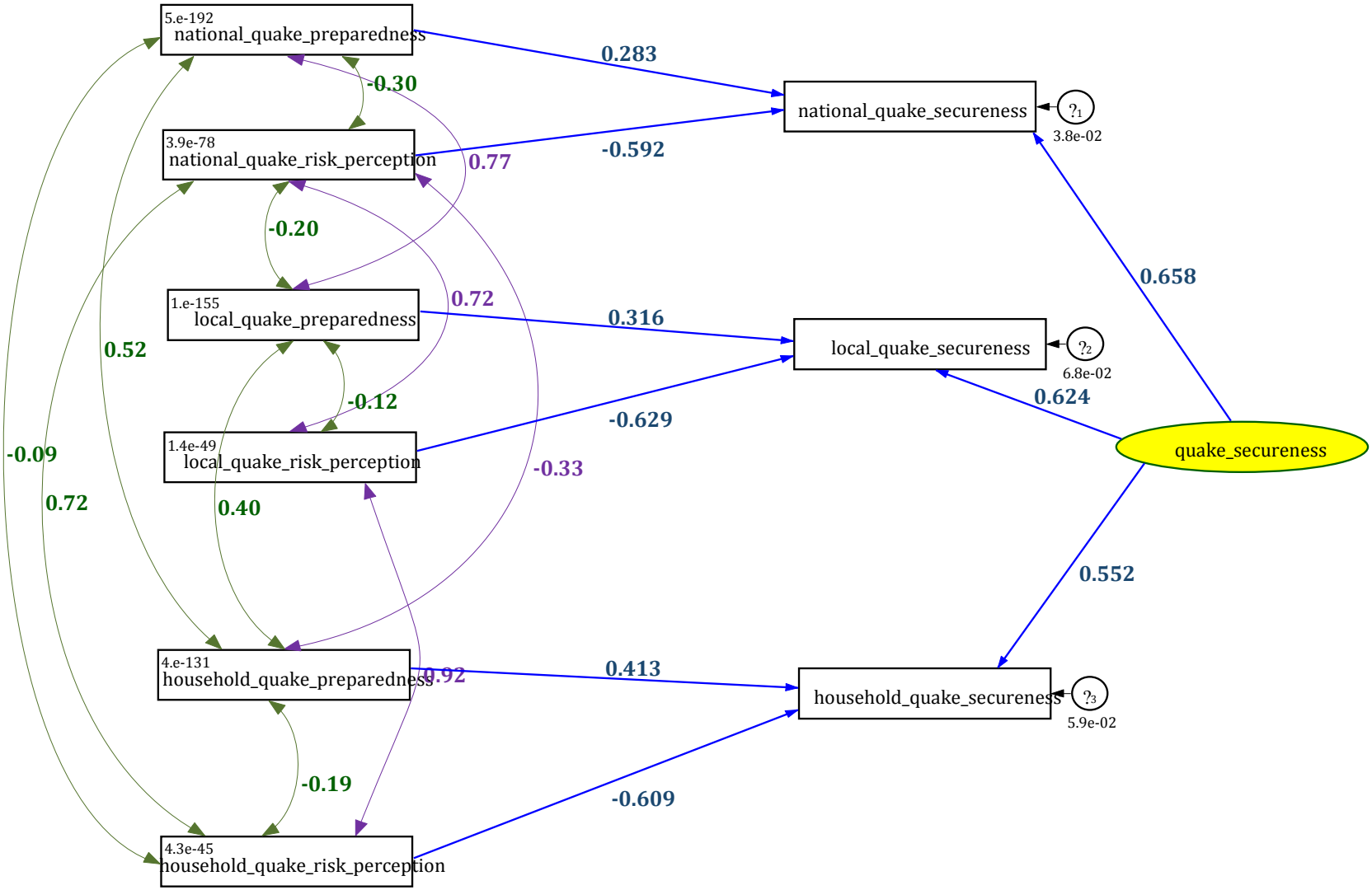
(*Z* – Statistical measure that evaluates difference between medians of the compared variables; P reflects the statistical significance of the Z value)

Compared variables		Z	P
Household earthquake preparedness (2.80)	Household war preparedness (3.26)	-4.11	P<0.001
Local earthquake preparedness (2.84)	Local war preparedness (3.28)	-4.28	P<0.001
National earthquake preparedness (3.02)	National war preparedness (3.5)	-4.58	P<0.001
Household war secureness (1.42)	Household earthquake secureness (2.35)	-1.88	p<0.1
Local war secureness (1.5)	Local earthquake secureness (2.26)	-1.73	p<0.1
National war secureness (1.27)	National earthquake secureness (2.02)	-1.78	p<0.1

Earthquake Secureness

SEM (Structural Equation Modeling)-based Model

*explanations will be presented in the 'conclusion' section



War Secureness

SEM (Structural Equation Modeling)-based Model

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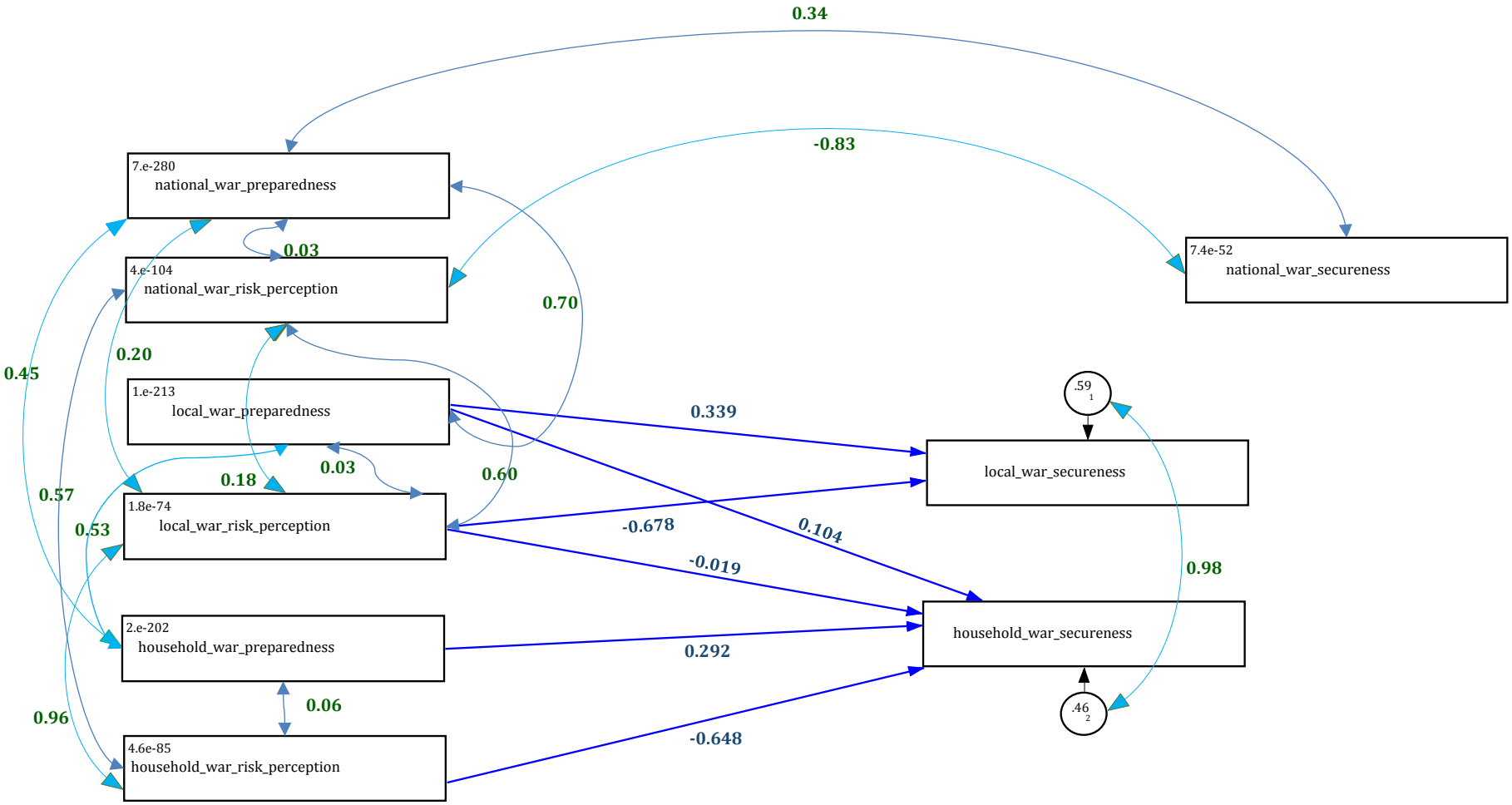

Discussion and Conclusion

- Comparative analysis of SEM models: the novel parsimonious concept of perceived secureness was found to be context - and-dimension-sensitive. In terms of context, it distinguished between an earthquake and war and in terms of dimension it distinguished between the national, local and household level. Consequently, it may serve as an effective tool for scientific analysis, risk communication monitoring and public policy consolidation.

- There were found low and mostly insignificant associations between risk perception and perceived preparedness in all contexts and dimensions - in line with the most updated literature, but different from the accepted public policy throughout the world.

Discussion and Conclusion

- Another evidence for the added value of perceived secureness: while both perceived preparedness and risk perception were found significantly higher in all settings (national, local and household) in the case of war than in the case of earthquake, their proportion (i.e. perceived secureness) was found higher for earthquake than for war (although the statistical significance was not high - $p<0.1$).
- The presented models fill a lacuna in the study of risk perception and emergency preparedness. There is a need for further conceptual development and collection of additional extensive empirical data in various contexts. The presented study is an initial step in a long-term research plan.

Discussion and Conclusion

- Implications for Disaster Risk Reduction (DRR) and humanitarian cooperation for a turbulent region (the Middle East) in especially turbulent times (nowadays) [because earthquakes and other natural disasters do not recognize political borders]:
  - Scientific cooperation in social sciences as well as practical emergency preparedness work could promote mutual understanding between Israelis, Palestinians, Jordanians and others.
  - Hopefully, the regional expansion of this research could also modestly serve the important goal of increasing the mutual understanding and assistance in the region.

Thank you very much for listening!!