

Resilience Monitor

Development of a measuring tool for psychosocial resilience

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Table of contents

Management Summary	6
1. Introduction.....	11
1.1 Background.....	11
1.2 Research set-up.....	11
1.3 Reading guide	12
2. Literature search	14
2.1 Introduction	14
2.2 What is psychosocial resilience?.....	14
2.3 Factors that affect psychosocial resilience.....	14
2.4 Conceptual framework	16
3. Questionnaire Resilience Monitor: construction and set-up.....	18
3.1 Introduction	18
3.2 Advisory board.....	18
3.3 Operationalisation of the conceptual model.....	18
3.4 Usability test.....	23
3.5 Internet survey.....	24
3.6 Methodology regarding chapter 4 and 5.....	25
4. Description of measuring data.....	27
4.1 Response and sample distribution.....	27
4.1.1 Introduction.....	27
4.1.2 Sample survey and response	27
4.1.3 Socio-economic features of the respondents	27
4.1.4 Conclusion	29
4.2 Psychological resilience.....	30
4.2.1 Introduction	30
4.2.2 RS-nl.....	30
4.2.3 Exploratory components analysis	35
4.2.4 Conclusion	37
4.3 Social context	39
4.3.1 Introduction.....	39
4.3.2 Sub-scale Social Optimism	39
4.3.3 Community Involvement Scale	40
4.3.4 Attachment to place.....	42
4.3.5 Exploratory components analysis	43
4.3.6 Conclusion	44
4.4 Trust in government and information	46
4.4.1 Introduction.....	46
4.4.2 Trust in information.....	46
4.4.3 Government capacities	53
4.4.4 Trust in Government and information	56
4.4.5 Conclusion	57
4.5 Impact and behaviour in scenarios	59
4.5.1 Introduction.....	59
4.5.2 Flu	59
4.5.3 Terrorist bomb attack	60
4.5.4 Collapse Nieuwe IJsselbrug.....	61
4.5.5 Impact of the three different scenarios	62
4.5.6 Exploratory components analysis	63
4.5.7 Conclusion	63
4.6 Factual knowledge	65
4.6.1 Introduction.....	65
4.6.2 Level of knowledge of the respondents.....	65
4.6.3 Conclusion	67
4.7 Summary results chapter 4	68
5. Testing of the internal correlation between concepts.....	69
5.1 Introduction	69
5.2 Psychological resilience vs. Psychosocial resilience.....	69

5.3 Trust in Government and Information, Impact and Behaviour, Factual Knowledge	72
5.4 Comparing outcomes	78
5.5 Conclusion	78
6. Summary and conclusions.....	79
6.1 Introduction	79
6.2 Process steps in this research	79
6.3 Limitations and usability.....	80
6.4 Conclusions	81
6.5 Implications	84
6.6 Recommendations	85
References	86
Annexes.....	92
Annex 1. Questionnaire & protocol resilience monitor	93
Annex 2. Model psychosocial resilience after disasters.....	100
Annex 3. Methods literature search.....	102
Annex 4. Overview Definitions	103

Management Summary

Objective

The objective of the project Resilience Monitor is to develop a measuring tool, which can be repeatedly implemented to discover the degree to which Dutch people are able to overcome a disaster or a shocking experience. The measuring tool is administered individually.

Factors to be examined

Based on the literature search and after discussion with the advisory board, six factors for examination were determined (chapter 2; § 3.3)

- (i) Psychological Resilience: this is related to the respondent's personality traits that influence resilience, including self-reliance, discipline, and perseverance;
- (ii) Social Context: this is related to the perception respondents have of their social network, including the degree to which they think they can rely on this social network and the activities they develop in their (living) environment;
- (iii) Relation to the Government: this concerns the trust citizens have in information and capacities;
- (iv) Socio-economic Position: this is related to socio-economic factors such as gender, age, education and income;
- (v) Impact and Behaviour: this is related to the expected behaviour of respondents after a disaster and the degree to which they will be affected by it.
- (vi) Factual Knowledge: the respondents are asked several questions concerning factual knowledge about national and international disasters.

Conclusions general trends of psychosocial resilience amongst Dutch

Psychological resilience

Dutch people consider themselves to be highly resilient. They think that they will be able to recover well after a disaster or crisis.

Social Context

Dutch people are satisfied with their social context. They generally feel that they have enough social contacts they can rely upon during difficult times. They also consider their own functioning within this context as satisfactory (§ 4.3.6)

Trust in information and government

The Dutch consider information provided by the government reliable, comprehensive and complete. In this regard, the national government receives a higher score than municipalities do. Most trust is given to classic sources of information: newspapers, radio and TV. Information provided by social media is considered less reliable, less comprehensive and less complete. In this regard, relatively young Dutch people (up to 36 years of age) appear to have a more positive view, in particular concerning comprehensiveness and completeness.

The Dutch trust that the local and national governments have the capacity to prevent a disaster, or to control it. (§4.4.5)

Impact and Behaviour

Generally, the Dutch tend to follow advice provided by the government and also gather a large amount of information. (§4.5.7)

Factual Knowledge

The Dutch have rather a high level of knowledge about disasters and crises; particularly when it comes to Dutch events and international events that have been on the news quite often (Katrina, 9/11). Questions about circumstances were answered correctly more often than questions about figures such as exact dates or number of victims. (§4.6.3)

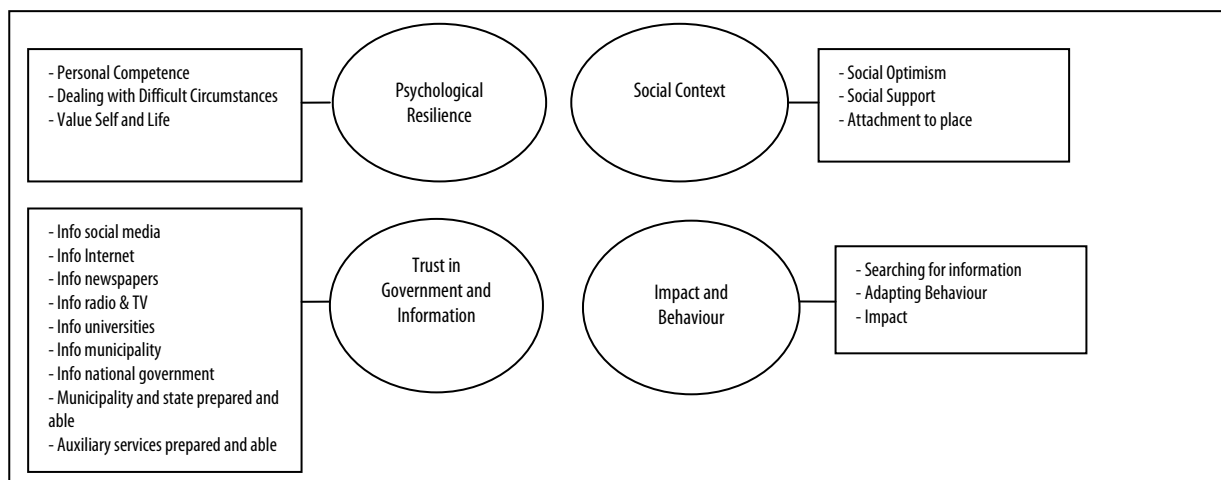
Socio-economic Position

No (strong) statistical correlations were found between socio-economic factors and the other resilience factors.

Association of factors

The associations between factors that influence psychosocial resilience were charted. Every factor consists of different components. Psychological Resilience, for example, consists of 3 components: Personal Competence, Coping with Difficult Circumstances, and Acceptance of Self and Life. Each of these components comprises a set of questions from the questionnaire (chapter 4; §5.2; §5.3). In figure 1 the set-up of the factors is illustrated.

1. Factor Set-up

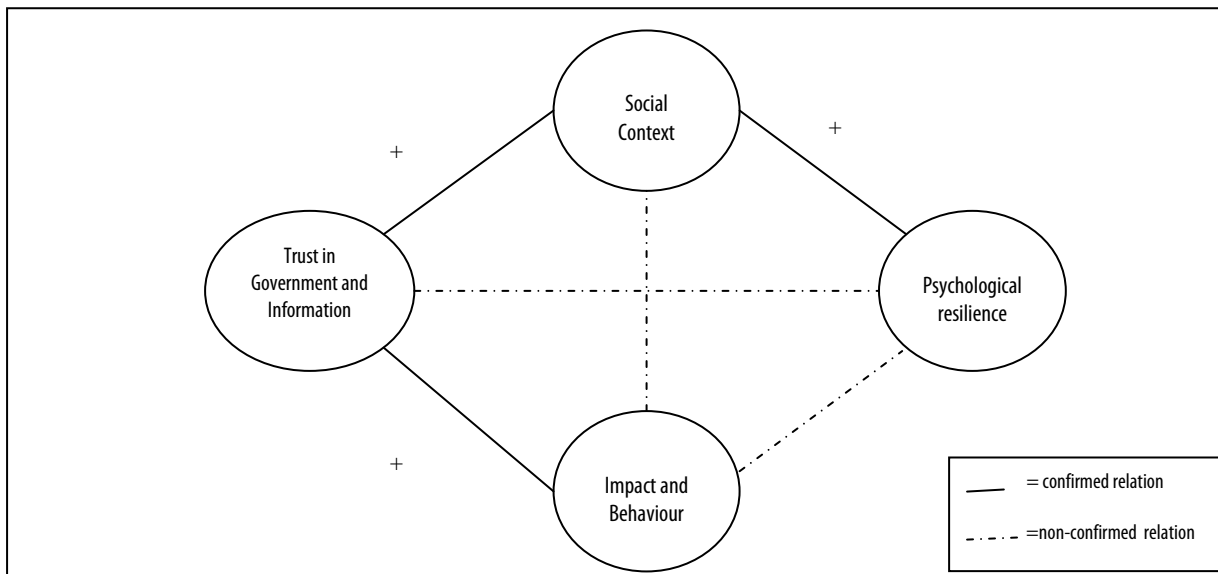


In the figure above, the factors Factual Knowledge and Socio-economic Position are not presented:

- The analyses in chapter 5 demonstrate that Factual Knowledge weakly associates with Impact and Behaviour, but does not show any connections to the other factors. Accordingly, having factual knowledge about disasters and crises does not appear to contribute directly to the level of psychosocial resilience;
- It is expected that underlying socio-economic features will influence each of the connections between the factors. In order to avoid an excessively complex model of associations, the choice was made to exclude Socio-economic Position as a separate factor.

The correlations that were examined are displayed schematically in figure 2.

2. Factors in psychosocial resilience and (non) confirmed relations



The following is established:

A direct positive association is confirmed between (solid line):

- (i) Psychological Resilience in Social Context;
- (ii) Trust in Government and Information and Social Context;
- (iii) Impact and Behaviour and Trust in Government and Information.

Direct associations were not confirmed between (dotted line):

- (i) Psychological Resilience and Trust in Government and Information;
- (ii) Psychological Resilience and Impact and Behaviour;
- (iii) Impact and Behaviour and Social Context

Limitations

For the conclusions of the current research several limitations apply: (§6.3)

- The results are based on self-assessments of the respondents. Actual resilient behaviour will only be displayed during and after an incident. Follow-up research is required to demonstrate whether prior self-assessments match the actual behaviour in a future situation;
- The research was carried out during a period in time that was marked by relatively little social unrest that could be attributed to a disaster or a shocking event. The respondents were therefore probably lacking a framework in which they could place their assessments, perhaps causing overly positive response;
- The research is based on a sample survey and represents random results. Follow-up research based on another sample survey may possibly show a different outcome;
- This research is a first, ambitious attempt to capture the psychosocial resilience of Dutch people in a questionnaire. Further tests are required to confirm the established connections.

Usability of the monitor

The resilience monitor can contribute to policymaking in several ways:

- By using the monitor it is possible to gain insight into Dutch people's view on their own psychosocial resilience on a certain moment and the four relevant factors;
- The present research explores the key factors associated with psychosocial resilience and how they correlate. Accordingly, it provides the means to enhance and stimulate resilience after disasters or crises.

Implications

The results identify a main trend in psychosocial resilience, helping policymakers in establishing their course for further policymaking: (§6.5)

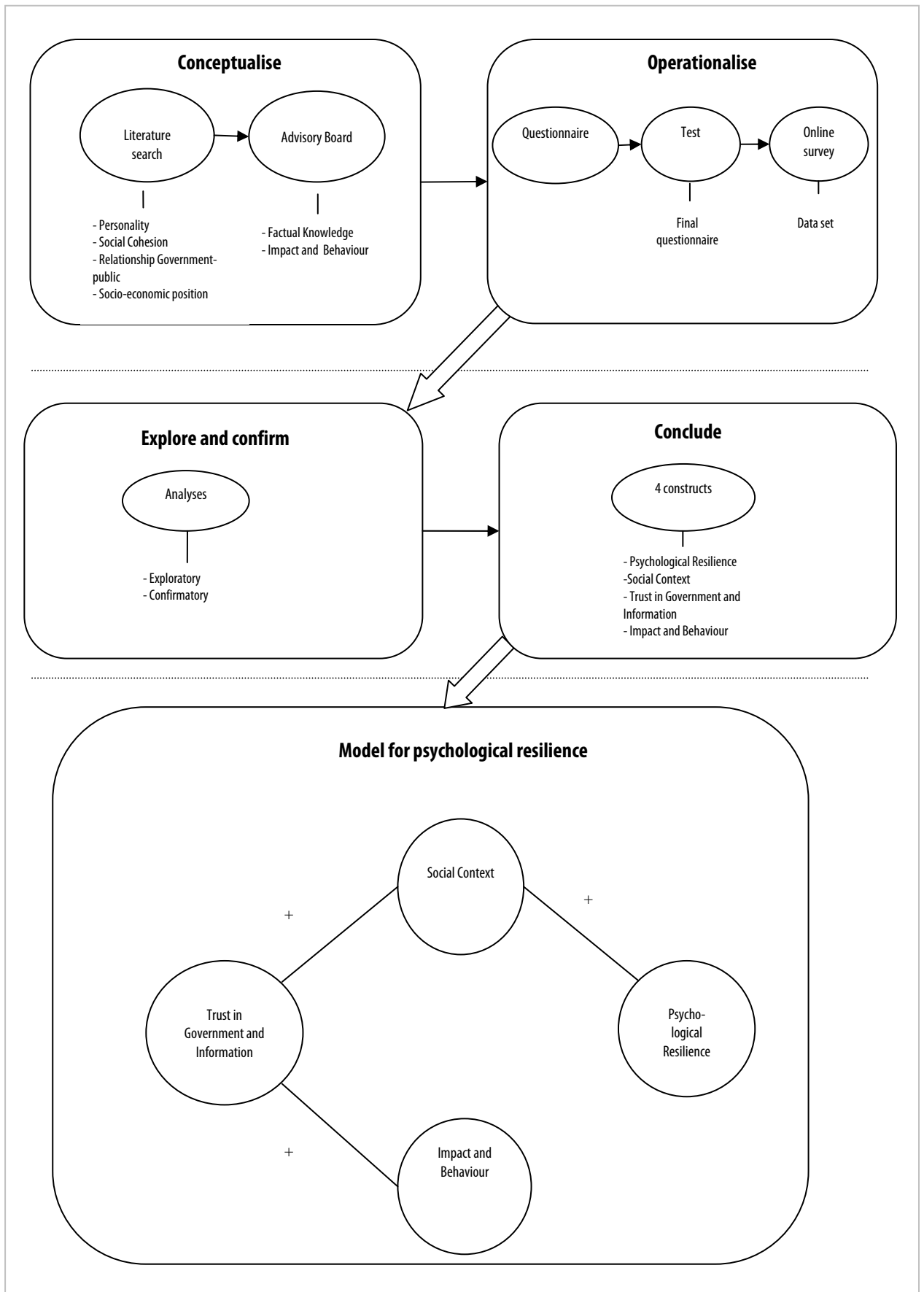
- Most trust is put in classic sources of information (newspapers, radio and TV). In contrast, social media appears to be less valued. This should be taken into account when choosing means of communication. It could affect the effectiveness of the communication;
- Although Dutch people trust the capacity of the government to prevent or control a disaster, most trust is given to auxiliary services such as the fire department, ambulance and police. This is possibly due to the visibility of these organisations after calamities;
- The trust of the public in information and (crisis control) capacities appears to affect psychological resilience. However, effects are mediated by Social Context. When endeavouring to enhance resilience by increasing trust it is important to take the social environment into account;
- The results indicate that the effects of changes in Impact and Behaviour on psychological resilience are mediated by Trust in Government and Information as well as Social Context. This implies that policies aimed at changing behaviour only, will have little influence on resilience. Further research into this correlation and into ways of influencing actual Impact and Behaviour is required.

Recommendations

Based on the results of the present research the following recommendations are formulated: (§6.6)

- Additional, longitudinal research is required to verify the established correlations. Furthermore, longitudinal research provides the opportunity of establishing the degree of influence of societal processes and events;
- As indicated above, the present research is based on self-reports of Dutch people. Additional research is necessary to examine the degree to which assessments of resilience are predictors of self-reliance and of actual behaviour after a disaster;
- Additional research needs to be done on the optimal provision of information after disasters based on the construct Trust and Information. (Which means of communication are optimal and does the use of social networks for the distribution of information lead to an increase in psychological resilience?)
- Additional research should be done on psychosocial resilience in different groups of populations to locate possible high-risk groups and aspects that cause significant differences between groups;
- For the first time, a measuring tool for psychosocial resilience has been developed. This offers the opportunity to connect resilience to other fields of research within physical safety and crisis control: the scenarios of the National Risk assessment, (social-) geographical location, economic and/or political developments. In this way, a complete overview of the (social) vulnerability of the Dutch population can be produced.

3. Overview Development Measuring tool and Model for Psychosocial Resilience



1. Introduction

The Government is becoming less dominant [...] In the coming years we want to focus more on the resilience of society instead of 'creating and solving' our own problems. We want to address the problem solving ability of society: letting go and expressing trust. Starting with everyone taking his or her own responsibility. Let's be strong together.

Management agreement 2010-2014 Resilience and Connecting,
Municipality Apeldoorn

In the Netherlands we are struggling with the concept resilience. What is it exactly? [...] We see it as a general characteristic of a society that is tenable, because of, for example, resources, strong social bonds, well-organised and professional welfare service, systems that work. But it is also a social objective in itself to create a resilient society [...]. What is more, it would be exceptionally useful if we, as society, could discover which factors contribute to making a group of people or citizens resilient.

Ministry of Interior and Kingdom Relations,
Programme Threats and Capacities, 2009

The words above illustrate that in the past years 'resilience' has received quite some attention from the Dutch government; there is need for a shared responsibility for society, in which government and citizens both take part.

Also in the (international) sciences the interest for this subject is increasing. Worries about climate change and geopolitical developments have contributed to the current search for ways to influence and enhance psychosocial resilience of citizens; in order to achieve societies that are resilient in the face of threats, whether these are of natural, technological or human origin.

1.1 Background

Due to the growing unrest about terrorism in the first years after the turn of the century, in 2005 the University of Ghent in Flanders conducted a similar research. (Measeele *et al.*, 2008). For this research, 1050 Flemish were questioned about their resilience and relating factors. The present research has partly been based on the results of this project.

At this moment there is no validated tool in the Netherlands that measures *psychosocial* resilience. This concept does not only concern the individual's characteristics, but it also relates to their relationship with their (social) environment. In case of disasters and shocking events, the government, as a keeper of public security and public order, plays an important role in facilitating the resilience of citizens.

In order to bridge this gap, in 2009 Impact has started the project 'Resilience Monitor' under the auspices of the Ministry of Interior and Kingdom Relations¹. An attempt has been made to develop a measuring tool that demonstrates which factors – in a disaster context specifically – correlate with psychosocial resilience.

1.2 Research set-up

Objective

The objective of the Resilience Monitor is to develop a measuring tool that can repeatedly be used to register the degree to which the Dutch community could overcome a shock/disaster. This measuring

¹ The Directorate Safety has been included in the Ministry of Security and Justice

tool is meant to determine the factors that correlate with resilience in the Dutch context and how they are interrelated.

To realise this objective, the following central question is formulated:

Which factors are related to the degree to which the individual Dutch person is capable of coping with a shock/disaster?

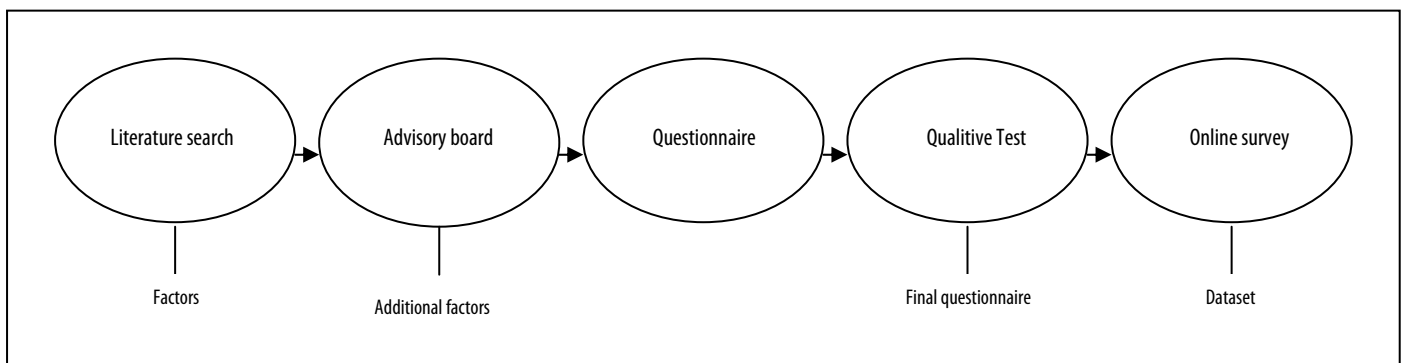
As a guideline for the development of the Dutch measuring tool a number of sub questions were formulated:

- 1) Which factors can influence resilience?
- 2) How can these factors be measured?
- 3) What is the current condition of resilience amongst the Dutch population?
- 4) Which factors play an important role in the Dutch situation?
- 5) Can these factors be influenced by the government?

Plan of action

First of all, a literature search was conducted to examine which factors should be included. In addition, an advisory board was formed to support the research process. This group consists of experts of the scientific field and the policymaking area, working with resilience, or related fields of research. The mix of members ensures that the tool is constructed scientifically and serves a practical value at the same time. In discussion with the advisory board it was decided which additional factors had to be included in the questionnaire in order to support the Dutch situation. Furthermore, a usability test was conducted amongst potential respondents in co-operation with the research bureau MarketResponse. Based on these results a final questionnaire was made, which MarketResponse then administered amongst an Internet panel. The steps taken in order to conduct the research are displayed in illustration 1.2.1.

Illustration 1.2.1 Process steps taken during the research



1.3 Reading guide

The report is largely based on illustration 1.2.1. In chapter 2 the conceptual framework will be explained based on the literature search. Accordingly, factors associated with psychosocial resilience that were frequently mentioned in the literature are discussed. The specific context of the disaster and the individual as well as the community level is taken into consideration. Based on the results, a conceptual model with the most relevant factors is presented.

Consequently, based on the conceptual model a questionnaire was constructed. The factors are then made operational according to constructs consisting of different elements. Chapter 3 of this report describes this. In this chapter the methodology for further research is also discussed: why choose an online survey and which statistical analyses are used?

The analyses of the results are discussed in chapter 4. A description is given of whether the data validates the constructs as they are presented in chapter 3.

Based on the Structural Equation Modelling (SEM), chapter 5 consequently presents whether and how the constructs form a model for psychosocial resilience. Accordingly, it becomes clear whether they correlate.

Lastly, chapter 6 presents a conclusion of the results of this research and the usability of the final model and measuring tool. In relation to this, it is important to know to which extent this tool can be implemented to measure psychosocial resilience amongst the Dutch. Additionally, recommendations will be made for further research.

2. Literature search

2.1 Introduction

As explained in chapter 1, the Resilience Monitor project focuses on psychosocial resilience after a disaster. In this chapter the conceptual framework in which the research has been conducted is described. It formed the basis around which the questionnaire and the data analysis were structured. In annex 3 the methodology behind the literature search is described. In this chapter, 2.2 will give an explanation of the concept of psychosocial resilience and will explore several definitions. Consequently, 2.3 will specifically focus on factors that are frequently used in research on psychosocial resilience. By means of these factors and the assumed connections between them as described in the literature, 2.4 presents the conceptual model. This will form the foundation of the hypotheses that will be tested in chapter 5.

2.2 What is psychosocial resilience?

Already in the 70's and 80's psychosocial resilience became a subject of interest. During this period, research focused on children growing up in adverse circumstances, but who were able to function properly as adults (Earvolino-Ramirez, 2007; Masten, 2007). Due to climate change and geopolitical developments, in the past two decades, the focus of research on psychosocial resilience switched to ways in which individuals and social systems can absorb shocks and can adapt to new situations. In this context, the main question is whether and how resilience can be stimulated or enhanced (Connor *et al.*, 2003, Bonanno *et al.*, 2007; Butler *et al.*, 2009). This information is particularly valuable for governments. Resilient citizens would need less support, meaning that the government can implement its capacity and resources in other places.

But what is meant by psychosocial resilience? One of the questions that has led to discussion in the past years, is whether resilience is a characteristic or a process. If resilience is approached as a dispositional attribute this means that external processes have little or no direct influence on the manifestation of resilience, but is determined by positive personal traits such as perseverance, self-esteem and 'a positive view on life' (Block & Kremen, 1996; Luthar *et al.*, 2000; Wagnild, 2003).

In the process approach, character does play an important role, but as an attribute that can be employed alongside other factors that contribute to resilience. It is also essential that people can rely on a social network and are offered space to cope with trauma by cultural and institutional processes. Therefore, the key to resilience cannot only be found in someone's personality (Tusai & Dyer, 2004; Bonanno & Mancini, 2008; Clauss-Ehlers, 2008).

A single definition of resilience had not yet been determined. The literature search conducted by the Resilience Monitor has rendered 39 different definitions (for an overview see annex 4). What they have in common, is that a majority of the authors conceptualise resilience as 'bouncing back' after a shocking event. This indicates either that a person is able to return to a previous state, or is capable of creating a new balance within the new situation.

2.3 Factors that affect psychosocial resilience

Even though the term resilience is not clearly defined in literature, studies on the development of resilience generally use the same factors. The present paragraph explains this in further detail and differentiates between factors on an individual and community level and factors that are specifically related to a disaster context.

Factors on an individual level

A large part of the factors used in the study involves the personality of the individual. Examples of this are self-reliance, perseverance and determination. People who are self-reliant and trust their own

capabilities, will develop relatively little psychosocial complaints after a shocking event and maintain normal levels of functioning (Bonanno, 2004; Bonnano & Mancini, 2008). Maesele *et al.* (2008) have called these characteristics 'ego-resiliency'. People can possess this trait whether or not they have experienced a shocking event (Luthar *et al.*, 2000). Other examples of characteristics mentioned are hardiness and, as will become clear from the glossary, adaptability. Hardiness is an umbrella factor for the ability to find the meaning in life, the sense of being able to influence life and the outcome of events and the idea that positive and negative experiences can be useful (Bonnano, 2004).

Furthermore, the presence and functioning of a supportive social network is very important. This can, for instance, consist of family, friends, acquaintances, colleagues and/or neighbours and offers a safety net whenever the feeling emerges of being unable to cope with the consequences of a stressful situation. It creates the idea that one does not have to deal with life alone, which positively affects psychosocial functioning (Fukuyama, 2001; Maesele, 2008; Butles *et al.*, 2009).

In several international and Dutch resilience scales that have been developed and tested, personal traits and social functioning of an individual are central (Wagnild & Young, 1993; Connor & Davidson, 2003; Potkzy, 2008). Thus, the focus of these scales lies primarily upon the psychosocial aspect of resilience.

Socio-economic characteristics such as gender, age, income, education, household composition and ethnicity are also related to the degree in which people can overcome a shock. In this context it is stated that the most vulnerable people are mothers with small children who belong to an ethnic minority and have had lower education (Norris & Elrod, 2006). Even though the results of various studies on the relationship between gender, age, income and education with resilience correspond (see for example Bonnano *et al.*, 2007; Butler *et al.*, 2009; Norris & Elrod, 2006), the influence of ethnicity is still ambiguous. It is generally assumed that being of an ethnic minority has a negative influence on resilience (Tobin, 1999), but several studies demonstrate that there is no effect or that there could even be a positive effect (Seplaki *et al.*, 2006; Claus-Ehlers, 2008; Bonnano & Mancini, 2008).

The role of religion or spirituality in psychosocial resilience is also a subject of scrutiny. Spirituality is defined as '*...a belief in a power apart from one's own existence and implies a connection with a universal force transcending everyday sense-bound reality [...] the search for purpose and meaning*' (Connor *et al.*, 2003, pp. 487). Because of their unpredictable and random nature, disasters and shocking events can have a great impact on people's lives, which is difficult to cope with. Religion and spirituality can offer people a sense of control, because it explains the why and how of an event (Walsh, 2007; Greeff & Loubser, 2008). Like ethnicity, the effect of spirituality on resilience is not clear (Fischer & Ai, 2005; Connor *et al.*, 2003).

Factors on community level

A large part of the existing resilience scales focuses on the individual. In the literature, however, attention is also paid to the influence of groups or communities on an individual. Communities are framed geographical areas where people have a connection with each other and their surroundings. In these areas, the interaction between people functions as the social capital. Fukuyama (2001, pp. 7) defines the social capital as '*an instantiated informal norm that promotes co-operation between two or more individuals*'. It can offer aid and support to someone going through a rough period. Social capital can be divided into two categories on a community level: social support and community ties (Norris *et al.*, 2008). The importance of social support has been briefly discussed above.

Community ties contain the relationships that the inhabitants of a community have with each other and with the geographical area itself. These can be divided into (i) sense of community: to which extent do inhabitants feel connected to their neighbours and rely on each other, (ii) attachment to a place: to which extent do people have an emotional attachment to a geographical place and (iii) citizen participation: to which extent do citizens participate in activities that are being organised (Norris & Stevens, 2007; Norris *et al.*, 2008).

The more close-knit a community and the stronger the attachment to a place, the more a group or individual is likely to be resilient (Kimweli & Stilwel, 2002; Norris & Stevens, 2007). Communities that are highly cohesive will probably take collective action during and after a disaster or shocking event,

which is expected to benefit the individual citizen (Adger *et al.*, 2005; Folke, 2006; Ahmed *et al.*, 2004). In some cases these connections can also have a negative effect, for example when people refuse to be evacuated or are unable to adapt to their new home when relocated (Paton *et al.*, 2001; Kimweli & Stilwel, 2002; Norris *et al.*, 2008).

Factors concerning disasters and shocking events

Resilience can manifest itself at several shocking events, such as the death of a loved one, being exposed to a crime or a divorce. However, in the present study the focus specifically lies on the disaster context. Because a disaster is such a large-scale event, additional factors will play a role in the manifestation of resilience.

The nature and size of the disaster or shocking event have to be taken into account. Comparative research done by Norris *et al.* (2002) demonstrates that a natural disaster is relatively easier to cope with than a terrorist attack. Additionally, it is important to consider the degree of exposure to a disaster, because the more exposure, the more likely someone is to develop psychological complaints such as Post-traumatic Stress Syndrome or depression (MacFarlane & Norris, Bonnano *et al.*, 2006; Ursano *et al.*, 2008). In relation to this, indirect exposure through media also plays a role (Fischer & Ai, 2008; Butler *et al.*, 2009).

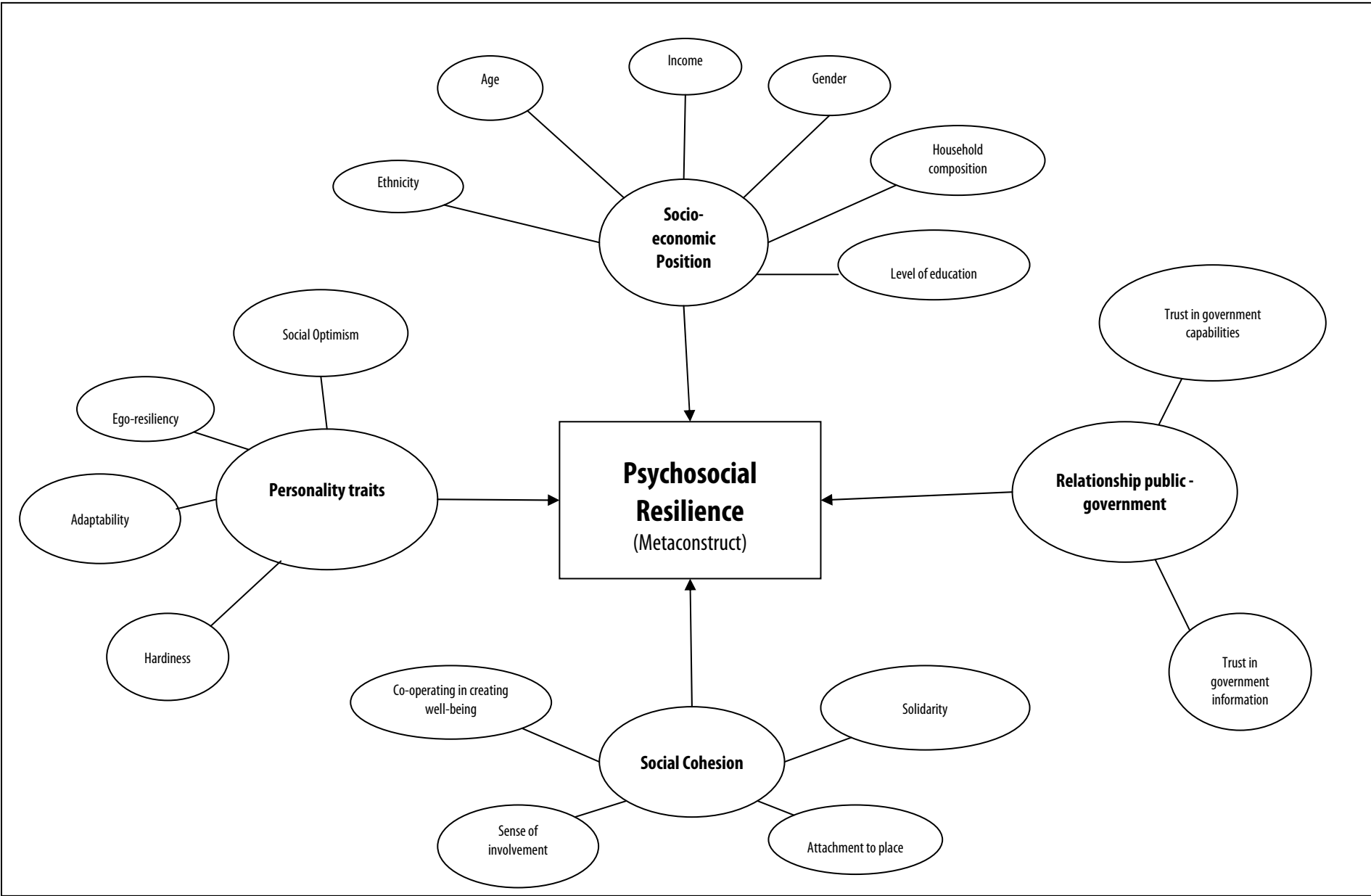
The government takes a prominent position during disasters by keeping the public order and public safety. Essential for resilience is the mutual relationship of trust between government and citizen. The lower the level of trust in the capacities and the information provided by the government, the more one tends to rely on other sources such as the media, friends and family. This can negatively affect the physical and psychological health of citizens (Archetti & Taylor, 2004; Lemrye *et al.*, 2005; Maesele *et al.*, 2008).

In order to create trust it is essential that the government communicate with the public before, during and after a disaster. Information has to be quick, factual, clear and not contradictory. Moreover, it is important to indicate which information is public and which is not and that no false reassuring statements are made (Heldring, 2004; Rogers *et al.*, 2007).

2.4 Conceptual framework

In the previous sections it has been demonstrated which factors in the literature contribute to psychosocial resilience. These are graphically displayed in illustration 2.4.1. Based on the literature it is hypothesised that 4 components influence psychosocial resilience in a disaster context: (i) personal traits, (ii) socio-economic position; (iii) social cohesion and (iv) relationship between public and government. The following chapters will discuss the extent to which the data indeed support the existence of a meta-construct psychosocial resilience and a possible connection between each of the components.

Illustration 2.4.1 Overview Conceptual model



3. Questionnaire Resilience Monitor: construction and set-up

3.1 Introduction

This chapter discusses various different methods used when conducting this research. In 3.2 the structure and the function of the advisory board will be highlighted. Subsequently, the operationalisation of various (expected) components of psychosocial resilience are described in 3.3. Paragraphs 3.4 and 3.5 deal with the usability test and administering the sample survey, respectively. Finally, 3.6 will explain the methods used for chapter 4 and 5. In this context, exploratory as well as confirmatory methods will be investigated.

3.2 Advisory board

From the start, the objective of this study has been to create an academically acknowledged measuring tool that also serves a practical goal. Therefore the choice was made to have the research guided by an advisory board including members from the scientific- as well as the policy area, who work with resilience or related subjects. The mix of members should ensure that the tool is constructed according to scientific- and practical values. The structure of the advisory board is represented in table 3.2.1.

Table 3.2.1 The structure of the advisory board

Name	Function
Prof.dr. I. Helsloot	Chairman; Professor of Physical Safety and Crisismanagement, VU University Amsterdam
Prof.dr. R. Kleber	Vice-chairman; Professor of Psychotraumatology, University of Utrecht
Prof.dr. H. Van Gunsteren	Emeritus Professor of Political Theories and Philosophy of Law, University of Leiden
Mrs. M. Ostendorf	Senior communication advisor, National Crisis Centre
M Sc. M. Rooze, MBA	Director Impact Foundation
M Sc. M. Van Tuyll	Deputy programme manager Threats and Capacities (V&J)
Prof.dr. G. Verleye	Professor Scientific Communication Research, University of Ghent

The advisory board has held three meetings during the execution of the project. During these meetings the progress, difficulties and possible solutions were discussed. The instances where the advisory board has made specific comments on the questionnaire are mentioned in 3.3 and 3.4.

3.3 Operationalisation of the conceptual model

The conceptual model displayed in chapter 2 illustrates four central factors, which in the literature were often associated with resilience. Each of these central factors is operationalised for the questionnaire. In this process, if possible, existing, validated questionnaires were used.

Personal traits

In the conceptual model the construct 'Personality traits' consists of four factors: ego-resiliency, hardiness, social optimism and adaptability. These are the factors that are most recurrent in the literature. To make these operational, a tool that has been validated and tested in the Netherlands was selected: the *RS-nl*. The abbreviation stands for Resilience Scale – Dutch version and is a translation of the 25-item scale of Wagnild & Young (Portzky, 2008). Five factors are used:

1. *Equanimity*: having a balanced perspective of one's life and not focusing on the negative;
2. *Perseverance*: being able to practice perseverance, self-discipline and involvement despite adversity;
3. *Self-reliance*: a belief in one's capabilities and a realistic view on one's own limitations;
4. *Meaningfulness*: the conviction that life has a meaning and the feeling that there are enough reasons that make life worth living;

5. *Existential Aloneness*: the realisation that each person's life path is unique and that even though some events have to be experienced alone, some experiences can be shared with others. It also implies that people should take their own responsibility for achieving things in life.

The factors included in the conceptual model show great resemblances to the five above-mentioned factors. 'Self-reliance' and 'Perseverance' resemble 'Ego-resiliency', while 'Meaningfulness' and 'Existential Aloneness' show an overlap with 'Hardiness'. Also 'Equanimity' shows, in relation to having a calm, relaxed approach and not reacting extremely in unexpected events, similarities with 'Adaptability' from the conceptual model. Therefore, three out of four factors within the construct 'Personality' from the conceptual model can be operationalised through the *RS-nl*.

RS-nl

Apart from the overlap between the factors from the *RS-nl* and those identified in the literature search, there are two other reasons why this questionnaire was used. Firstly, this is the only international questionnaire aimed at psychological resilience that the researchers know of, which has been translated and validated for the Dutch situation. Furthermore, research has shown that at this moment the Resilience Scale is the best tool to measure resilience. Among other things, because it is applicable to a diversity of research populations (Ahern *et al.*, 2006).

The results of the conducted sample survey will be discussed in 4.2.2. We have chosen to divert from the *RS-nl* on one aspect. Portzky (2008) has used a four-point scale, while the present study uses a five-point Likert scale. This makes it more difficult to compare results between the different studies. This choice is based on several important reasons.

First of all, the original research by Wagnild & Young (1993), of which the *RS-nl* is a translation, is based on a 25-item questionnaire with a seven-point scale. Portzky (2008) has reduced this to a four-point scale. The reason for this is, that according to them, the use of a seven-point scale leads to extreme answers more often and can cause artificially large standard deviations. However, the switch to a four-point scale eliminates the possibility for respondents to answer neutrally. Moreover, comparing results based on an odd and even response scale is very difficult, because the data has to be converted.

For this research, we have chosen to rely upon the original study of Wagnild & Young (1993) and to use an odd response scale. All the more, because the English Resilience Scale has not only been translated into Dutch but also into several other languages, for which studies have followed the original seven-point scale (Heileman *et al.*, 2003; Lundman *et al.*, 2007). A five-point scale has been used because we agree with Portzky that a seven-point scale leads to an extreme response style and large standard deviations. By choosing an odd response scale, results can be compared with the above-mentioned studies.

Furthermore, the Resilience Monitor consists of five parts, for each of which a five-point scale is applied. The comprehensiveness and transparency of the questionnaire for the respondents was another reason to also follow the five-point scale for the Psychological Resilience part consisting of the *RS-nl*.

In the validated Dutch translation of the RS-scale (Portzky, 2008) several alterations were applied to the original English RS-scale. These alterations were incorporated in the present research. For item (3) I am able to depend on myself more than anyone else, additional changes were applied, as the usability test indicated that respondents still had difficulties understanding and answering this question. It was therefore changed for the present research into: I am able to depend on myself more than I expect others to be able to depend on themselves. For more details on the usability test see § 3.4.

Social Optimism

A factor that cannot be made operational through the *RS-nl* is 'Social Optimism'. This can be explained by the fact that Wagnild & Young (1993) have developed the idea that resilience is a character trait that is only partly pliable and impressionable. In this respect resilience is predominantly

innate, so that the quality of social contacts only plays a minor role. The literature consulted, demonstrates a great degree of consensus on the approach to resilience as a dynamic process, in which the environment is greatly influential. Therefore it was decided to include 'Social Optimism' in the model. It was made operational by using the *Positive Outcome List*, developed by Appelo and validated in the Netherlands.

The *Positive Outcome List* (*Positieve Uitkomsten Lijst, PUL*) has been developed by Appelo (2005). The aim of this questionnaire is to measure psychological capacity by means of positively formulated items. It is based on the thought that psychotherapy should focus less on complaint reduction and more on positive aspects. In the *PUL* an important aspect is highlighted that is not explored in the *RS-nl*: the perception of social contacts and one's social functioning. Social relationships can function as a safety net when problems exceed the capacity of the individual. The safety net can have a practical function, for example by offering resources. But this function can be psychological as well, having someone to comfort you and having the sense of support (Caplan, 1990; Fukuyama, 2001; Butler *et al.*, 2009). The sub-scale 'Social Optimism' from the *PUL* focuses on the quality as well as the quantity of social contacts from the perspective of an individual.

The sub-scale consists of the items (1) I can count on others, (2) I function well in social contacts and (3) I am satisfied with the number of social contacts that I have.

The sub-scale *Social Optimism* was originally a four-point scale. For this research a five-point scale has been used. Accordingly, the same reasoning was followed which was previously described for the *RS-nl*.

Social Cohesion

Based on the literature three factors are presented under the main construct 'Social Cohesion', namely 'Sense of community', 'Attachment to place' and 'Citizen participation'. For the operationalisation of the main construct it has been decided to use an existing measuring tool that has been validated in the Netherlands: *Community Involvement* (Frieling, 2008). This tool, developed by the University of Groningen under the auspices of the Ministry of Health, Welfare and Sport, divides social cohesion into three components:

1. *Co-operating in creating welfare*: the degree to which individuals undertake things together with their neighbours or talk to their neighbours;
2. *Solidarity*: the degree to which neighbours support each other;
3. *Sense of involvement*: the degree to which individuals feel they are involved with their neighbours.

A clear overlap can be observed between the three above-mentioned factors of the *Community Involvement* tool and the factors 'Sense of community' and 'Citizen participation' as described in chapter 2.

Community Involvement

Frieling (2008) identifies three separate aspects of social cohesion: co-operating in creating welfare, solidarity and sense of involvement. These are divided into seven items, which successively measure increasingly intense forms of social cohesion.

The component 'Co-operating in creating Welfare' includes actions on the individual level as well as on the community level. On the *Community Involvement* scale, this is represented by the items: (1) How often did you talk to someone in your neighbourhood in the past half year?; (6) Are there any parties or other activities in this neighbourhood to which a number of people are invited? If so, how often do you go to these parties or activities? And (7) How often have you co-operated with others from your neighbourhood to organise something, for example a party?

The component Solidarity is measured by the items: (2) If you are away from home for a longer period of time, is there someone in the neighbourhood who keeps an eye on your house, for example by checking whether your house is not broken into, by taking care of your pets or watering the plants?; (3) When something important happens in your neighbourhood, at work or to your family or friends, is

there someone in the neighbourhood who would share this with you? and (5) When there is a sad moment or a sad event in your life, is there someone in your neighbourhood whom you turn to and can rely on?

The component Sense of Involvement is represented by 1 item: (4) Do you feel involved with the people in your neighbourhood?

The Community Involvement scale has also been adapted according to the aims of this research. On recommendation of the advisory board, the questions have been adapted so they do not only involve the neighbourhood, but the complete social environment. This includes the neighbourhood, but also family/friends and a possible working environment. This has been done because exposure to disasters is not limited to the home situation and people do not only rely on people from their direct living environment for recovery. Therefore relationships outside the neighbourhood become important. The word 'neighbourhood' has therefore been changed to 'environment'. For every question, the following brief explanation is provided to make clear what is meant by environment:

By environment we mean family, acquaintances, colleagues and neighbours.

Two items from the *Community Involvement* scale have been adapted for the present research. This concerns items (6) Are there any parties or other activities in this neighbourhood to which a number of people are invited? [IF SO] How often do you go to these parties or activities? and (7) In the past year, have you worked together with neighbours to organise something in the neighbourhood, for example a neighbourhood party or –activity or to make a local newsletter? [IF SO] How often did you meet with these neighbours in the past year?

Item (6) has been divided into two parts. Respondents who indicate that there are no parties being organised for a great amount of people, will not be asked how often they go to these parties, because this question is irrelevant to them.

The two questions of item (7), however, were merged. The original answering categories made it possible to directly ask respondents how often they have co-operated in the past year.

Attachment to place

In adopting the 'Community Involvement' scale only the factor 'attachment to place' from the conceptual model has not yet been operationalised. The literature shows that attachment to place can have additional value to psychosocial resilience. Not only for the individual, but for the entire community. People will be more likely to rebuild their neighbourhood if they feel attached to it (Paton *et al.*, 2001; Kimweli & Stilwell, 2002; Norris *et al.*, 2008).

As far as the researchers are aware, a validated measuring tool for 'Attachment to Place' does not exist. That is why the option has been chosen to apply two statements that are also included in two English social cohesion tools (Bruckner, 1988; Norris *et al.*, 2008; Coffman & BeLeu, 2009). (1) I feel attached to the neighbourhood in which I live, and (2) I would certainly like to continue living in this neighbourhood for a few more years.

Relationship with the government

The relationship between citizens and the government can be essential during or after a disaster when psychosocial resilience comes into play. In the literature, the focus of this relationship lies on the communication of information by the government to citizens. In the case of disasters, the government has to be quick, factual and clear. This gives people the opportunity to respond in a way that secures their safety and well-being (Heldring, 2004; Rogers *et al.*, 2007).

The operationalisation of this part predominantly relies on the research of the University of Ghent in 2005 (Maesele *et al.*, 2008) and the advisory board. The aspects completeness, reliability and comprehensiveness of information have been selected to play a central role. Additionally, a distinction has been made between national and local governments, because local sources of information may be considered more reliable (Norris & Stevens, 2007). Finally, upon recommendation of the advisory board, respondents were also asked about their degree of satisfaction concerning the swiftness of information provision by the government.

Secondly, the community should trust the capacities of the government. This will be inquired after by asking questions aimed at the degree to which citizens think that the government(al services) are prepared for a disaster and also the degree to which they think that the government(al services) are able to cope with the consequences of a disaster. This way, the course of study of Maesele *et al.* (2008) is followed. Various adaptations were made based on the suggestions of the advisory board. In the Belgian study, questions were asked regarding local, provincial, national and international governments/services/organisations. According to the advisory board, in the Dutch context the province is not that influential. Moreover, at this moment, it is much more interesting for the government to know how much trust people have in the Dutch services and governments. For this reason, the provincial and international contexts have been excluded.

Socio-economic Position

Chapter 2 has demonstrated that the literature often links various socio-economic factors with psychosocial resilience. The questionnaire considers gender, age, education, income, religion and household composition. The response categories for income are based on structures used by the Central Bureau for Statistics.

In discussion with the advisory board it has been decided to ask the question regarding religion as directly as possible: 'Are you religious?' By providing yes/no/I do not know response categories, it is expected that the respondent will be better able to make a choice that applies to his/her situation, than when a specific religion is referred to.

By using the Internet panel of MarketResponse, the remaining traits did not have to be inquired after. These were already known by MarketResponse. Categories are arranged according to MOA-data. A further explanation about this will be provided in paragraph 4.1.3.

Additional constructs

From the literature search described in chapter 2, four categories of factors emerged: Personality traits; Social Cohesion; Relationship with the government; and Socio-economic Position. In the introduction, it has already been pointed out that the present study is largely based on research conducted by the University of Ghent in 2005 and that deliberation with the advisory board plays an important role in the final set-up of the questionnaire. This resulted in two additional categories of factors to be investigated: *Impact and Behaviour* and *Factual Knowledge*. These will be discussed in the following paragraph.

Impact and Behaviour

To be able to handle a crisis or disaster adequately, governments are partly dependent on the way in which the population will behave; for example, whether citizens are prepared to evacuate, risk of social unrest, will groups of the population be opposed, will citizens follow advice offered by the government?

The scenarios focus on the way respondents think they will behave in the case of a disaster. They are specifically aimed at avoidance behaviour, taking advice given by the government and searching for as much information as possible. Avoidance behaviour indicates whether people will adjust their geographical and/or social behaviour after a disaster and whether that will guide them. This can result in shifts in a community such as stigmatism of certain groups of people (Lemeyre *et al.*, 2005; MacFarlane & Norris, 2006). Research done by Maesele *et al.* (2008) points out that searching for as much information as possible from sources other than the government, causes people to run a higher risk of developing psychosocial complaints after a disaster.

In total three scenarios were described, which illustrated three different kinds of disasters: natural cause, caused by people intentionally and unintentionally. This division was applied, because literature shows that the kind of disaster influences the degree of psychosocial complaints experienced by people. People who have been exposed to an event that concerned large-scale violence are more likely to develop complaints than people who have experienced a natural disaster. Furthermore, behaviour and impact appear to vary according to the kind of disaster (Norris *et al.*, 2002).

The scenarios have been written by the researchers and have been presented to the advisory board. Originally, the third scenario involved a train collision. The advisory board, however, indicated that the majority of the people commute by car and would not identify with a train accident. Accordingly the third scenario has been rewritten to describe a bridge collapse.

This scenario also deviates from the flu- and terrorist attack scenario as it does not include a question about acting upon governmental advice. This has not been formulated because it could only concern advice not to avoid certain roads, tunnels, viaducts and bridges. Such advice shows quite some overlap with the first statement where a question about avoidance behaviour is already asked.

In the questionnaire, it has been explicitly stated that the person in question and his or her family and friends remain unharmed. This creates a distant situation. In this way, personal feelings regarding an injury or death of a loved one do not present an additional complexity.

Factual Knowledge

Respondents' factual knowledge about disasters is tested by means of multiple-choice questions. Similar research from Flanders, Belgium in 2005 demonstrated that the more factual knowledge people have, the more resilience they will show (Maesele *et al.*, 2008).

An attempt has been made to formulate questions concerning many different kinds of disasters to test knowledge as complete as possible. Therefore, for each kind of disaster seven questions were asked: natural disasters, technological disasters and intentional human-caused disasters. Questions were asked about figures (dates, number of victims), but also about the circumstances of the disaster (the place where it happened). Finally, questions were also asked that concerned more general knowledge. Both national and international disasters were included.

A couple of questions have been adopted from the Belgian study, which was specifically aimed at factual knowledge about terrorism. The other questions have been formulated by the researchers. These have been presented to and approved by the advisory board.

3.4 Usability test

On Wednesday 26 May 2010, in co-operation with MarketResponse Netherlands Ltd. a qualitative usability test of the questionnaire was administered. The aim of the test was to analyse whether the questionnaire was user-friendly for potential respondents: are the questions formulated clearly, do people understand what is being asked, do the response categories make sense? Furthermore, through this kind of qualitative testing it is possible to examine what people think of the questionnaire: is the subject relevant, was the questionnaire (too) lengthy or (too) short, how did people feel while filling out the questionnaire? Finally, by means of the usability test it can be estimated to which degree people give socially acceptable answers.

For the usability test, in 30 minutes eight respondents have separately, but together with an employee from MarketResponse, filled out the questionnaire. Respondents were selected from an (Internet)panel of MarketResponse, named The Research Group (*De Onderzoek Groep*). An explanation regarding the composition of this panel and the implications hereof will follow in 3.6. An attempt has been made to create a mixed combination of respondents, similar to the final sample survey. For this reason, during the selection attention was paid to age, gender, education and income.

Some interesting results emerged from the usability test. Firstly, it demonstrated that the respondents were positive about the user-friendliness of the questionnaire. The language was clear and they understood what was being asked. For some questions a clear instruction was missing to prevent possible misunderstandings, or a response category. It concerned the following questions:

- Regarding the Community Involvement scale. An instruction was added here to explain what is meant by 'environment'. Moreover, the response categories 'almost never' and 'most of the time' have been adapted to 'never' and 'always', because respondents did not see a clear difference from 'mostly not' and 'mostly'.

- Regarding information. Here respondents indicated that they missed the response category 'I do not know'.

These adaptations were processed in the final questionnaire. Also regarding the *RS-nl* questions, the respondents preferred the 'I do not know'-category. However, it was decided to stay as close as possible to the original questionnaire and to force respondents to make a choice regarding these questions.

Secondly, filling out the questionnaire takes a long time. In particular, the part concerning 4.5 Trust in Government and Information, was considered less appealing and long-winded. The composition of the questionnaire (questions about self – social context – information provision – scenarios – factual knowledge) was regarded positively, because the scenarios appeal to the imagination and motivate to finish the questionnaire.

Most respondents found the subject of the questionnaire interesting. It is different from normal studies in which people were asked to participate. It was regarded as topical and important to gain insight into this subject.

Finally, it was found that the respondents answered the various questions openly and honestly. In their response people often used their own personal experiences. Based on the usability test it is therefore not expected that people will give socially accepted answers.

3.5 Internet survey

Administering an online survey has several advantages. Compared to a written survey it is a relatively time- and cost extensive method through which large groups of people can be reached (Wright, 2005). Furthermore, surveys administered online are less susceptible to missing values. These emerge when respondents do not answer all the questions from a questionnaire. However, a computer screen can present respondents with the message that they have not answered the question and cannot continue (Stanton, 1998; Zuidgeest *et al.*, 2008). Additionally, using online data collection is becoming increasingly common (Granello & Wheaton, 2004).

A disadvantage of online data gathering is that the response rate is often lower than it is for written or dually² administered surveys (Sax *et al.*, 2003). Furthermore, it is doubted by some whether online surveys capture a representative sample, because not everyone has access to Internet. Certain groups of the population (in particular people with a lower educational level and a lower income) will therefore be underrepresented in the sample (Zuidgeest *et al.*, 2008). Data from the Central Bureau for Statistics (CBS) shows that in 2010, 94 percent of the Dutch had access to Internet (CBS, 2010). In addition, it is expected that these problems will be reduced by using a research bureau with a fixed (Internet) panel, whose members regularly participate in research and the fact that certain conditions apply to the selection of panel members.

In June 2010, in co-operation with MarketResponse, the questionnaire was administered anonymously among a sample of the (Internet) panel of MarketResponse, called the Research Group. This panel consists of 50,000 individuals. To take part in this research panel, potential candidates have to be invited by MarketResponse. Acquiring members this way prevents so-called professional- and convenience respondents from joining the panel. These are respondents who enrol in many different panels, often using more than one e-mail address, in order to make money. These groups do not or to lesser extent fill out a questionnaire in a serious manner, causing the information provided by them to be of no real value. The quality of the Research Group panel is secured, because people are selected by invitation only (MarketResponse, 2010). In a comparative research of Internet panels undertaken by the Dutch Online Panel Comparative Research it was found that the Research Group has the least double memberships and also fulfilled all the quality requirements (NOPVO, 2010).

From the Research Group, a random sample was taken of 3727 people. These people were approached on the telephone to request their participation in the research. Of this sample, 3161 people were actually reached. Based on these telephone calls, 2134 respondents were prepared to

² For dually administered research respondents have the choice to partake in either a written or online survey.

participate in the research. Finally, 1361 complete questionnaires were received. This indicates a response rate percentage of 63.8 percent.

Subsequently, the data was processed in an SPSS-file by MarketResponse.

3.6 Methodology regarding chapter 4 and 5

In the chapters 4 and 5 several statistical tests are executed to examine whether the various components inquired after in the questionnaire indeed form a model for psychosocial resilience together. The background of these analyses is further explained here. First of all, exploratory methods of chapter 4 will be dealt with, after which the confirmatory methods (the structural equation modelling, SEM) of chapter 5 will be elaborated on. In confirmatory analyses, one explicitly searches for the theoretically formulated components, while in exploratory analyses no assumptions are made (Anderson & Gerbing, 1988).

Exploratory analyses

In chapter 4 different exploratory analyses have been applied. Analyses were generated by SPSS 18.0.

Reliability analysis

A reliability analysis is administered when exploring the extent to which certain (conceptual) constructs are supported by the data. Though not the only validation scale, the Cronbach's alpha is the most frequently applied (Cortina, 1993). Cronbach's alpha measures the internal concurrence of the items by calculating the mean correlation between all possible combinations of the used items. The correlation will generally increase in response to a higher outcome, which means that all items increasingly measure the same construct thus enhancing the validity of the scale that has to be formed (Bland & Altman, 1997; Santos, 1999).

Cronbach's alpha is measured on a scale of 0 to 1. A scale is generally accepted as reliable when the value for Cronbach's alpha is higher than 0.60. However, validity is generally only considered favourable for values of 0.70 or higher (Iacobucci & Duhachek, 2003).

Cortina (1993) advises when using Cronbach's alpha to also pay attention to inter-item correlation. That is to say, the alpha outcome is also influenced by the number of items used. When this number increases, the alpha value increases. By also considering inter-item correlations, it is confirmed that all items indeed measure the same underlying construct. For each item, inter-item correlation should have a minimal value of 0.70 (Cortina, 1993).

Principal Components Analysis

A Principal Components Analysis is a kind of factor analysis, which attempts to divide the data according to factors. In the case of the Principal Components Analysis, all factors are transformed according to the same variance and are represented according to size. In this context, the first component explains the highest amount of variance. Followed by the second component, which explains most of the remaining variance, etc. (Daultrey, 1976).

In the Principle Components Analysis different rotations can be used. The rotation maximises an equal spread of variances of the different factors over the components (Tinsley & Tinsley, 1987). Although Varimax rotation is generally used (Cureton & Mulaik, 1975), for the current study we chose the Promax rotation. This is an oblique rotation, for which, in contrast with an orthogonal rotation such as Varimax, the factors are allowed to correlate. This leads to a preference for Promax rotation in the social sciences (Costello & Osborne, 2005). Additionally, it is recommended to use an oblique rotation when correlations between factors are greater than 0.15 (De Vellis, 2003).

For this research a minimal loading of 0.40 is maintained in order to establish which factor an item belongs to. Even though the minimal loading a factor should have is open to discussion, 0.40 is considered as a standard (Costello & Osborne; Treiblmaier & Filzmoser, 2010).

Confirmatory analyses

In chapter 5 confirmatory analyses are generally applied with a specific focus on Structural Equation Modelling (SEM). The SEM analyses are generated in Amos 6.0. This will be explained in the following paragraphs.

Structural Equation Modelling (SEM)

SEM is a confirmatory method, which can be used to examine whether theoretically formulated constructs are supported by the data and how they relate or correlate. The expected model is tested based on hypotheses (Bielby & Hauser, 1977). Based on a first test, relationships that appeared to be non-significant have been removed from the model, after which a new test was administered. So-called fit measures determine which model is best supported by the data. In the present study the following fit measures were applied:

-NFI (Bentler-Bonnett Normed Fit Index):

Values for the NFI lie between 0 and 1. A value below 0.90 indicates that the model can be improved. Values between 0.90 and 0.95 are acceptable and values above 0.95 are favourable (Bentler & Bonnet, 1980).

- TLI (Tucker-Lewis Coefficient):

Values for the TLI lie between 0 and 1.0. Values close to 1.0 indicate an optimal fit (Bentler & Bonnet, 1980).

- RMSEA (Root Mean Square Error of Approximation):

RMSEA values lie between 0 and 1.0. In contrast to the above-mentioned fit measures, good models have a RMSEA value that is equal to or lower than 0.05. Values between 0.05 and 0.08 are considered acceptable. Values greater than 0.10 indicate a bad fit (Browne & Cudeck, 1993; Byrne, 2001).

The better the hypothetical model scores on different fit measures, the more the estimated model fits the data.

4. Description of measuring data

Based on chapter 2 and 3, six factors are distinguished which are expected to influence psychosocial resilience: psychological resilience, social cohesion, socio-economic position, relationship public-government, impact and behaviour, and factual knowledge. This chapter will further explore the first analyses that have been generated from the data set. The primary objective of these analyses is to investigate how Dutch people look at different factors: for example, their psychological resilience, their social network and the way they expect to respond to a disaster or crisis. Furthermore, it is explored whether questions included in different parts of the questionnaire can be combined in one scale. In this way, the creation of an optimal measuring tool can be achieved.

Before describing the results from the questionnaire and the analyses, 4.1 will further explore the response and the sample distribution. Furthermore, an answer is given to the question whether the present sample survey is representative for the Dutch population. Subsequently, 4.2 to 4.6 deal with one of the factors that influence psychosocial resilience. Finally, 4.7 summarises this chapter and discusses the most important conclusions.

4.1 Response and sample distribution

4.1.1 Introduction

In this chapter, 4.1.2 gives a description of the sample survey and the response. Subsequently, in 4.1.3 the socio-economic features of the respondents are explored and the extent to which they are representative for the Dutch population. The consequences for the possibility to generalise the sample results are discussed in 4.1.4.

4.1.2 Sample survey and response

In June 2010 the Resilience Monitor questionnaire was administered amongst the (Internet) panel of research bureau MarketResponse Netherlands Ltd. This panel, called the Research Group, consists of 50,000 individuals (MarketResponse, 2010). A sample of 3727 persons in the age of 16 or older was taken from this group. In a telephone conversation 2134 panel members expressed their willingness to participate in the research. Finally 1361 questionnaires were filled out, which means a response rate of 63.8 percent.

For a complete description of the methodology underlying the sample survey please refer to chapter 3.5.

4.1.3 Socio-economic characteristics of the respondents

Respondents were asked several questions relating to their socio-economic characteristics. The aim is to assess whether the sample survey is representative for the Dutch population.

The distribution found in the sample survey was compared to the Golden Standard. This is a calibration tool, developed by MOA – Center for Marketing Intelligence and Research, in co-operation with the Central Bureau for Statistics (CBS), used within the branch of (market) research bureaus. The Golden Standard ensures that all member bureaus³ use the same calibration data.

The more the sample survey correlates with the Golden standard, the more representative it is for the Dutch population (MAO, 2010).

³ Amongst which: MarketResponse Netherlands Ltd., TNS-NIPO Ltd., Synovate and Motivaction Ltd.

Factors that have been compared to the Golden Standard are: gender, age, education, family size, ethnicity, urbanity and region. For income and religion there was no Golden Standard-data available for the researchers, they have therefore been compared to the most recent figures of the CBS.

Table 4.1.1 demonstrates that for nearly all factors mentioned the sample distribution is chiefly comparable to the Golden Standard. Exceptions are education and ethnicity. In the first case, the sample contains a relatively large number of higher educated people, 52.6 percent of the respondents falls into that class. Compared to 33.92 percent of higher educated people in the Golden Standard. Furthermore, the sample would be representative if 80 percent of the respondents were Dutch. However, 97.7 percent of the respondents have indicated to have the Dutch nationality. Ethnicity was included in the sample in its broad sense. That is to say, each respondent was grouped as Dutch if he/she was born in the Netherlands. The country of birth of the parents was not included. For both cases the conclusion should be drawn that the sample was not representative.

Table 4.1.1 Distribution of the respondents in gender, age, education, family size, ethnicity, urbanity and Nielsen MOA, at which N=1361

Factor		Absolute	% Sample	Golden standard
Gender	Male	653	48	49.86
	Female	708	52	51.14
Age	18-24	149	10.1	15.4
	25-34	190	13.23	17.32
	35-44	306	21.82	21.88
	45-54	322	23.59	19.47
	55-64	247	18.74	15.49
	65 or older	147	12.49	10.44
Education*	HW	131	9.6	33.92**
	HB	447	32.9	
	HA	138	10.1	
	MB	394	28.9	44,45
	MA	140	10.3	
	LB	106	7.8	21,63
	LA		0.1	
Family size	1	204	15.0	17.06
	2	495	36.4	33.18
	3	249	18.3	17.89
	4	261	19.2	21.03
	5 or more	152	11.2	10.86
Ethnicity	Dutch	1316	96.7	80.7
	Non-Dutch	2	3.3	19.3

Continued on the next page

* Dutch levels of education ranging from HW representing the highest (university) to LA representing the lowest (primary education)

** The Golden Standard structures level of education according to a high, average and primary

Tabel 4.1.1 continued

Factor		Absolute	% Sample	Golden standard
Urbanity	Very urban	191	14.0	17.6
	Urban	400	29.4	29.0
	Moderately urban	271	19.9	18.7
	Slightly urban	322	23.7	22.0
	Not urban	177	13.0	12.7
Nielsen MOA	3 largest municipalities		11.4	14.63
	West		28.6	29.88
	North		10.7	10.46
	East		22.4	21.03
	South		26.8	24.00

For the factors income and religion the authors could not use values from the Golden Standard. To be able to compare these factors recent CBS-figures were included in table 4.1.2. Accordingly, it can be seen that the lower income classes were underrepresented in the sample. This is probably related to the fact that the lower educated were also underrepresented, which could already be concluded from table 4.1.1. Furthermore it was found that the distribution of people who regard themselves as religious or not do not correspond to the CBS statistics. These statistics, however, are derived from the period 2000-2003, so they are no longer current. In 2003 the CBS stopped publishing this information. Another research from 2006 demonstrates that 38 percent of the Dutch people do not consider themselves a 'religious person' (Dekker, 2007, pp. 52). Taking into account these figures from two separate sources it can be concluded that in the present sample survey, people who consider themselves non-religious are overrepresented.

Table 4.1.2 Distribution of respondents regarding income and religion

Factor		Absolute	% Sample	CBS
Income	No income	73	5.4	0.01
	Up to 10,000 euro	111	8.2	20.04
	10,000 – 20,000	174	12.8	21.99
	20,000 – 30,000	246	18.1	19.71
	30,000 – 40,000	290	21.3	15.50
	40,000 – 50,000	146	10.7	10.56
	Equal to, or more than 50,000 euro	150	11.0	10.46
	Do not know/ do not want to say	171	12.6	19.11
	Religious	Yes	458	33.7
	No	851	62.5	40.7
	Don't know	52	3.8	3.4

* data from 2008

** data from 2000-2003

4.1.4 Conclusion

From the results presented above it can be concluded that, on many of the socio-economic factors the sample survey can be considered representative for the Dutch population. Exceptions are education, income, religion and ethnicity.

4.2 Psychological resilience

4.2.1 Introduction

Psychological resilience focuses on the personal traits of an individual that enable him/her to overcome a disaster or a shocking event. These traits are predominantly innate and can only be influenced to a certain degree. Examples are self-reliance, self-discipline and perseverance (Wagnild, 2003).

In this chapter psychological resilience is further discussed based on the *RS-nl*, the Dutch translation of the original Resilience Scale by Wagnild and Young (Wagnild & Young 1993; Portzky, 2008). In 4.2.2 *RS-nl* is briefly described and the results of the present research regarding this part will be dealt with.

In 4.2.3 an exploratory components analysis is administered to examine whether the five theoretical components of psychological resilience as formulated by Wagnild & Young (1993) are validated by our data set.

4.2.4 draws some conclusions based on the results and clarifications presented in 4.2.2 and 4.2.3 and which effect they have on the continuation of this research.

4.2.2 RS-nl

About the RS-nl

The *RS-nl* is the English Resilience Scale developed by Wagnild & Young and has been validated for the Netherlands and Flanders (Wagnild & Young, 1993; Portzky, 2008). Both the original Resilience Scale and the *RS-nl* test the hypothesis that psychological resilience consists of five components, which are all connected to each other: Equanimity, Perseverance, Self-reliance, Meaningfulness and Existential Aloneness. Equanimity can be interpreted as having a balanced perspective of one's life; Perseverance: being able to practice perseverance, also when faced with adversity; Self-reliance: a belief in one's capabilities and a realistic view on one's limitations; Meaningfulness: the conviction that life has a meaning; Existential Aloneness: the realisation that each person's life path is unique and that only some experiences can be shared with others (Wagnild & Young, 1993; Portzky, 2008).

The *RS-nl* consists of 25 items that are all positively worded except for item (11) I doubt the meaning of life. In some other studies a 26th item is used: I am resilient. In the *RS-nl* this has not been included, amongst other reasons because of a lack of agreement on a proper Dutch translation. What is more, respondents can have different opinions about the definition of resilience. In the present research we did choose to pose this question to the respondents. This will be explained later. The response on this 26th item will be discussed separately.

Respondents answer all questions on a scale from 1 to 5, in which 1 stands for completely disagree and 5 stands for completely agree.

Response distribution

Table 4.2.1 shows how the total number of respondents responded to each separate item of the *RS-nl*. From the table it can be concluded that for most of the items more than half of the respondents answered in the category 'Agree'. The highest score can be attributed to item (5) I can be on my own if I have to, with a mean score of 4.22 (standard deviation 0.71). By this respondents indicate that they can be alone when they have to and do not necessarily need companionship from others. Other items that showed a high score are (4) Keeping interested in things is important to me, (21) My life has meaning, and (18) In an emergency, I am someone people generally can rely on, with mean scores of respectively 4.13 (0.60), 4.12 (0.73) and 4.11 (0.62). The last item is interesting for this research, as it specifically focuses on psychosocial resilience in relation to disasters. Apparently respondents have the feeling that, in case of an emergency, they could make themselves useful to others.

Item (3) I am able to depend on myself more than I expect others are able to depend on themselves, showed the lowest score with a mean of 3.48 (0.78). A percentage of 43 did not agree with this. An explanation can be that people find it difficult to assess how other people see themselves, causing a majority to respond neutrally to this statement. This was also found during the usability test. Other items that showed low scores are (17) My belief in myself gets me through hard times, and (22) I do not dwell on things that I cannot do anything about, on which respondents obtained mean scores of 3.59 (0.93) and 3.62 (0.83).

For the item (13) I can get through difficult times because I have experienced difficulty before, an additional response option was offered 'not applicable'. This response category was added on recommendation of the advisory board, seeing as not everyone has experienced difficult moments in his/her life. Young adults were especially kept in mind here. Finally, 37 respondents (2.3 percent) indicated that this question did not apply to them of which 14 were between the age of 16 and 25. Generally, respondents seem to respond positively to the items. With the exception of item (3) more than half of the respondents indicate to agree (completely) with the statements.

Table 4.2.1 Mean score per item and response distribution in percentages according to item where N=1361

Nr.	Item	Mean (SD)	Response distribution in percentages				
			Completely disagree	Disagree	Neither disagree nor agree	Agree	Completely agree
1	When I make plans I follow through with them	3.90 (0.66)	0.1	2.5	18.4	64.7	14.2
2	I usually manage one way or another	4.09 (0.57)	0.2	1.2	7.4	71.9	19.2
3	I am able to depend on myself more than I expect others to be able to depend on themselves	3.48 (0.78)	0.5	7.8	43.5	39.7	8.5
4	Keeping interested in things is important to me	4.13 (0.60)	0.1	0.6	10.1	65.2	24.0
5	I can be on my own if I have to	4.22 (0.71)	0.4	2.6	6.8	55.5	34.8
6	I feel proud that I have accomplished things in my life	4.04 (0.72)	0.2	1.8	17.3	55.8	25.0
7	I usually take things in stride	3.86 (0.70)	0.1	3.5	21.3	60.8	14.3
8	I am friends with myself	3.80 (0.73)	0.6	4.3	21.6	61.1	12.4
9	I feel that I can handle many things at the a time	3.66 (0.81)	0.4	8.4	28.5	50.6	12.0
10	I am determined	3.75 (0.73)	0.1	4.3	28.7	54.1	12.9
11	I doubt the meaning of life	2.13 (0.99)	30.8	41.7	18.4	7.0	2.1
12	I take things one day at a time	3.89 (0.61)	0.0	2.1	18.2	68.0	11.5
13	I can get through difficult times because I have experienced difficulty before	3.89 (1.00)	0.6	4.9	15.3	52.2	24.8

Continued on the next page

Table 4.2.1 continued

Nr.	Item	Mean (SD)	Response distribution in percentages				
			Completely disagree	Disagree	Neither disagree nor agree	Agree	Completely agree
14	I have self-discipline	3.75 (0.75)	0.4	6.0	23.9	57.8	11.9
15	I keep interested in things	4.03 (0.57)	0.1	1.0	11.0	71.3	16.6
16	I can usually find something to laugh about	3.90 (0.68)	0.4	2.4	19.1	62.7	15.4
17	My belief in myself gets me through hard times	3.59 (0.93)	4.5	6.2	26.2	51.9	11.3
18	In an emergency, I am someone people can generally rely on	4.11 (0.62)	0.1	0.8	11.1	63.7	24.2
19	I can usually look at a situation in a number of ways	3.96 (0.64)	0.0	2.1	15.8	65.8	16.3
20	Sometimes I make myself do things whether I want to or not	3.72 (0.79)	0.5	7.9	22.8	57.1	11.8
21	My life has meaning	4.12 (0.73)	0.7	1.8	11.4	56.6	29.5
22	I do not dwell on things I cannot do anything about	3.62 (0.86)	0.7	10.1	28.9	47.5	12.7
23	When I am in a difficult situation, I can usually find my way out of it	3.78 (0.64)	0.1	2.4	26.0	62.5	9.0
24	I have enough energy to do what I have to do	3.74 (0.76)	0.4	6.8	21.9	60.2	10.7
25	It is okay if there are people who do not like me	3.63 (0.91)	1.5	11.5	22.9	50.0	14.0

The respondents have a total *RS-nl* mean of 96.57 (9.34) on a scale of 25 to 125. Compared to the mean scores of other studies this appears to be reasonable. The results for several studies are displayed in table 4.2.2.

Converted to a seven-point scale the mean of the present sample survey results in 135.2. This lies within -1 standard deviation of the mean score of the sample survey of Wagnild & Young and the research of Lundman *et al.* (2007). The respondents from the sample survey do not appear to score divergently compared to the other studies. In a comparative research on several studies conducted by means of the Resilience Scale, Wagnild (2009) does point out that respondents appear to score very high on this tool (scores ≥ 147). According to her, the questionnaire is susceptible to socially desirable response, because it is relatively easy for respondents to guess the 'correct' answers.

Table 4.2.2 Mean scores of total *RS-nl* score on a scale of 25 to 175 and 1 to 5

Schaal	N	Mean*	Mean**
Resilience Monitor (2010)	1361	135,20	3,86
Wagnild & Young (1993)	810	147,9	4,23
Heilemann <i>et al.</i> (2003)	147	124	3,54
Lundman <i>et al.</i> (2007)	1719	141	4,03
Portzky (2008)	3265	143,9	4,11

* scale of 25 to 175

** scale of 1 to 5

Even though in theory it is often assumed that there is a relationship between different socio-economic factors such as age, gender and education, the present dataset does not support such connections.

Response distribution 'I am resilient'

In the original English questionnaire a 26th item is included: I am resilient. When developing the *RS-nl* the researchers explicitly choose not to include this item, because of the ambiguity of the Dutch translation (Portzky, 2008). However, this item does offer a chance to directly ask people about their resilience and to let them assess it. In agreement with the advisory board it was decided to include the item (26) I am resilient, in the questionnaire. Furthermore it was considered important to add a short description of what is understood by resilience. This creates a clear picture. Again in discussion with the advisory board the following explanation was chosen:

*By resilience the following is meant. Being capable of executing normal, **daily tasks** (for example, work, household chores, taking care of the children, etc.), being able to **relax** (for example by reading a book, exercising, watching TV, practicing a hobby etc.) and **keeping in touch with loved ones** (for example by doing things together, talking, showing interest in the other person, etc.) after a disaster.*

Table 4.2.3 shows that 79.1 percent of the respondents (completely) agree with the statement: I am resilient. They estimate their ability to be resilient after a disaster at a high level. A very small percentage thinks they will not be resilient (at all) and less than 20 percent doubts his or her ability to be resilient after a disaster.

Table 4.2.3 Mean Score item (26) I am resilient, and the response distribution in percentages according to item N=1361 (M=653/F=708)

Item	Mean (SD)	Response distribution in percentages				
		Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
I am resilient	3.90 (0.65)	0.2	2.4	18.3	65.5	13.6
Male	3.95 (0.64)	0.2	2.0	16.1	65.8	15.9
Female	3.85 (0.65)	0.3	2.7	20.1	65.3	11.4

Despite the fact that men score relatively higher than women, there appears to be no connection between gender and self-assessment of resilience. Also for socio-economic factors such as age, income, and education these appear to be non-existent.

Reliability analysis RS-nl

The reliability analysis has been administered for the 25 *RS-nl* items and the 26th item from the original Resilience Scale of Wagnild & Young (1993). This item will be included in all further analyses. As is shown in table 4.2.4, in the present study the Cronbach's alpha of the *RS-nl* has a value of 0.88. All items contribute to the reliability. Cronbach's alpha would decrease if one of the items is removed.⁴

This means that all 26 items together form a valid scale for psychological resilience. Furthermore, the established value is concurrent with alpha's found in other studies. In the research by Portzky (2008) the *RS-nl* achieved an internal consistency of 0.85 and the original research by Wagnild & Young from 1993 attained a Cronbach's alpha of 0.89. Also in 12 other studies based on the English Resilience Scale, values between 0.72 and 0.94 were determined (Wagnild, 2009).

As described before, the theoretical model behind the Resilience Scale is based on a five-factor structure, but most studies establish just two separate factors (Wagnild & Young, 1993; Heilemann *et*

⁴ Specific data of all processed exploratory analyses of chapter 4 can be requested from the first author

al., 2003; Portzky, 2008): Personal Competence, and Acceptance of Self and Life. In the current research, the internal consistency of the sub-scale Personal Competence has an alpha of 0.83 and for Acceptance of Self and Life 0.74. In the research by Portzky (2008) these values were established at respectively 0.81 and 0.68.

Table 4.2.4 Reliability RS-nl according to sub-scales with accompanying items when N=1361

		Reliability (Cronbach's α)
Total <i>RS-nl</i>		0.88
Acceptance of Self and Life		0.74
Nr.	Item	
7	I usually take things in stride	
8	I am friends with myself	
11	I doubt the meaning of life	
12	I take things one day at a time	
16	I can usually find something to laugh about	
21	My life has meaning	
22	I do not dwell on things that I cannot do anything about	
25	It is okay if there are people who do not like me	
Personal Competence		0.83
Nr.	Item	
1	When I make plans I follow through with them	
2	I usually manage one way or another	
3	I am able to depend on myself more than I expect others to be able to depend on themselves	
4	Keeping interested in things is important to me	
5	I can be on my own if I have to	
6	I feel proud that I have accomplished things in my life	
9	I feel that I can handle many things at a time	
10	I am determined	
13	I can get through difficult times because I have experienced difficulty before	
14	I have self-discipline	
15	I keep interested in things	
17	My belief in myself gets me through hard times	
18	In an emergency, I am someone people can rely on	
19	I can usually look at a situation in a number of ways	
20	Sometimes I make myself do things whether I want to or not	
23	When I am in a difficult situation, I can usually find my way out of it	
24	I have enough energy to do what I have to do	

Conclusion

For the present sample survey the mean score on the *RS-nl* is high with a mean score of 96.57 (9.34) on a scale of 25 to 125. In comparison with other studies this appears to be a normal score. Furthermore, there appears to be no significant connection between the *RS-nl* score and the socio-economic factors age, gender, education and income.

The original *RS-nl* is divided into two components or sub-scales: Personal Competence and Acceptance of Self and Life. For the present research the reliability of these sub-scales and the total *RS-nl* is established at respective alpha values of 0.83, 0.74 and 0.88. These are acceptable and comparable to values identified in other research.

4.2.3 Exploratory components analysis

Based on the theoretical model illustrated by Wagnild & Young, it was expected that the *RS-nl* would generate a five-component structure. A Principal Components analysis was conducted with Promax rotation and Kaiser normalisation. During this analysis six separate factors were found. They have a total explained variance of 53.38 percent. A primary component can be distinguished, which explains 27.29 percent of the variance.

Four items do not load on any component with a value of ≥ 0.40 . It concerns (9) I feel that I can handle many things at a time, (17) My belief in myself gets me through hard times, (18) In an emergency, I am someone people can rely on, and (24) I have enough energy to do what I have to do.

The theoretical model by Wagnild & Young in which five factors are distinguished, namely Equanimity, Perseverance, Self-reliance, Meaningfulness and Existential Aloneness, is not supported by the data currently presented. Other research does not confirm the occurrence of five factors either, amongst which the research of Wagnild & Young (1993) itself. They were able to determine only two separate factors already discussed in previous sections: Personal Competence and Acceptance of Self and Life. In several studies using the Resilience Scale, these two factors explain between 29.7 and 48.0 percent of the established variance (Wagnild & Young, 1993; Heilemann, 2003; Portzky, 2008).

An exception is the research by Lundman *et al.* (2007), which is also the most similar to the current research regarding research population and sample size. In their research they test and validate the Swedish translation of the Resilience Scale and do manage to establish a five-component structure with an explained variance of 52.5 percent.

In order to achieve the five-component structure, in the present study a search will have to be conducted for items that fit into a specific construct. A better alternative is to specifically search for the two components that have been established in prior studies: Personal Competence and Acceptance of Self and Life.

Another Principle Components analysis with Promax rotation is conducted, in which the number of components to be identified is forced to two. Table 4.2.5 presents the results of this analysis. It becomes clear that this two-component structure does not convincingly emerge from the data either. As much as six items do not load on either of the two components with more than 0.40: (2) I usually manage one way or another, (12) I take things one day at a time, (16) I can usually find something to laugh about, (23) When I am in a difficult situation, I can usually find my way out of it, (25) It is okay if there are people who do not like me, (26) I am resilient. An option is to remove non-loading items from the scale. However, content wise it can be expected that these items possibly form a third new component, since they all relate to the way in which a difficult situation is approached and the way in which such a situation is dealt with.

Table 4.2.5 Principal Components Analysis with Promax Rotation and determining on 2 components

Item	Nr.	Component	
		1	2
I keep interested in things	15	0,65	
I can usually look at a situation in a number of ways	19	0,64	
Keeping interested in things is important to me	4	0,64	
Sometimes I make myself do things whether I want to or not	20	0,59	
In an emergency, I am someone people can generally rely on	18	0,58	
I can be on my own if I have to	5	0,54	
I have self-discipline	14	0,52	
I am able to depend on myself more than I expect others to be able to depend on themselves	3	0,50	
I am determined	10	0,47	
When I make plans I follow through with them	1	0,46	
I feel that I can handle many things at a time	9	0,41	
I can get through difficult times because I have experienced difficulty before	13	0,41	
I usually take things in stride	7	0,40	
I take things one day at a time	12	0,38	
I usually manage one way or another	2	0,33	
I am resilient	26	0,32	
It is okay if there are people who do not like me	25	0,19	
My life has meaning	21		0,85
I doubt the meaning of life	11		0,82
I am friends with myself	8		0,77
I do not dwell on things I cannot do anything about	22		0,53
I feel proud that I have accomplished things in my life	6		0,49
I have enough energy to do what I have to do	24		0,48
My belief in myself gets me through hard times	17		0,42
When I am in a difficult situation, I can usually find my way out of it	23		0,37
I can usually find something to laugh about	16		0,32

A new factor analysis, in which the number of constructs to be identified is forced to three, mainly shows the same pattern as the analysis with two factors. As expected, the six items 2, 12, 16, 23, 25 and 26 are placed together with various items from Personal Competence. What is remarkable about the results of this analysis is that five items do not load on any of the components and that another six items only weakly load on one of the components with a value of <0.50. Therefore it was decided to maintain the item arrangement of the two-factor analysis and to examine by means of a reliability analysis whether the six non-loading items form a separate construct. The results are presented in table 4.2.6.

Evidently, the alpha for the six items is acceptable with a value of 0.67. However, the reliability of a possible sub-scale, Coping with difficult circumstances, can be enhanced substantially. When the item (25) It is okay if there are people who do not like me, is removed, the alpha increases to a value of 0.70.

Table 4.2.6 Reliability and internal consistence of Coping with difficult circumstances when N=1361

		Reliability (Cronbach's α)	Item-total correlation	α when item deleted
Coping with difficult circumstances		0.67		
Nr.	Item			
12	I take things one day at a time		0.45	0.61
2	I usually manage one way or another		0.40	0.63
26	I am resilient		0.45	0.61
25	It is okay if there are people who do not like me		0.27	0.70
23	When I am in a difficult situation, I can usually find my way out of it		0.52	0.59
16	I can usually find something to laugh about		0.40	0.63

Furthermore, a reliability analysis was administered for the two components from the exploratory components analysis. These sub-scales also achieve high alphas. Personal competence achieves a value of 0.81 and Acceptance of Self and Life 0.74. Regarding item arrangement, these two sub-scales strongly relate to the components identified by Wagnild & Young (1993) and Portzky (2008). Therefore, we chose to roughly use the same names, the only difference being a modification of Acceptation of Self and Life into Value of Self and Life. This was decided because the items indicate evaluation of self and life more than acceptance or resignation.

Based on these steps three constructs are distinguished within psychological resilience: Personal Competence, Value of Self and Life, and Coping with difficult Circumstances. Finally, it is also noted that one item, (7) I usually take things in stride, loads at an exact marginal value of 0.40 and is therefore placed under the Personal Competence. On grounds of face validity the item would better fit into Coping with Difficult Circumstances. The reliability analysis demonstrates that removing this item from Personal Competence causes a slight decrease of Cronbach's alpha of 0.81 to 0.79. Adding this item to Coping with Difficult Circumstances results in a substantial increase of the reliability of this component though. Cronbach's alpha increases from 0.70 to 0.77. For this reason it was decided to add the item to the third construct, which then contains six items.

4.2.4 Conclusion

Psychological resilience consists of three sub-constructs. In table 4.2.7 an overview is provided of the psychological resilience components with accompanying items and alpha value. Only one item was removed, because it does not load on any of the components: (25) It is okay if there are people who do not like me. Consequently, psychological resilience can be measured in 24 original *RS-nl* questions plus the 26th item I am resilient. When joining these 25 items, the umbrella construct Psychological resilience achieves reliability of 0.89.

Table 4.2.7 Psychological resilience components with accompanying items and alpha-value

Component	Nr items	Items	α
Personal Competence	12	1,3,4,5,9,10,13,14,15, 18,19,20	0.79
Value Self and Life	7	6,8,11,17,21,22,24	0.74
Dealing with difficult circumstances	6	2,7,12,16,23,26	0.77
Deleted items	1	25	
Psychological resilience	25		0.89

4.3 Social context

4.3.1 Introduction

In chapter 3, the connection between social context, people's attachment to their environment and their psychosocial resilience is described. It appears that the perception people have of their social life is important. When people are satisfied with their own social network and have the idea they can rely on it in difficult times, this can influence psychosocial resilience positively (Bonnano *et al.*, 2005; Benight *et al.*, 2006; Moscardino *et al.*, 2009).

Furthermore, the extended social environment is also important. Disorder of the normal social life in the community or at work caused by a disaster, can lead to stress and health risks (Ursano *et al.*, 2008). Conversely, a healthy community marked by, amongst other things, healthy mutual contact, quality of life and a limited degree of forms of inequality, can contribute to the adaptability of an individual (Luthar *et al.*, 2000; Norris *et al.*, 2008).

In this chapter social context is mapped by means of the sub-scale *Social Optimism* of the Positive Outcome List (Appelo, 2005) and the *Community Involvement* scale (*Betrokkenheid bij Buren*, Frieling, 2008). In 4.3.2 results from the sub-scale *Social Optimism* will be further discussed, after which 4.3.3 will deal with the outcomes of *Community Involvement*.

The focus of the subsequent section will lie on the two additional questions concerning attachment to place. Subsequently, the factor structure of both scales and the two additional questions are tested in 4.3.5. Finally, 4.3.6 illustrates the consequences for further analysis.

4.3.2 Sub-scale Social Optimism

Response distribution

In table 4.3.1 the response distribution of the sub-scale *Social Optimism* is presented. Respondents could respond on a scale of 1 to 5, for which 1 is the lowest and 5 is the highest value. Item (1) I can count on others, achieved the highest score with a mean of 4.08 (0.66). More than 80 percent of the respondents (completely) agreed with this statement. Even though respondents are convinced that they will receive support from others when required, almost a fifth is not satisfied with the number of social contacts they have. On this item (3) the lowest score of all three was noted, with a mean of 3.95 (0.78).

For the total sub-scale *Social Optimism* a minimum of three and a maximum of fifteen points could be achieved. The respondents scored a mean of 12.02 points with a standard deviation of 1.75. Converted to the original measurement level this means that respondents scored a mean of 4.01 on a scale of 1 to 5. Regarding their social contacts and their own functioning therein, people are optimistic.

In the validity research of the PUL two separate measurements were executed, for which respondents achieved mean scores of 10.5 (1.6) and 10.4 (1.7) points on *Social Optimism*. The original PUL is, however, a four-point scale with a probability score between 3 and 12. Converted to this scale, respondents of the present sample survey scored a mean of 9.62. On a scale of 1 to 4, a mean score of 3.21 was achieved in the present study. In the two measurements of the PUL this was 3.50 and 3.46. The respondents do not appear to score significantly different from the respondents of the validity research of the *PUL*.

There appears to be no significant statistical connection between gender and the score on *Social Optimism*. Moreover, there was no statistical connection found for the other features such as income, education and age.

Table 4.3.1 Mean score (standard deviation) and response distribution in percentages for Social Optimism on a scale of 1-5 where N=1361

Nr.	Item	Mean (SD)	Response distribution in percentages				
			Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
1	I can count on others	4.08 (0.66)	0.6	1.9	9.8	63.8	23.8
2	I function well in social contacts	4.00 (0.70)	0.4	3.0	15.8	60.5	20.3
3	I am satisfied with the number of contacts that I have	3.95 (0.78)	0.7	5.6	13.3	59.3	21.1

Reliability analysis Social Optimism

The reliability analysis signifies that the sub-scale *Social Optimism* is internally valid with an alpha of 0.75. This corresponds to the value that was identified by Appelo (2005) amongst the general population of Groningen. All items contribute to the reliability of the scale.

Conclusion

The respondents appear to score reasonably high on the *Social Optimism* scale. For all three items, three fourths answered that they (completely) agree with the statement.

There appears to be no significant statistic correlation between the score on *Social Optimism* and socio-economic factors such as gender, income, education and age.

The internal validity of *Social Optimism* is satisfactory with an alpha of 0.75, which corresponds exactly with the value found by Appelo (2005).

4.3.3 Community Involvement Scale

Response distribution

Respondents responded to the items on a five-point scale, where 1 was the lowest value and 5 the highest.

Table 4.3.2 demonstrates that the items that show a superficial form of social cohesion and require relatively little effort from the respondents particularly receive high scores. They are easy to realise. Item (1) How often did you talk to someone in your neighbourhood in the past half-year? scored the highest with a mean of 4.77 (0.60). The items (2) and (3) follow behind with mean scores of respectively 4.65 (0.69) and 4.48 (0.66).

For items that require a greater degree of involvement, such as going to or organising parties or activities, mean scores were significantly lower. Almost three fourths of the respondents (71.9 percent) indicate that getting together with others to organise an activity occurs once a year or not at all. The mean score adds up to a mere 2.18 (1.00). Even though item (6) also scores relatively low with a mean of 3.68 (0.75), 54 percent indicate to often or always go to activities to which a number of people are invited.

In the original research by Frieling (2008) respondents also gained the highest scores on the first three items; items that require relatively little effort and time.

The respondents from the present research achieved higher means than was done in the reliability research by Frieling in 2008, in which the difference is one whole point on a scale from 1 to 5 and, in

case of more intensive forms of social cohesion even two points. An explanation for this can be that the present research is not limited to the neighbourhood, but is also focused on the environment. The environment contains a greater variety of relationships and therefore it is possible that people based their answers on the relations they contacted most frequently (e.g. family and friends), while the research by Frieling (2008) concerns a limited social environment.

Table 4.3.2 Mean score (standard deviation) *Community Involvement** per item and response distribution on a scale of 1 to 5 where N=1361

Item	Valid %	Mean (SD)	Response distribution in percentages				
			1	2	3	4	5
Talk	100	4.77 (0.60)	0.1	0.9	6.0	7.5	85.5
Keep eye on	100	4.65 (0.69)	0.9	1.2	3.6	20.4	74.0
Information	100	4.48 (0.66)	0.2	1.0	5.0	38.6	55.3
Involved	100	3.94 (0.63)	0.1	1.2	18.9	64.3	15.5
Compassion	100	4.45 (0.74)	0.3	1.8	7.9	32.2	57.8
sad							
Go to parties	82.2	3.68 (0.75)	0.8	3.9	23.5	46.4	7.6
Organise	100	2.18 (1.00)	24.2	47.7	18.5	5.2	4.4

*For complete items please refer to chapter 3

There appears to be no connection between the score on social cohesion and socio-economic factors such as gender, age and education.

Furthermore, the degree of urbanity and a possible connection between the social cohesion items is examined. It is expected that city dwellers are more likely to move house than people from less urban environments, for the reason that they would search for surroundings where they are more socially comfortable and people are friendlier (Central Bureau for Statistics, 2006). The data shows that people from rural areas score higher means (21.81) than city dwellers (21.07). However, a statistical connection between the score on social cohesion and degree of urbanity is not found.

Reliability analysis Community Involvement

The *Community Involvement* scale has validity on Cronbach's alpha of 0.67. Despite not being very high, this result is acceptable. All items contribute to the reliability. Removing one of the items would lead to a lower Cronbach's alpha.

Conclusion

Respondents score relatively high on several items in the *Community Involvement* scale. This may be because the current research includes questions in a broad sense by incorporating the complete social environment, amongst which family, friends and work, instead of just the neighbourhood. For various socio-economic factors there appears to be no connection to the score that people obtain on various items. Also the degree of urbanism of the living environment appears to have little influence on the score. The reliability of the *Community Involvement* scale is acceptable with an alpha of 0.67.

4.3.4 Attachment to place

The additional questions involve the degree to which people feel attached to a place. The literature shows that attachment to place (in case of a disaster) can influence resilience (Paton *et al.*, 2001; Kimweli & Stilwel, 22002; Norris *et al.*, 2008).

Respondents could respond on a five-point scale where 1 was the lowest value and 5 the highest.

Response distribution

Table 4.3.3 shows that almost two thirds of the respondents (64.6 percent) (completely) agree with the statement that they feel attached to the neighbourhood in which they live. What is more, three quarters of the respondents indicate that they would like to continue living in the present neighbourhood for another few years (84.4%).

There appears to be a significant connection between the degree to which people feel attached to the neighbourhood and the degree to which they would like to continue living in the neighbourhood with a value of $\rho = 0.50$.

Table 4.3.3 Mean score (standard deviation) and response distribution in percentages per item on a scale of 1 to 5 where N=1361

Item	Mean (SD)	Response distribution in percentages				
		Completely disagree	Disagree	Neither disagree nor agree	Agree	Completely agree
I feel attached to the neighbourhood in which I live	2.69 (0.86)	1.5	7.3	26.7	50.3	14.3
I would certainly like to continue living in this neighbourhood for a few more years	3.17 (0.84)	1.2	3.5	10.9	46.0	38.4

There was no connection found between socio-economic factors such as gender, age and education and the score on separate items. There does appear to be a trend, which shows that as people grow older, they feel more attached to the neighbourhood and are inclined to want to continue living there. Values for rho were weak with values of respectively 0.20 and 0.26.

Again the possibility of a connection between urbanity and both items was observed and it was expected that city dwellers would feel less attached and would be less inclined to want to continue living in the same neighbourhood for a longer period of time. The data do not support this expectation.

The results displayed in table 4.3.3 show that the respondents are (very) positive about their own neighbourhood. Similar results were obtained in the Housing Requirements Study of the Ministry of VROM (Housing, Spatial Planning and Environment) in 2004. Eighty-six of the respondents indicated to be (very) satisfied with their neighbourhood. The report signifies that particularly the social interaction with neighbours has a great influence on the total assessment of the neighbourhood. A later Housing Requirement Study confirms the importance of social interaction in the living environment (Central Bureau for Statistics, 2006). Respondents do not appear to have given socially acceptable answers.

Reliability analysis Attachment to place

The reliability analysis indicates that the Cronbach's alpha of the two items together have a value of 0.69. This is sufficiently acceptable to form a sub-construct Attachment to Place.

Conclusion

Respondents obtain high scores on the two items, which indicates that they generally feel satisfied with their neighbourhood. This correlates with prior studies done by the government. In this respect the scores do not seem to deviate.

There appears to be no clear connection between the score on the items and socio-economic factors such as gender, age, education and income. Moreover, an expected connection with the degree of urbanity is not confirmed by the data.

The reliability of the two items together is acceptable with an alpha of 0.69. The data offers a basis for a possible joining of these items into a sub-scale, which concerns people's attachment to place.

4.3.5 Exploratory components analysis

Based on the PUL it is hypothesised that the sub-scale *Social Optimism* can be identified as a component in the exploratory analysis. Additionally, the *Community Involvement* scale is based on three underlying theoretical components: co-operating in creating wellbeing, solidarity and sense of involvement. It is expected that these will be established as three separate components. Finally, it is assumed that the two additional questions will form a component attachment to place together. In total, five components are expected from the exploratory analysis.

A Principal Components Analysis with Promax rotation is conducted. The results, displayed in table 4.3.4, show that four significant components can be distinguished. First of all, various items of the *Community Involvement* scale form a component. Secondly, the three items of the sub-scale *Social Optimism* are distinguished clearly and the two items related to attachment to place form a component together as well. Finally, the two remaining *Community Involvement* items form another separate factor.

In chapter 2.4 it is explained that the *Community Involvement* scale, developed by Frieling (2008), is based on three theoretical components: Co-operating in creating Wellbeing, Solidarity, and Feelings of Involvement. These are not supported by the data. However, in her thesis, Frieling (2008) speaks of a duality in social cohesion consisting of a superficial, passive form of social cohesion and a profound, active social cohesion. This appears to be supported by the present research to an even greater degree. The first component found, can consist of superficial social cohesion, because sharing information, keeping an eye on things and sense of involvement with others are actions that can be conducted without requirement of much effort or time. The fourth component does require much more effort of the respondents by either organising an event in the neighbourhood or going to one.

Therefore it is acceptable to use the four components from the exploratory analysis to conduct further calculations in order to analyse whether they are reliable as sub-scales of social context. Consequently, a reliability analysis is conducted.

Table 4.3.4 Principal Components Analysis with Promax rotation

Item	Component			
	1	2	3	4
1 Information	0.84			
2 Compassion sad	0.71			
3 Keep an eye on	0.63			
4 Involved	0.53			
5 Talk	0.52			
6 I am satisfied with the number of social contacts that I have		0.86		
7 I function well in social contacts		0.81		
8 I can count on others		0.75		
9 I certainly would like to continue living in this neighbourhood			0.90	
10 I feel attached to the neighbourhood in which I live			0.77	
11 Organise				0.84
12 Go to parties				0.73

In the previous section a reliability analysis was conducted on the sub-scale *Social Optimism*, in which an alpha of 0.75 was obtained. Seeing as the exploratory analysis indicates that these three items do indeed form a sub-construct, this analysis does not have to be repeated.

The second sub-construct from the explorative analysis consists of several items from the *Community Involvement* scale. Together these form a superficial variant of social cohesion. The reliability analysis indicates that this sub-scale has an alpha value of 0.69, which is acceptable. However, by removing the item (1) How often have you talked to someone in your neighbourhood in the past half year?, the reliability of the scale increases to 0.70.

The third construct consists of the items that concern attachment to place: (1) I would certainly like to continue living in this neighbourhood, and (2) I feel attached to the neighbourhood in which I live. With a Cronbach's alpha of 0.69 these items are allowed to form a sub-scale together.

Finally, the exploratory analysis indicates that the two remaining items from the *Community Involvement* scale (6) Are there any parties or other activities in your neighbourhood to which a number of people are invited? How often do you go to these parties or activities? And (7) In the past year, how often have you co-operated with others in your neighbourhood to organise something, like a party?, form a fourth sub-construct within the social context. These items signify more profound and more active forms of social cohesion. The reliability of a sub-scale Active Social Support is, however, not sufficient with an alpha of 0.48. The data do not support the existence of such a sub-scale. As a result these two items will be removed.

A final reliability analysis is conducted to test whether the data support the validity of a Social Context construct. This construct, consisting of nine items, obtains a Cronbach's alpha of 0.65. This is acceptable.

4.3.6 Conclusion

Social Context consists of three sub-constructs: *Social Optimism*, formed by three items from the original PUL-list, Social Support, which consists of four items from the *Community Involvement* scale and finally Attachment to place, made up out of two additional items.

Table 4.3.5 Social context components with accompanying items and alpha value

Component	Number of items	Items	α
Social Optimism	3	I can count on others, I function well in social contacts, I am satisfied with the number of social contacts that I have	0.75
Social Support	4	Eye, up to date, involved, support	0.69
Attachment to place	2	I certainly would like to continue living in this neighbourhood, I feel attached to the neighbourhood in which I live	0.69
Deleted Items	3	Talk, go to party, organise	
Social Context	9		0.65

4.4 Trust in government and information

4.4.1 Introduction

The relationship between citizens and their government can play an important role in the emergence of psychosocial resilience after a disaster. Two aspects that are important here can be distinguished.

First of all, it is important to consider the communication of information from the government to the citizens. In case of disasters this should be quick, factual and clear. This allows people to react in a way that secures their safety and wellbeing (Heldring, 2004; Rogers *et al.*, 2007). In 4.4.2 aspects such as completeness, reliability and comprehensiveness of information will be central. In this respect, not only will questions be asked about the government as a source of information, but also about radio and TV, newspapers, Internet, social media and universities. A differentiation will be made between national and local governments, because local sources of information may be better trusted than relatively remote sources (Norris & Stevens, 2007). Furthermore, in 4.4.2 the respondents are asked to which extent they are satisfied with the swiftness of the information provision by the government.

The more people trust the information provided by the government, the smaller the chance that people will consult other, perhaps less reliable, sources of information (Archetti & Taylor, 2004). Moreover, the more people are inclined to consult alternative sources of information, the more likely they are to develop psychosocial complaints (Maesele *et al.*, 2008). Even though people may have relatively little trust in the information provided by the government, it is possible that they will follow the advice given by the government during a disaster. This is also discussed in 4.4.2.

Secondly, the community should trust the capacities of the government. If citizens think that the government is well prepared for disasters, they will show more resilience (Maesele *et al.*, 2008). Linked to this is people's view on the government and the extent to which the government is able to deal with the consequences of a possible disaster. 4.4.3 will discuss the results of these questions.

Based on the results presented in 4.4.2 and 4.4.3 we will examine whether an umbrella construct exists that reveals the degree of trust a citizen has in information as well as capacities. This will be explained in 4.4.4.

Finally, the conclusions will be presented in 4.4.5.

4.4.2 Trust in information

In this section the results of the questions about the degree of completeness, comprehensiveness and reliability of information by several sources of information will be discussed consecutively.

Respondents were asked to rate these aspects on a scale of 1 to 5. The lowest score is represented by 1 and the highest by 5. There was also a sixth response option 'no opinion'. Based on the usability test, this response category is added to all questions relating to Trust in Information. During the test a couple of respondents indicated that they did not have an opinion about some sources of information and therefore required this response category. Although, in the distribution such answers do show something about the relative position of certain sources of information, the respondents have not taken a stance about, for example the degree of reliability of a certain source of information. In the data file these answers have therefore been coded as missing value, and therefore not considered in further calculations.

The respondents were also asked to indicate on a five-point scale to which extent they are satisfied about the swiftness of the information provision by the government.

Completeness of information

Respondents were presented with the following question: 'How much trust do you have in the completeness of information about disasters from the following organisations/sources?'

Table 4.4.1 presents the response distribution with the mean scores (standard deviations). Evidently, radio and TV score the highest with a mean score of 3.64 (0.76). Sixty percent have quite some/a lot of trust in the completeness of the information presented by radio and TV. Social media are given the lowest scores with a mean of 2.37 (1.10). Social media include websites and forums such as hyves, facebook, youtube and twitter.

It can be expected that respondents in the younger age category (up to 36 years of age) have a more positive view on the completeness of information provided through social media. This does appear to be the case in relation to completeness of information. Of the 331 respondents in the age up to 36 years, 43.8 percent have a lot of trust in the completeness of information. This differs from the outcome presented in table 4.4.1.

The national government and the municipalities score relatively high with mean scores of respectively 3.45 (0.89) and 3.42 (0.85). A majority of the respondents have (quite) a lot of trust in the completeness of the information from both national and local government.

Table 4.4.1 Mean score (standard deviation) and response distribution in percentages of the completeness of the information provided during disasters on a scale of 1-5 when N=1361

Source of information	Valid %	Mean (SD)	Response distribution in percentages				
			No trust at all	Little trust	Some trust	Quite some trust	A lot of trust
Radio and TV	99.3	3.64 (0.76)	0.2	3.7	33.4	53.8	8.2
National government	98.8	3.45 (0.89)	2.1	6.9	37.2	45.9	6.8
Municipality	98.8	3.42 (0.85)	1.3	7.6	39.5	44.9	5.6
Internet	98.0	3.34 (0.87)	0.8	8.1	44.0	41.1	4.0
Newspapers	98.8	3.31 (0.79)	0.7	8.1	48.8	38.8	2.9
Universities	87.7	2.91 (1.31)	1.6	7.8	43.4	31.1	3.9
Social media	91.4	2.37 (1.10)	6.8	35.5	39.9	8.9	1.2

Women appear to be more positive about the completeness of information from various sources than men. This is especially the case when it concerns information from the municipality, the national government and universities. However, a strong statistical connection was not found. Also for features such as age and education, there appear to be no strong connections with the degree to which people consider different sources of information complete.

Reliability analysis Completeness of information

Through a reliability analysis it can be established whether the items concerning completeness of information form a sub-scale together so as to measure trust in information. From the results of the analysis of Completeness of Information it appears that the Cronbach's alpha has a value of 0.79, which is satisfactory. Furthermore, all items contribute to the reliability of the sub-construct.

Comprehensiveness of information

The question that is central to this part is 'How comprehensive is the information from the following organisations?' Respondents could answer on a scale of 1 to 5, where 1 is the lowest and 5 is the highest value.

Table 4.4.2 demonstrates that especially the information provided by radio and TV is considered comprehensive with a mean score of 3.60 (0.98). Almost two thirds (66.3%) consider the information from these sources (very) comprehensive. Newspapers also get a relatively high mean on

comprehensiveness with a value of 3.39 (1.00). Conversely, the information from social media is considered a little or moderately comprehensive and therefore gets a mean score of 2.27 (1.32).

For this part it was also expected that younger age categories up to 36 years of age would have a more positive view on social media. In this case 19.7 percent of the 308 respondents indicate that they find information presented by social media (very) comprehensive. When we look at younger people in the category 16 to 25 years of age, 21.8 percent appear to think that information provided by social media is (very) comprehensive. This compared to 15.4 percent of the total sample survey.

It was observed that concerning the sources of information social media and universities a relatively large percentage of respondents (17.6 and 20.6 percent) indicate to have no opinion. An explanation could be that people do not know what is meant by social media, even though the questionnaire tries to prevent this by giving several examples of social media. Another explanation could be that people do not consider social media as a source of information or that people are not actively using social media.

For universities there could possibly be a relation to people's level of education. It appears that people who were higher educated also judged information from universities to be better. The rho is weak with a value of 0.23.

Both governments are positioned in the middle, where information provided by the national government is considered more comprehensive than the information provided by the municipality, based on mean scores of respectively 3.33 (1.09) and 3.27 (1.07).

Table 4.4.2 Mean scores (standard deviation) and response distribution in percentages concerning comprehensiveness of information given during disasters on a scale of 1-5 when N= 1361

Source of information	Valid %	Mean (SD)	Response distribution in percentages				
			No at all comprehensive	Slightly comprehensive	Moderately comprehensive	Quite comprehensive	Very comprehensive
Radio and TV	96.4	3.60 (0.98)	0.5	3.3	26.2	57.6	8.7
Newspapers	95.7	3.39 (1.00)	0.8	5.4	35.0	50.0	4.6
National government	94.7	3.33 (1.09)	1.6	6.5	33.4	47.9	5.3
Municipality	94.6	3.27 (1.07)	0.9	7.8	37.5	44.1	4.3
Internet	93.1	3.12 (1.14)	1.3	8.7	37.0	41.6	4.4
Social media	82.4	2.27 (1.32)	5.7	25.4	35.8	13.9	1.5
Universities	79.4	2.66 (1.53)	1.2	9.1	32.9	32.7	3.5

Women's responses about the comprehensiveness of information provided by different sources is generally more positive than the response provided by men. A strong significant correlation, however, does not show. Also other socio-economic features appear to have only weak connections with the degree to which people find information comprehensive.

Reliability analysis Comprehensiveness of information

Based on the reliability analysis the seven items regarding comprehensiveness of information are allowed to form a scale, considering that the Cronbach's alpha with a value of 0.84 is satisfactory. All items contribute constructively to the scale, removing one of them leads to a lower alpha.

Reliability of information

Respondents were asked to answer the question 'How reliable do you consider the information provided by the following organisations?' Respondents could answer on a scale of 1 to 5, where 1 is the lowest and 5 is the highest value.

As illustrated in table 4.4.3, the source radio and TV score the highest on reliability with a mean score of 3.67 (0.77) and social media score the lowest with a mean of 2.36 (1.10). The low score for social media is not unexpected. Social media allows people to express their own opinion. Information provided through this medium does not have to qualify for journalistic standards. Also when looking at the younger age categories there appears to be little trust in the reliability of social media. In the category up to 36 years of age (n=325), 9.8 percent consider information from social media (very) reliable and amongst younger people up to 25 year of age (n= 143) 12.6 percent have the same opinion. This should be compared to the 10.9 percent of the complete sample survey, as is presented in table 4.4.3.

The national government and municipalities score relatively high with mean scores of respectively 3.53 (0.89) and 3.45 (0.86). Information provided by municipalities is considered (very) reliable by 56.3 percent of respondents. For the national government, this percentage is higher at 60.2 percent. Less than ten percent consider information from the government (very) unreliable. These results correlate with a research conducted amongst the Flemish population in 2005 (personal communication Prof. Dr. Verleye). This research, administered amongst 1040 Flemish, specifically focused on terrorism and also examined the degree to which people considered the information provided by the Belgian government reliable. The national government obtained a mean score of 3.24 on a scale of 1 to 5. In the present study, the Dutch national government obtains a higher score with a mean of 3.53. Furthermore, a relatively greater percentage of the Flemish (21.8 percent) find the information provided by their national government (completely) unreliable. In the current research this is only 7.6 percent.

Table 4.4.3 Mean score (standard deviation) and response distribution in percentages concerning the reliability of the information provided during disasters on a scale of 1-5 when N=1361

Source of information	Valid %	Mean (SD)	Response distribution in percentages				
			Very unreliable	A little bit reliable	Somewhat reliable	Reliable	Very reliable
Radio and TV	99.0	3.67 (0.77)	0.3	3.2	31.1	56.1	8.4
National government	98.5	3.53 (0.89)	1.5	6.1	30.6	53.2	7.0
Municipality	98.4	3.45 (0.86)	0.9	6.8	34.5	50.6	5.7
Newspapers	98.7	3.39 (0.80)	0.6	6.2	45.4	42.6	3.9
Internet	96.9	3.22 (0.93)	1.3	9.2	45.8	37.6	2.9
Universities	87.3	3.01 (1.36)	1.1	6.7	37.0	36.8	5.7
Social media	90.1	2.36 (1.10)	6.5	33.3	39.5	9.9	1.0

Women are more positive about the reliability of information from various sources than men. However, a strong connection between gender and the assessment of reliability is not found. Also for other socio-economic features such as age and education only weak statistically significant connections were found with values of $-0.12 \leq \rho \leq 0.15$.

Reliability analysis Reliability of information

Once again a reliability analysis was conducted. This time, to establish whether the seven items of Reliability of information form a sub-scale together. The reliability analysis demonstrates that jointly the items obtain a Cronbach's value of 0.82, which is satisfactory. Just as for the analysis for Comprehensiveness of information, only the removal of the item Reliability of social media will lead to a higher alpha. However, the difference is not significant to a degree that the item needs to be excluded.

Swiftness of information

Finally the respondents were asked the question: 'To which extent are you satisfied about the swiftness of the information provision by the government?' Again, they could respond on a five-point scale where 1 corresponds to completely disagree and 5 to completely agree, and the additional option 'no opinion', which was coded as a missing value.

The swiftness by which information is presented to the public is important during disasters. The sooner the information is available, the less space is left for rumours and speculations. Moreover, the shorter the period of time that people remain in insecurity, the less people tend to rely on other sources of information (Archetti & Taylor, 2004; Rogers *et al.*, 2007).

On this aspect the government obtains a mean score of 3.46 (0.66). A majority of the respondents (51.7 percent) are (very) satisfied with the swiftness of the information provision by the government. Only 6.7 percent indicate to be (very) dissatisfied.

Women tend to be more positive about the swiftness of information provision by the government than men. Also on this aspect there appears to be only a very weak connection with gender with a value of Cramer's $V = 0.10$. Other socio-economic features such as age and education do not show a strong significant connection with satisfaction about swiftness either.

Taking advice

It appears that information from the municipality and the national government score lower on reliability and completeness than information presented by radio and TV. When it comes to comprehensiveness they also score lower than newspapers. Considering the conclusion that information from the government does not seem to be best appreciated on these aspects, it is interesting to see to which extent people are inclined to take advice provided by the government during disasters. Respondents were presented with the following question: 'To which extent would you follow the advice provided by the government during disasters?' They could answer on a scale from 1 to 5, where one holds the lowest and five the highest score.

The majority of the respondents (84.5 percent) would take the advice of the government during a disaster. Only a negligible percentage (1.5 percent) would mostly not or never take this.

Women appear to be more inclined to take advice from the government than men. However, this connection is weak with a Cramer's V of only 0.15. Furthermore, for factors of age and education a strong connection with the degree to which people would take advice from the government is missing.

Exploratory analysis Trust in Information

For the construct Trust in Information, it is assumed that three components form the basis: comprehensiveness and reliability of information. To find out whether the data supports these components, a Principal Components Analysis with Promax rotation is conducted.

Five components are found in which the clustering of items does not run along the expected factors. Furthermore, five items load with ≥ 0.40 on two components. This concerns the items: Comprehensiveness of information from the municipality, Comprehensiveness of information from the national government, Completeness of information from the Internet (general), Comprehensiveness of information from radio and TV, and finally Comprehensiveness of information from newspapers. Also,

when another analysis is undertaken and the number of components to be identified is fixed at three, the data does not appear to support any components via completeness, comprehensiveness and reliability of information. A distribution according to three constructs cannot be made and a structure according to the five components found by exploratory analysis does not seem meaningful. Better results are found when a distribution is made according to the seven different sources of information: municipal government, national government, radio and TV, newspapers, social media, Internet and universities. Table 4.4.4 shows the results from the exploratory analysis in which the number of components to be identified is established at seven.

Table 4.4.4 Principal Components Analysis with Promax rotation and constructs fixed at seven

Item	Component						
	1	2	3	4	5	6	7
reliability municipality	0.91						
reliability national government	0.85						
completeness municipality	0.84						
completeness national government	0.81						
comprehensiveness municipality	0.64						0.56
comprehensiveness national government	0.60						0.58
completeness social media		0.92					
reliability social media		0.91					
comprehensiveness social media		0.77					0.40
completeness universities			0.93				
reliability universities			0.88				
comprehensiveness universities			0.76				
reliability newspapers				0.91			
completeness newspapers				0.84			
comprehensiveness newspapers				0.69			0.52
reliability Internet (general)					0.89		
completeness Internet (general)					0.88		
completeness radio en TV						0.88	
comprehensiveness radio en TV						0.70	0.61
reliability radio en TV						0.69	
comprehensiveness Internet (general)					0.54		0.55

Six separate components are prominent, consisting of the different aspects of information to source of information. It is interesting that the first component is formed by aspects of information from the municipality as well as the national government. Based on the exploratory analysis these are linked together.

There is also a seventh component, consisting of the seven items that concern the comprehensiveness of information of the source of information. However, all these items received a double loading and almost always loaded significantly higher on one of the other six components. The existence of this seventh component can therefore be doubted. The items are therefore distributed amongst the other components on which they loaded. Consequently, six components emerge for source of information.

Even though table 4.4.4 indicates that the sources of information municipality and government should be joined to form a sub-construct, it becomes clear from analyses that this is not a desirable structure. Validity indicator Cronbach's alpha of the umbrella construct Trust in Information (consisting of different sources of information) will be too low to form an actual construct ($\alpha = 0.53$). In contrast,

the reliability will be satisfactory when the sources of information municipality and national government are distinguished as separate sub-constructs. Therefore the choice is made to still maintain a seven components structure according to source of information.

Reliability analyses are conducted for the seven components. The results show that the Cronbach's alphas lie between 0.84 and 0.88 and are therefore satisfactory. All items contribute to the reliability of each component.

Based on these results a reliability analysis of the construct Trust in Information is conducted. From table 4.4.5 it can be observed that this construct has an acceptable reliability of Cronbach's alpha 0.84. All items contribute to this result. Only the removal of the sub-construct social media, would lead to a slightly higher Cronbach's alpha. However, the improvement is minimal (0.01) and therefore the choice is made to keep this sub-construct.

Table 4.4.5 Reliability and internal consistency Trust in Information

Construct	α	α when item deleted
Trust in information		0.84
Item		
Component information radio and TV (3 items)	0.86	0.80
Component information newspapers (3 items)	0.85	0.81
Component information Internet (3 items)	0.84	0.81
Component information social media (3 items)	0.88	0.85
Component information universities (3 items)	0.87	0.83
Component information municipalities (3 items)	0.87	0.80
	0.87	0.80

Conclusion

Based on the four questions asked about governmental communication in comparison to other sources of information (completeness, comprehensiveness, reliability), it can be concluded that in particular information presented by radio and TV is regarded as valuable. The local and national governments generally scored well on the different aspects, especially reliability. The theory that local sources of information, such as the municipality, are trusted more than relatively distant sources does not appear to hold in the Dutch situation.

Social media achieve the lowest scores on all aspects. People do not seem to consider information coming from these sources as reliable or comprehensive. When looking at the percentages significant differences between age categories are found for completeness and comprehensiveness of information. Respondents up to 36 years old appear to be more positive about social media than older respondents. However, when the reliability of the information provided by social media is taken into account these differences quickly disappear.

Universities too, score relatively low as a source of information. It was expected that people would regard universities as centres of knowledge and therefore would rate the information as reliable and complete. This does, however, not seem to be the case. What is more, it is interesting to see that for these two sources of information a relatively high percentage of the respondents indicate to have 'no opinion'. Perhaps these sources are hardly used in case of disasters. Additionally, universities generally present research data about a disaster only years after it has taken place. Another possibility is that the assessment of information of universities is related to the level of education of the respondents. This assumption is not distinctly supported by the data, regarding the weak to moderate connection that is found between level of education and the assessment of the information provided by universities.

Even though respondents do not rate the government as the most reliable, most comprehensive or most complete source of information, many of them will follow the advice of the government during a disaster. This demonstrates that during a disaster people will still rely on what the government advises them to do.

Finally the exploratory analysis shows that the construct Trust in Information is supported by the data. This construct consists of the seven different sources of information and has a satisfactory reliability of 0.84.

4.4.3 Government capacities

In this paragraph, the focus lies on the trust that people have in the capacities of the government during a disaster. In the Netherlands, several governments and services take part in the preparation for a possible disaster. Municipalities and regional governments are responsible for disaster planning and organising the operational network. The national government sets the framework in which these plans are made (Impact, 2010). In case of a disaster, the municipality where the disaster has taken place has to mobilise the available people, means and knowledge. The national government plays a limited part and mostly offers support by providing financial means and professional knowledge, supervision and showing involvement (Impact, 2010).

The respondents were asked in relation to several services (municipality, national government, fire department, police, ambulance and army) to which extent they think they are prepared for a disaster and to which degree they are able to deal with the possible consequences of a disaster. Based on prior research in Flanders, this is expected to influence the psychosocial resilience of citizens (Maesele *et al.*, 2008). The results will be discussed here.

Degree to which governments and services are prepared

Respondents were asked: 'To which degree do you think the following governments and services are prepared for a disaster?' They could respond on a scale from 1 to 5, where one represents the lowest and five the highest score.

Table 4.4.6 demonstrates that the respondents generally think that operational services are well prepared for a disaster. The fire department, ambulance and police score relatively high with mean scores of respectively 4.18 (0.71), 4.20 (0.73) and 4.10 (0.77). One third of the respondents think that the fire department and the ambulance are completely prepared for a disaster.

Notably, the army attains moderate scores. Internationally and also in the Netherlands, the army often takes part in managing disaster relief, for example by evacuating people or aiding in recovery activities (Dutch national government, 2010; Colten *et al.*, 2010). It was expected that the army would achieve higher scores.

Despite the fact that the municipality and the national government are responsible for disaster planning and management, they receive the lowest scores of the six organisations with mean scores of 3.48 (0.80) and 3.67 (0.78). Ten percent of the respondents think that the national government is completely prepared for a disaster and for municipalities this is only 6 percent. Still, respondents have quite a positive view of governments; about half of the respondents think that both governments are reasonably prepared for a disaster.

Table 4.4.6 Mean score (standard deviation) and response distribution in percentages concerning the degree to which government(al services) are prepared for a disaster on a scale of 1 to 5 when N=1361

Organisation		Mean (SD)	Response distribution in percentages				
			Not at all prepared	A little bit prepared	More or less prepared	Reasonably prepared	Completely prepared
Ambulance	Total	4.20 (0.73)	0.4	1.8	11.3	51.4	35.2
Fire department	Total	4.18 (0.71)	0.3	1.5	11.9	52.8	33.6
Police	Total	4.10 (0.77)	0.4	3.5	14.2	54.5	27.4
Army	Total	3.94 (0.85)	1.4	4.2	18.0	51.4	25.1
National Government	Total	3.67 (0.78)	0.7	6.5	28.0	54.2	10.5
Municipality	Total	3.48 (0.80)	1.0	10.1	34.5	48.2	6.2

When considering the results of the Flemish research from 2005 and comparing them to the present study, it can be seen that the Dutch have quite a bit of trust in the capabilities of the different organisations involved in disaster relief. The Flemish appear to generally trust the army, which obtained the highest mean of 3.44 on a scale of 1 to 5. In contrast to the Dutch, who seem to rely much more on other operational services. Another difference can be found in the lack of trust that the Flemish have in the capacities of the national government and municipalities. Although these also attained the lowest scores in the Netherlands, 27.5 percent of the Flemish think that their national government is (completely) unprepared for a disaster and for the municipalities even 68 percent of the Flemish have this opinion (personal communication Prof.dr. Verleye). Table 4.4.6 shows that only 7.2 percent of the Dutch think that the Dutch national government is not prepared for a disaster and as for municipalities, only 11.1 percent of the Dutch have this opinion.

With respect to the municipality, the national government, the police and the army, it appears that women have a more positive view concerning the degree to which these organisations are prepared, than men. However, the connection is very weak with Cramer's V of 0.16. Also regarding the features age and education, only significantly negligible connections were found with the values $-0.13 \leq \rho \leq 0.10$ for age and $0.06 \leq \rho \leq 0.12$ for education.

Degree to which governments and services are able to handle the consequences of a disaster

Respondents were asked 'To which degree to you think the following governments and services are able to handle the consequences of a disaster?' They could answer on a scale of 1 to 5, where one represents the lowest and five the highest score.

Table 4.4.7 shows that the operational services achieve the highest scores again. The ambulance is regarded as the service that is most able to handle the consequences of a disaster with a mean score of 3.98 (0.72), followed by the fire department 3.97 (0.71) and the army 3.86 (0.79). In case of the ambulance and the fire department, three out of four respondents think that these organisations are (very) well able to handle the consequences of a disaster.

Also in this respect, of all organisations the national government and the municipality receive the lowest scores, in which the national government does score higher with a mean of 3.56 (0.72) than the local government with a score of 3.40 (0.74). Still, about half of the respondents have a positive opinion about the capacities of both governments, rating them as (very) well able to handle the consequences of a disaster.

Table 4.4.7 Mean score (standard deviation) and response distribution in percentages regarding the degree to which government(al services) are able to handle the consequences of a disaster on a scale of 1-5 when N=1361

Organisation		Mean (SD)	Response distribution in percentages				
			Not at all able	Unable	Slightly able	Well able	Very able
Ambulance	Total	3.98 (0.72)	0.4	1.9	19.0	56.5	22.2
Fire department	Total	3.97 (0.71)	0.3	2.0	19.4	57.3	21.0
Army	Total	3.86 (0.79)	1.1	2.8	24.0	53.0	19.1
Police	Total	3.84 (0.75)	0.4	3.4	24.2	55.4	16.6
National Government	Total	3.56 (0.72)	0.7	5.4	38.1	49.6	6.3
Municipality	Total	3.40 (0.74)	0.8	8.0	46.1	40.4	4.6

In general, women seem to have a more positive view on the degree to which the different governments and services are able to handle the consequences of a disaster. However, the connection is weak with a Cramer's V of 0.13. With regard to socio-economic features like age and education there are also no strong connections found.

Exploratory analysis Trust in Government and Auxiliary Services Prepared and Able

Based on the previous supplied response distributions, it is hypothesised that the exploratory analysis will identify two components. One component, in which the trust in the degree to which the government and various services are prepared for a disaster is considered and the second component in which they are expected to be able to handle the consequences of a disaster.

A Principal Components Analysis with Promax rotation was conducted. Table 4.4.8 shows that indeed two components were found, but that they run along different lines than expected, namely along the operational services and the government. The first component consists of eight items that concern the capacities of the operational services - ambulance, fire department, police and army. Additionally the municipality and the national government form a joint component in the analysis. The structure presented in 4.4.8 has an explained variance of 71.67 percent.

Table 4.4.8 Principal Components Analysis with Promax rotation regarding Trust in Government and Auxiliary services Prepared and Able

Item	Component	
	1	2
Degree of ability to handle consequences ambulance	0.98	
Degree of ability to handle consequences fire department	0.93	
Degree of ability to handle consequences police	0.89	
Degree prepared for disaster ambulance	0.83	
Degree of ability to handle consequences army	0.78	
Degree prepared for disaster fire department	0.75	
Degree prepared for disaster police	0.69	
Degree prepared for disaster army	0.56	
Degree prepared for disaster municipality		0.95
Degree prepared for disaster national government		0.86
Degree of ability to handle consequences municipality		0.82
Degree of ability to handle consequences national government		0.75

It is, however, still unclear whether the components that were found form a reliable scale. Therefore a reliability analysis was conducted for both. Concerning the trust in the capabilities of the auxiliary services, the eight items are established to produce a high Cronbach's alpha of 0.94. The reliability of this scale is very satisfactory. Additionally, all items contribute to the value of the alpha.

The reliability analysis that was conducted for the component Government Prepared and Able, signifies that the scale has a satisfactory reliability with a Cronbach's alpha of 0.88. All four items clearly contribute, which can be seen from the fact that the alpha decreases with 0.3 points when one of the items is removed.

The two components Auxiliary Services Prepared and Able, and Government Prepared and Able, are both reliable. It can be stated that the umbrella construct Trust in the Government and Auxiliary services Prepared and Able, consists of two components of respectively eight and four items. This construct has a reliability of 0.80.

Conclusion

Although, for a large part the municipality and the national government are responsible for preparing and management during a possible disaster, respondents are not convinced that the governments are completely prepared, or that they are well able to handle the consequences. The respondents mostly trust operational services: fire department, ambulance and police.

The idea that municipalities and the national government are less prepared or able to handle the consequences of a disaster might be caused by their function as policymakers, which concern covert processes for most people. Respondents are probably hardly aware of the time spent and attention paid by municipalities and ministries to prepare for and guidance during a possible disaster. This is in contrast to the operational services who practice their knowledge and abilities in the view of the respondents on an everyday basis. What is more, during a disaster they are capable of acting in the field by saving lives and keeping order.

For the socio-economic features gender, age and education, there appears to be no significant connection with the assessments made of the government's capacities.

The exploratory analysis demonstrated that the data supports an umbrella construct Trust in Government and Auxiliary services Prepared and Able. This consists of two constructs Trust in Government Prepared and Able and Auxiliary services Prepared and Able and has a reliability of Cronbach's alpha 0.80.

4.4.4 Trust in Government and information

In the previous paragraphs it was established that the data supports a construct Trust in Information, and Trust in Government and Auxiliary services Prepared and Able. It is expected that they form an umbrella construct together.

Exploratory analysis Government and Information

To establish whether an umbrella construct actually exists, a Principal Components Analysis with Promax rotation is administered. The scale values of the found sub-constructs are used as a basis. The results of the analysis displayed in table 4.4.9 present a picture that is difficult to interpret. The first component seems to consist of governmental aspects, but also includes two information aspects. Information of social media and Internet form a separate construct together and information of newspapers receives a double loading. The hypothesis that a clear distinction between Trust in Information and Trust in Auxiliary services and Government Prepared and Able would be reflected in a meta-construct is not confirmed.

Table 4.4.9 Principal Components Analysis with Promax rotation concerning meta-construct Trust in Government and Information

Item	Component	
	1	2
Component information national government (3 items; alpha 0.87)	0.90	
Component information municipality (3 items; alpha 0.87)	0.85	
Component municipality and national government prepared and able (4 items; alpha 0.88)	0.85	
Component auxiliary services prepared and able (8 items; alpha 0.94)	0.80	
Component information radio and TV (3 items; alpha 0.86)	0.60	
Component information universities (3 items; alpha 0.87)	0.45	
Component information social media (3 items; alpha 0.88)		0.92
Component information Internet (3 items; alpha 0.84)		0.86
Component information newspapers (3 items; alpha 0.85)	0.41	0.46

However, when a reliability test is conducted for all the different components together, it appears that the Cronbach's alpha of an umbrella construct is valid with a value of 0.86. The alpha increases when the sub-construct Information social media is removed. However, it concerns a minimal increase of 0.01 point. Furthermore, the advisory board attached value to this source of information because it is a popular means of communication. Therefore we chose to keep Information social media included in the meta-construct Trust in Government and Information.

The data support the existence of a meta-construct Trust in Government and Information. This construct, with an alpha of 0.86 consists of nine components and 33 items.

4.4.5 Conclusion

Trust in Government and Information consists of nine sub-constructs and has a reliability of 0.86. The nine sub-constructs can be divided into two constructs: Trust in Information and Trust in Government and Auxiliary services Prepared and Able. The first construct concerns the reliability, completeness and comprehensiveness of seven sources of information. The second construct focuses on the extent to which citizens think that the government and auxiliary services are prepared for a disaster and are able to handle the consequences of a disaster.

Table 4.4.10 provides an overview of the composition of this meta-construct and accompanying number of items and different reliabilities.

Table 4.4.10 Trust in government and information components and the accompanying items and alpha values

Construct	Component	Number of items	α
Trust in information		21	0.84
	Trust in radio and TV	3	0.86
	Trust in newspapers	3	0.85
	Trust in Internet (general)	3	0.84
	Trust in social media	3	0.88
	Trust in municipality	3	0.87
	Trust in national government	3	0.87
	Trust in universities	3	
Trust in Government and Auxiliary services Prepared and Able		12	0.88
	Trust in auxiliary services prepared and able	8	0.94
	Trust in government prepared and able	4	0.88
Trust in Government and information		33	0.86

4.5 Impact and behaviour in scenarios

4.5.1 Introduction

In the previous chapters questions were discussed concerning various aspects of psychosocial resilience. Amongst other things, a central question was to which extent people think that the government is prepared for and capable of handling the consequences of a disaster. To be able to handle a crisis or disaster adequately, the government is also partly dependent on the way in which the community will behave; for example, are people prepared to evacuate, will there be social unrest, will groups of the population come to oppose each other in a conflict, will citizens follow the advice of the government?

This chapter focuses on the behaviour respondents think they will display in case of a disaster. Attention is paid to avoidance behaviour, following the advice of the government and gathering as much information as possible. Avoidance behaviour indicates whether people will adapt their geographical and/or social behaviour after a disaster and will be guided by this. This can result in shifts in society, such as stigmatising certain groups of people (Lemeyre *et al.*, 2005; MacFarlane & Norris, 2006). In previous chapters it has been described that gathering as much information as possible from sources other than the government causes people to have a higher risk of developing psychosocial complaints after a disaster (Maesele *et al.*, 2008).

In total, three scenarios are described in which three different kinds of disasters are discussed: natural, intentionally caused by humans and unintentionally caused by humans. This choice was made because, based on the literature it is expected that the behaviour and the impact is different according to the kind of disaster (Norris *et al.*, 2002).

In the first three paragraphs of this chapter the results of the three scenarios will be described. In succession, it concerns a flu pandemic, a terrorist attack and a bridge collapse. People were asked about the extent to which the three described disasters affected them. This is discussed in 4.5.5. Consequently, the possibility of a meta-construct Impact and Behaviour is examined. For this reason, several exploratory analyses were conducted which are presented and analysed in 4.5.6. Finally the conclusion describes whether and how this meta-construct can take shape.

4.5.2 Flu

Scenario

A serious, contagious flu outbreak is spreading across Europe. Many countries, amongst which Germany, Belgium, France and Austria, announce that an increasing number of people have been infected by the flu. In those countries, some people have also died from the flu, primarily adults above 65 years of age. The flu is also found in the Netherlands and has caused 350 infections in a period of three months. Nobody has died from the flu yet. No vaccine is available. The government advises people to thoroughly wash their hands and to avoid physical contact with infected people where possible in order to stop the flu from spreading.

Response distribution

In relation to the flu scenario, three statements are presented regarding avoidance behaviour, taking the advice of the government and gathering as much information as possible. Respondents could respond on a scale of 1 to 5, where 1 had the lowest value and 5 the highest.

Table 4.5.1 displays the reactions on the different statements. It is demonstrated that following the procedure advised by the government in the scenario scores highest with a mean of 4.01 (0.83). Eighty percent of the respondents indicate to (completely) agree with this statement. This correlates with the results found in 4.4.1 Trust in information. For this aspect 84.5 percent indicated to always or mostly take the advice of the government during a disaster. Furthermore, a vast majority of the respondents (64.9 percent) will gather as much information about the flu as possible. Only 10.5 percent of the respondents would not do this. On this item a mean score of 3.75 (0.96) was attained.

Avoiding contact with all people who possibly have been infected by the flu appears to be an unpopular action. This item is rated the lowest mean score of 3.19 (0.99). A relatively large percentage of the respondents disagree or completely disagree with this statement (36 percent). Perhaps many respondents doubt whether they would avoid people who might be infected by the flu during a real flu pandemic.

Table 4.5.1 Mean score (standard deviation) and response distribution of the flu scenario on a scale of 1 to 5 where N= 1361

Item	Mean (SD)	Response distribution in percentages				
		Completely disagree	Disagree	Neither disagree nor agree	Agree	Completely agree
I will follow the procedure advised by the government to not become infected	4.07 (0.83)	0.9	4.6	11.7	52.0	30.8
I will gather as much information as possible regarding this flu	3.75 (0.96)	1.9	8.6	24.6	42.7	22.2
I will avoid all contact with people who are possibly infected	3.19 (0.99)	3.5	21.9	36.0	29.2	9.4

There appears to be no significant connection between various socio-economic factors such as gender, age and education and the different kinds of actions.

4.5.3 Terrorist bomb attack

Scenario

On a busy Saturday afternoon in a shopping centre in Rotterdam a bomb attack is committed. Miraculously no one is killed, but 220 people are injured and many of them are severely injured. 38 people are in the hospital in critical condition. Shortly after the attack, it is claimed by the right-wing extremist group 'Dutch First'. They warn that more attacks will be committed if the government does not take serious measurements against, what they call, 'the flooding of the Netherlands by immigrants'. The government announces that they will not give in to the pressure of the terrorists and promises to find the attackers and to imprison them. The Dutch community is asked to continue their normal daily lives and to be extra alert on suspect behaviour.

For the second scenario a terrorist attack by a right-wing extremist group was chosen. Also in this case, questions were asked about possible avoidance behaviour, the extent to which advice is taken from the government (in this case the advice to be extra alert in public places) and searching for information.

Response distribution

Once more, the respondents were presented with three questions regarding taking the advice of the government, avoidance behaviour and gathering information. They could answer on a scale of 1 to 5, where 1 was the lowest and 5 the highest value.

From table 4.5.2 it can be seen that also in this case the highest score is attributed to taking the advice of the government with a mean of 3.48. Half of the respondents (completely) agree with this statement. Avoiding public places attains the lowest score (mean is 2.83). Notably, the reactions of the respondents are divided. Almost 40 percent does not agree (at all) with this statement and would not avoid public places because of the attack. On the other hand 46.1 percent agree (completely) with this statement. This means that almost half of the respondents would adapt his or her (geographic) behaviour.

With regard to gathering as much information as possible, 44.4 percent indicate that they (completely) agree with this statement. About one fifth of the respondents say they do not agree (at all) and will not gather as much information as possible. When comparing this to the Flemish research from 2005, it appears that the Dutch are much more inclined to search for information. Of the Flemish, 57 percent had indicated they would not search for information, against 20 percent of the Dutch. Additionally, only 16.1 percent of the Flemish would (certainly) do this (personal communication with Prof. dr. G. Verleye), while 40% of the Dutch respondents (completely) agree with this statement.

This may mean that the Dutch have a greater need for information and prefer to be well-informed as much as possible. On the other hand, in the Flemish study the example that is used regards 'an attack', it does not necessarily have to take place in Belgium. This can make a considerable difference. An attack in a foreign country can have a relatively distant feel to people, perhaps causing them to be less interested than when it would happen in their own country.

In general, women seem to be more inclined to avoid public places and to be extra alert in public than men. However, the connection between gender and the actions taken after a terrorist attack is weak. For other socio-economic factors no strong statistic connection was found either.

Table 4.5.2 Mean score and response distribution in percentages for attack scenario where N= 1361

Item	Mean (SD)	Response distribution in percentages				
		Completely disagree	Disagree	Neither disagree nor agree	Agree	Completely agree
I pay extra attention to suspect people and bags in the street	3.48 (0.91)	2.5	11.8	30.9	44.8	10.1
I gather as much information as possible in relation to this attack	3.30 (0.99)	3.9	16.7	35.0	34.0	10.4
I avoid public places	2.83 (1.02)	8.4	30.9	34.6	21.0	25.1

4.5.4 Collapse Nieuwe IJsselbrug

Scenario

On the motorway A28, on a weekday before the afternoon rush hour, a part of the *Nieuwe IJsselbrug* in the direction of Meppel has collapsed. The damage is enormous. At the time of the accident about 50 cars were driving on one half of the bridge. Some of them have fallen into the water. Quickly it becomes clear that there are many victims. Eight people have died, 62 people are injured and many of them are severely injured. Twelve people are in the hospital in critical condition. Although much is unclear about the cause of the collapse, it is quickly established to be carbonation. After examination in the two weeks following the accident, the Research Council for Safety establishes that the collapse was indeed caused by carbonation. It appears that negligent maintenance of the bridge has led to carbonation. There is much unrest in society caused by this news: which other places involve negligent maintenance and how likely is it that another disaster like this will happen again? The government starts a large-scale investigation.

Response distribution

Table 4.5.3 shows that a vast majority (60.4%) would not avoid bridges, viaducts or tunnels after this kind of accident. Less than 10 percent would do this. This shows that people will not adjust their normal (geographical) behaviour according to the circumstances. Even the possible insecurity about the quality of bridges in the country, seemingly does not affect this.

Respondents would actively search for information. No less than 41.4 percent indicated to (completely) agree with this statement. On the other hand, more than half would not look for additional information.

Table 4.5.3 Mean score and response distribution in percentages concerning bridge collapse scenario when N= 1361

Item	Mean (SD)	Response distribution in percentages				
		Completely disagree	Disagree	Neither disagree not agree	Agree	Completely agree
I collect as much information as possible regarding this collapse	3.12 (1.04)	5.4	21.5	31.7	32.4	9.0
I avoid as many bridges, viaducts and tunnels as possible	2.35 (0.92)	17.0	43.4	29.5	7.9	2.1

An attempt was made to find a connection between gender and both items. Even though women seem to be more likely to avoid bridges and other infrastructural constructs and gather information to a greater extent, the data does not support a connection between gender and both actions. Moreover, such a connection is not found for the socio-economic factors age and education either.

4.5.5 Impact of the three different scenarios

Literature shows that the kind of disaster influences the degree of psychosocial complaints experienced by people. People, who have been exposed to large-scale violence, are more likely to develop complaints than people who have been through a natural disaster (Norris *et al.*, 2002). Therefore, in this study the choice was made to ask the respondents to which extent they would be affected by each disaster.

Table 4.5.4 shows that the terrorist attack scores the highest with a mean score of 3.64 on a scale of 1 to 5. Half of the respondents indicate that this kind of disaster would affect them (greatly). In case of the flu, which attains the lowest score of the three potential disasters, this is almost one third. For each kind of disaster, a relatively small percentage of the respondents indicate they would not be affected (at all): around 10 percent.

These results correlate with what was previously found by Norris *et al.* (2002) and appear to confirm the expectation that disasters involving a certain form of human action or failure have a greater negative impact.

Table 4.5.5 Mean score and response distribution in percentages concerning the impact of the three scenarios on a scale of 1-5 when N=1361

Item	Mean (SD)	Response distribution in percentages				
		Not affecting at all	Not affecting	Not very affecting	Affecting	Very affecting
Attack	3.64 (0.86)	1.4	5.9	33.5	45.8	13.4
Bridge collapse	3.45 (0.74)	2.5	8.7	38.8	41.4	8.6
Flu	3.24 (0.84)	2.0	8.7	56.3	29.5	3.5

Reliability analysis

Based on the reliability analysis it can be determined which constructs are found according to the kind of disaster. This would be in line with the literature (Norris *et al.*, 2002).

For each of the scenarios an analysis was conducted. The flu- and attack scenarios each consist of four items that relate to avoidance behaviour, taking advice from the government, searching for information and the degree to which people are affected by the disaster. The bridge collapse scenario includes three items; in this case the governmental advice is not included.

The usability analysis demonstrates that the Cronbach's alpha values for all three of the components are acceptable with 0.72 (flu), 0.75 (attack) and 0.66 (bridge collapse). Furthermore all items contribute to the respective sub-construct. Based on this data it can be concluded that, in line with the literature, components can be formed according to the kind of disaster.

4.5.6 Exploratory components analysis

With regard to the results described in the previous paragraphs, in this paragraph a Principal Components Analysis is conducted to examine whether a meta-construct exists for Impact and Behaviour related to the scenarios. Based on the previously conducted reliability analyses, it is expected that components according to the kind of disaster will emerge from the exploratory analysis.

Table 4.5.5 Principal Components Analysis with Promax rotation concerning Impact and Behaviour

Item	Component		
	1	2	3
I gather as much information as possible concerning this attack	0.95		
I gather as much information as possible concerning this collapse	0.90		
I gather as much information as possible concerning this flu	0.66		
I pay extra attention to people and bags in the street	0.53		
I avoid public places	0.38		
Assessment of the impact of the bridge collapse		0.90	
Assessment of the impact of the attack		0.87	
I avoid bridges, viaducts and tunnels as much as possible		0.43	
I avoid all contact with people who might be infected by the flu			0.86
I follow the advised procedures by the government in order to not become infected			0.83
Assessment of the impact of the flu		0.42	0.54

The results presented in table 4.5.5 provide a scattered image that is difficult to interpret. The information items seem to form a joint construct, but the item 'I pay attention to suspect people and bags in the street' should also be included. Furthermore, the item 'I avoid public places' does not load on any component and the item 'Assessment of the impact of the flu' has a double loading.

The analysis does not show constructs according to the different kinds of disasters. It is possible that the components do exist but according to the different actions. A reliability analysis in this respect clearly shows that the Cronbach's alpha values of respectively 0.66 (avoidance), 0.52 (taking advice), 0.82 (searching for information) and 0.74 (impact) are higher than the values of the previous analyses. The construct Taking advice is an exception, with an alpha of 0.52, which is not acceptable. The alpha of Avoidance is not satisfactory either. An alternative for these two constructs could be to combine the two into Adapting Behaviour. This leads to an alpha of 0.75.

4.5.7 Conclusion

In this chapter an attempt was made to establish a meta-construct Impact and Behaviour. Based on the literature, it was expected that components would be determined according to kind of disaster.

Although the reliability analyses of the possible constructs show satisfactory alpha values, the Principal Components Analysis did not support this expectation. A possible alternative is to divide the components according to the kind of behaviour. New reliability analyses indicate that the reliabilities of these constructs are higher than those arranged according to the kind of disaster. Based on this arrangement, the meta-construct Impact and Behaviour with regard to the scenarios also has a high alpha of 0.74.

The data support the idea of a meta-construct Impact and Behaviour based on the scenarios. Table 4.5.6 provides an overview of the composition of this construct.

Table 4.5.6 Composition meta-construct Impact and Behaviour

Component	Number of items	α
Searching for information	3	0.82
Adapting behaviour	5	0.75
Affecting	3	0.74
Impact and Behaviour	11	0.74

4.6 Factual knowledge

4.6.1 Introduction

In this paragraph, respondents are tested on their factual knowledge about disasters by means of multiple-choice questions. Based on a similar study conducted in Flanders, Belgium in 2005, it is expected that the more factual knowledge people have about disasters the more resilience they will show (Maesele *et al.*, 2008).

Firstly, the manner in which respondents answered will be discussed, after which the focus lies on a possible connection between factual knowledge, several socio-economic features and characteristics of resilience. Finally, various conclusions will be drawn.

4.6.2 Level of knowledge of the respondents

Response distribution

Table 4.6.1 shows the number of respondents who have chosen the right answer per question. It can be seen that the questions relating to events in the Netherlands and events that have been frequently on the news and are regularly referred to (9/11, Katrina) were answered correctly. The question that was answered correctly most frequently was: 'Where did the fireworks disaster take place?' As much as 99.1% chose the answer Enschede. In contrast, questions involving events that have taken place relatively long ago or referred to a specific year, were answered incorrectly. The question that was answered incorrectly most frequently was 'In which year did the attacks on the London underground and bus take place?' Three quarters of the respondents did not know that this happened in 2005. It seems that people mostly remember factual knowledge about events in their own country and particular circumstances of both national and international disasters. As soon as questions are asked about figures, a relatively large number of people do not know the correct answer.

Table 4.6.1 Correct-incorrect percentage per question

Question	Answer	Correct or incorrect percentages	
		Correct	Incorrect
A pandemic flu happens once every 100 years	False	47.5	52.5
A pandemic flu can only break out in autumn	False	82.1	17.9
In which year did the last dike break in the Netherlands take place?	2003	23.9	76.1
The <i>Oosterscheldekering</i> is situated in South-Holland	False	73.2	26.8
In which year did the tsunami in Asia take place?	2004	30.1	69.9
Which city was heavily damaged by Hurricane Katrina?	New Orleans	86.4	13.6
200.000 people were killed due to the earthquake in Haiti in January 2010	True	41.7	58.3
How many airplanes were crashed into the Twin Towers on 11 September 2001?	2	94.1	5.9
What is the name of the memorial sign where the attack of Queen's day 2009 took place?	The Needle	92.6	7.4
In which year did the attacks on the London subway and bus take place?	2005	20.9	79.1
Where did the assassination of Pim Fortuyn take place?	Hilversum	89.6	10.4
Is the IRA a protestant opposition wing?	False	42.0	58.0
Afghanistan was invaded in order to take down the regime of Bin Laden	False	49.7	50.3
The attacks of March 2004 on the underground of Madrid. Spain were claimed by ETA	False	40.6	59.4
Which cargo aircraft crashed in de Bijlmer?	Boeing	30.2	69.8
Where did the fireworks disaster take place?	Enschede	99.1	0.9
During an electricity network shutdown in the Bommeler&Tielerswaard more than 40.000 households were without electricity	True	56.4	43.6
How many nuclear power reactors are there in the Netherlands?	1	35.4	64.6
When was the fire in the café in Volendam?	2001	48.7	51.3
A chemical disaster can lead to serious physical problems many years after exposure	True	96.4	3.6
How long does an average electricity network shutdown last?	1-2 hours	25.6	74.4

Each correct answer was awarded 1 point, an incorrect answer received no points. The maximum amount of points that could be obtained was 21. In general, people possess quite a high level of factual knowledge. Three quarter of the respondents (76.3%) obtained 10 points or more and a quarter (25.5%) obtained 15 or more points. The mean score on factual knowledge was 12.46 points with a standard deviation of 2.89. In the Belgian study, which has also been mentioned in the previous chapters, the Flemish obtained a mean score of 6.5 (2.33) on a scale of 0 to 17. When both results are converted to a five-point scale, the Dutch score higher on factual knowledge with a mean score of 2.96 than the Flemish with a mean of 1.91. It is important to note that not all questions in these studies were similar.

Socio-economic factors and factual knowledge

For a few socio-economic factors, it was examined whether there was a connection to factual knowledge. Firstly, it appears that men obtain higher mean scores than women with a mean score of 13.22 points (2.78). Women obtained a mean score of 11.76 points (2.82). An independent t-test indicates that there is a significant difference between men and women with $p < 0.05$, where men have more factual knowledge than women. The connection is weak with a Pearson's r of 0.25.

The data demonstrate that the level of factual knowledge about disasters increases with age. Respondents in the category 56+ scored a mean of 12.98 points (2.75). In contrast, younger people in the age of 16-30 years and adults in the category 31-55 years obtained mean scores of 11.32 (3.22) and 12.53 (2.75) respectively. A strong statistical connection was not found. A possible explanation for the high scores on factual knowledge by people in the older age category could be that many questions involve events that have taken place between five and ten years ago. Respondents who are between the 16-30 years old were probably too young at the time of the disasters to remember certain information.

Furthermore, the data indicate a difference between high, average and low education levels. Respondents with a higher education level scored a mean of 13.00 points (2.89), while those with an average and lower education level obtained a mean of 11.95 (2.74) and 11.53 (3.01) points. This indicates that the higher one's level of education, the more factual knowledge one possesses. The statistical connection is not strong with a Pearson's r of 0.20.

Finally, a possible connection between the degree of factual knowledge and various aspects of resilience, such as the *RS-NL* and *Social Optimism* was examined. For these aspects there does not appear to be a strong significant connection either.

4.6.3 Conclusion

In general, relatively high scores were obtained on the factual knowledge questions with a mean of 12.46 (2.89). There appears to be a significant statistical connection between factual knowledge and gender and factual knowledge and education. Men and higher educated people obtained higher scores.

An important aspect that has to be mentioned is that when making the questions, careful attention should be paid to the currency of affairs: to which extent are 'correct answers' disputed? The current study has fallen into this trap by including the question regarding the number of people killed during the earthquake in Haiti. When the questionnaire was made, the official number was established above 200,000 and also according to OCHA (the UN-office for coordination of humanitarian aid) more than 200,000 losses were mourned (HaitiNU, 2010). At the time of writing, this number is disputed.

4.7 Summary results chapter 4

In chapter 4, the results of the questionnaire on the different aspects, Psychological Resilience (§4.2), Social Context (§4.3), Trust in Government and Information (§4.4), Impact and Behaviour (§4.5) and Factual Knowledge (§4.6) are presented. In this final paragraph the most significant conclusions will be summarised once more.

First of all, a great number of socio-economic factors from the sample survey can be considered representative of the Dutch population. Exceptions are education, income, religiousness and ethnicity. In the first two cases, people with high education levels and higher incomes are overrepresented in the current sample survey. For religion and ethnicity, there appears to be an overrepresentation of respectively non-religious and autochthonous people in the survey.

Secondly, from the results it becomes clear that, at the moment, the Dutch are satisfied with their social context and think that they could recover well from a disaster or crisis. Based on the results of the exploratory analyses in 4.2 and 4.3 it can be observed that the construct Psychological Resilience consists of three sub-constructs: Personal Competence, Value Self and Life, and Coping with Difficult Circumstances. These sub-constructs involve several individual characteristics. Additionally it appears that the construct Social Context also consists of three sub-constructs: Social Support, Community Involvement and Attachment to Place.

Thirdly, it is demonstrated that the Dutch are satisfied with the communication of the government and also trust the government's capacities in relation to disaster or crises management. In comparison to the results of the Flemish research from 2005, the Dutch local and national governments achieve high scores. Classic sources of information and operational services are considered more reliable. It is interesting to see that Dutch people have (very) little trust in the completeness and comprehensiveness of social media. In this context, there does seem to be a difference between older and younger generations. Respondents up to 36 years of age have more trust in the completeness and comprehensiveness of social media than the other respondents. That being said, the difference between generations with regard to reliability of information of social media is small. The umbrella construct, Trust in Government and Information, is reliable and consists of two constructs: Trust in Information, and Trust in Government and Auxiliary services Prepared and Able.

Fourthly, from the result of 4.5 it becomes clear that Dutch people would take the advice of the government during a disaster, but would also search for information on their own. From the literature search it was expected that behaviour would be different for each kind of disaster, but this was not the case.

A construct for Impact and Behaviour can be formed based on the different kinds of actions, Searching for Information, Adapting Behaviour and the degree to which people are affected by a disaster.

The section Factual Knowledge consists of 21 questions that focus on natural, technological and man made disasters on a national and international level. In general, a high percentage of the respondents answered the knowledge questions correctly, especially concerning national disasters and (international) crises where questions were aimed at factual circumstances.

Finally, it appears that there are no connections between socio-economic factors such as gender, age and education and the separate constructs.

5. Testing of the internal correlation between concepts

5.1 Introduction

In this chapter, the focus lies on the internal correlation between the constructs previously described. This is done through *structural equation modelling* (SEM). These models are used to validate whether a predetermined theoretical model can explain the correlations between observed variables. It is also possible to determine the presence of non-observed variables.

In this chapter, based on the previously described variables and validated constructs, two hypothetical models are tested in which it will be examined whether one meta-construct Psychosocial Resilience can be established or only two sub-constructs Psychological Resilience and Social Context. These models and the accompanying results are explained in paragraph 5.2. Subsequently, in paragraph 5.3 these models are extended with three other constructs Trust in Government and Information, Impact and Behaviour and Factual Knowledge. A comparison of the results of the SEM analyses is discussed in paragraph 5.4. Paragraph 5.5 offers an overview of the most significant conclusions.

5.2 Psychological resilience vs. Psychosocial resilience

In the introduction the objective of this research is stated to be amongst other things, developing a measuring tool for *psychosocial resilience*. In chapter 4, the components Psychological Resilience and Social Context are still kept separate. This paragraph describes whether they can form Psychosocial Resilience. To do this, two hypothetical models will be tested. The Model i-a is based on one meta-construct Psychosocial resilience. Model ii-a is the counterpart and keeps the two constructs Psychosocial Resilience and Social Context separate from each other. Both models present a way to examine the psychosocial interaction between different aspects of psychological resilience and elements surrounding the individual's social context.

Model i-a: psychosocial resilience general

The first model to be tested is Model i-a. In this model, the focus lies exclusively on the degree to which Social Optimism, Social Support, Attachment to Place, Personal Competence, Coping with Difficult Circumstances, and Value of Self and Life, are part of one meta-construct (see the hypothetical model in figure 5.1). The reliability analysis from 4.2 emphasises the assumption that this is the case (Cronbach's alpha is 0.77).

Figure 5.1 Hypothetical Model i-a

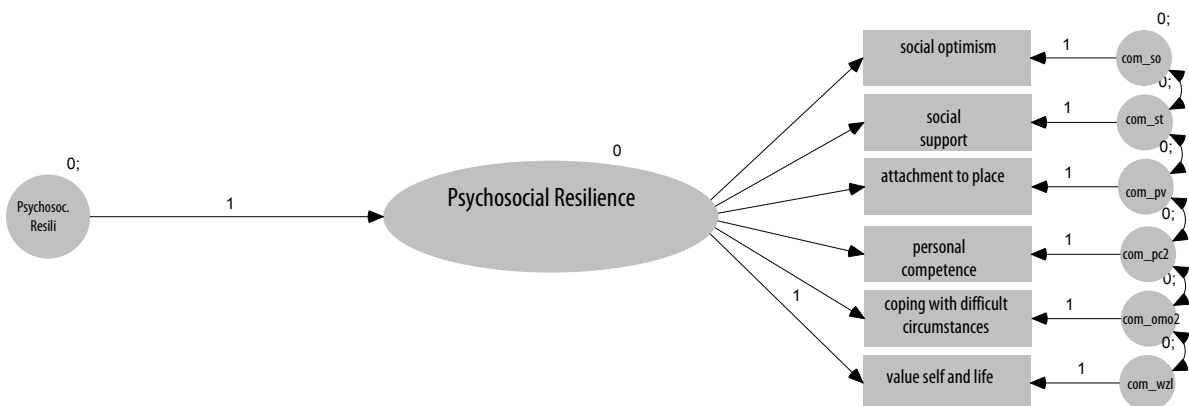


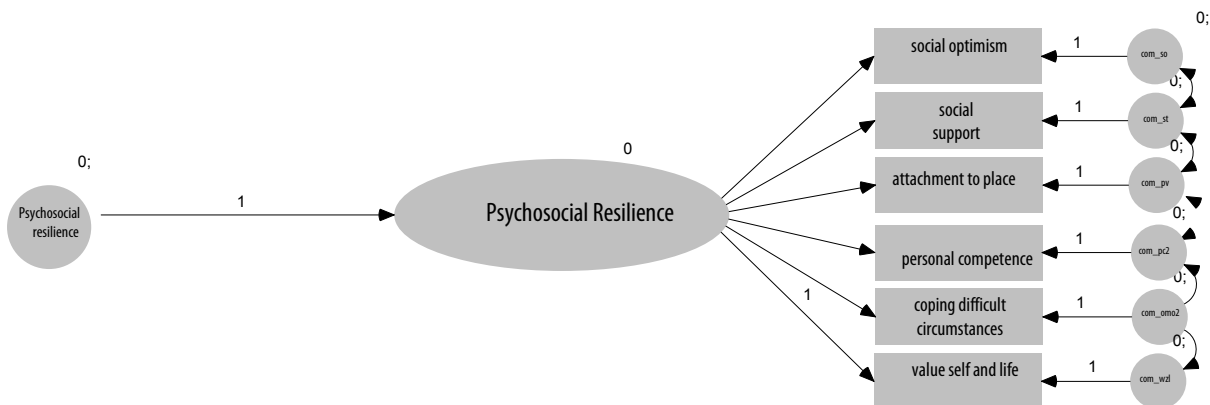
Table 5.1 Results hypothetical model i-a

			Estimation	Standard. estimation	S.E.	P
<i>Regression</i>						
com_wzl	<---	psychosocial resilience	1.000	0.819		
com_pc2	<---	psychosocial resilience	0.607	0.652	0.037	***
com_omo2	<---	psychosocial resilience	0.610	0.587	0.037	***
com_so	<---	psychosocial resilience	0.592	0.568	0.038	***
com_st	<---	psychosocial resilience	0.428	0.368	0.039	***
com_pv	<---	psychosocial resilience	0.288	0.326	0.030	***
<i>Model-fit</i>						
Chi-square			53.756 (degrees of freedom: 4)			
NFI			0.978			
TLI			0.893			
CFI			0.980			
RMSEA			0.096 (0.074-0.119; PCLOSE 0.000)			

* P<0.05 ** P<0.01 *** P<0.001 S.E. = standard error

In table 5.1, the SEM results of this model are presented. Notably, Attachment to place only has a slight loading on the meta-construct (<0.40). It does not seem to be a part of it. Furthermore, the association between Attachment to place and Personal Competence is not significant ($P>0.05$)⁵ and what is more, the model-fit values TLI and the RMSEA are too low (<0.95 respectively >0.05). These model-fit values indicate the extent to which a theoretical model is supported by the data. The model is tested again without the non-significant relationship between Personal Competence and Attachment to Place (see figure 5.2).

Figure 5.2 Model i-a without non-significant relationships



This additional test demonstrates that the fit-measures TLI and RMSEA are improved, but still do not reach the target values. The theoretical model with a meta-construct Psychosocial Resilience is not supported by the data.

⁵ Complete SEM-tables are available upon request with the first author

Table 5.2 Results model i-a without non-significant relationships

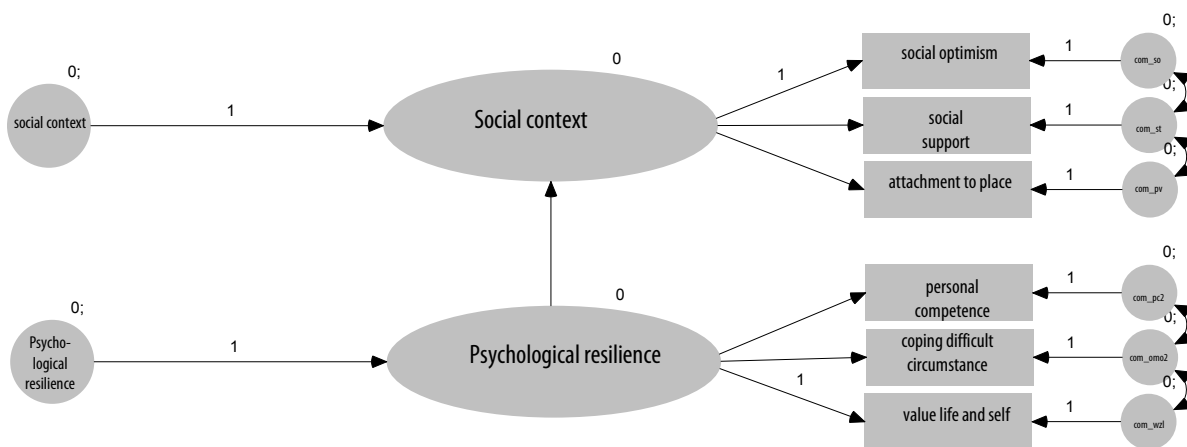
			Estimation	Standard. estimation	S.E.	P
<i>Regression</i>						
com_wzl	<---	psychosocial resilience	1.000	0.826		
com_pc2	<---	psychosocial resilience	0.598	0.647	0.036	***
com_omo2	<---	psychosocial resilience	0.611	0.593	0.037	***
com_so	<---	psychosocial resilience	0.584	0.565	0.037	***
com_st	<---	psychosocial resilience	0.424	0.367	0.039	***
com_pv	<---	psychosocial resilience	0.278	0.317	0.028	***
<i>Model-fit</i>						
Chi-square			54.414 (degrees of freedom: 5)			
NFI			0.978			
TLI			0.915			
CFI			0.980			
RMSEA			0.085 (0.066-0.106; PCLOSE 0.002)			

* P<0.05 ** P<0.01 *** P<0.001 S.E. = standard error

Model ii-a: psychological resilience and social context general

The second general model is based on two separate sub-constructs Psychological Resilience (consisting of Personal Competence, Coping with Difficult Circumstances, and Value of Self and Life; Cronbach's alpha 0.81) and Social Context (consisting of Social Optimism, Social Support and Attachment to Place; Cronbach's alpha 0.66). It is expected that they will correlate positively (see figure 5.3).

Figure 5.3 Hypothetical model ii-a⁶



The results of the SEM analysis can be found in table 5.3. All relations appear to be significant. As soon as Psychosocial Resilience increases with 1, Social Context also increases with 0.53. The correlation between both constructs is 0.71 (P<0.001). Model-fit values are high. The hypothetical models fit the data well.

⁶ Please note: the positive correlation in these and other figures in this chapter implies causation. Testing a direction only indicates that the increase of a variable runs parallel with the increase of another variable. This effect could just as well be valid the other way around.

Table 5.3 Results hypothetical model ii-a

			Estimation	Standard. Estimation	S.E.	P
<i>Regression</i>						
Social context	<---	psychological resilience	0.534	0.710	0.038	***
com_wzl	<---	psychological resilience	1.000	0.858		
com_pc2	<---	psychological resilience	0.567	0.637	0.038	***
com_omo2	<---	psychological resilience	0.603	0.606	0.039	***
com_so	<---	social context	1.000	0.756		
com_st	<---	social context	0.726	0.486	0.057	***
com_pv	<---	social context	0.439	0.391	0.048	***
<i>Model-fit</i>						
Chi-square		16.684 (degrees of freedom: 4)				
NFI		0.993				
TLI		0.973				
CFI		0.995				
RMSEA		0.048 (0.026-0.073; PCLOSE 0.497)				

* P<0.05 ** P<0.01 *** P<0.001 S.E. = standard error

5.3 Trust in Government and Information, Impact and Behaviour, Factual Knowledge

In the previous paragraph, the correlation between the two constructs concerning resilience in the general sense was tested. The following paragraphs discuss the two remaining constructs that regard the specific disaster context: Trust in Government and Information, and Impact and Behaviour. Their possible connection to resilience is tested in two different models. Model i-b is based on psychosocial resilience as one meta-construct and Model ii-b estimates according to two separate sub-constructs Psychological Resilience and Social Context. The choice was made to not include the construct Factual Knowledge in these analyses. From the calculations it becomes evident that this construct only shows a very weak correlation to Impact and Behaviour.

Model i-b: psychosocial resilience in relation to Trust in Government and Information, and Impact and Behaviour

Model i-b is a variant of the general model in which psychosocial resilience is considered to be one meta-construct, but to which two disaster related constructs have been added: Trust in Government and Information and Impact and Behaviour. It is assumed that Psychosocial Resilience is positively related to both. Furthermore, it is expected that these two constructs are positively correlated to each other (see figure 5.4). When looking at the results in table 5.4, it appears that three associations are non-significant: the association between the sub-constructs of Impact and Behaviour, and between the degree to which Auxiliary services are considered Prepared and Able and Information municipality. The TLI-value scores just below the marginal value (<0.95). The validity of this hypothetical model can therefore be disputed.

Figure 5.4 Hypothetical model i-b

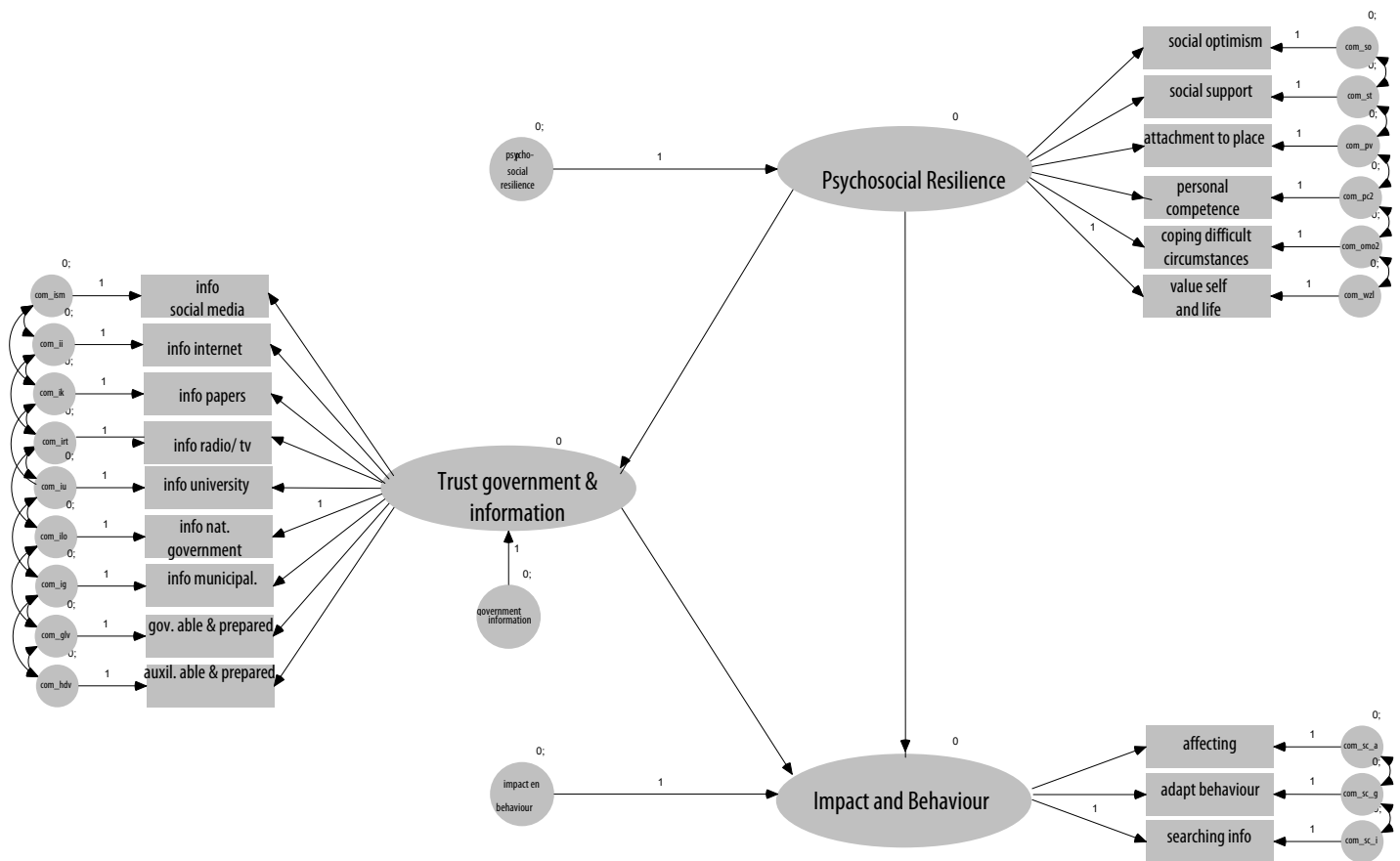


Table 5.4 Results hypothetical model i-b

		Estimation	Standard. estimation	S.E.	P	
<i>Regression</i>						
government and information	<---	psychosocial resilience	0.284	0.325	0.034	***
impact and behaviour	<---	government and information	0.462	0.318	0.062	***
impact and behaviour	<---	psychosocial resilience	0.141	0.111	0.049	**
<i>Model-fit</i>						
Chi-square		458.899 (degrees of freedom: 110)				
NFI		0.953				
TLI		0.943				
CFI		0.964				
RMSEA		0.048 (0.044-0.053; PCLOSE 0.723)				

* P<0.05 ** P<0.01 *** P<0.001 S.E. = standard error

In addition to this test the model is tested again without the non-significant relationships (figure 5.5). The data in table 5.5 illustrates that an increase of Psychosocial Resilience of 1 leads to an increase in Trust in Government and Information of 4.1 and an increase of Impact and Behaviour of 0.15. An increase in Trust and Government and Information of 1 leads to an increase of Impact and Behaviour of 0.36. In the additional test, the scores on the fit measures appear to increase only slightly. The TLI

remains below the preferred value (<0.95). This model does not appear to be supported by the present data either.

Figure 5.5 Model i-b without non-significant connections

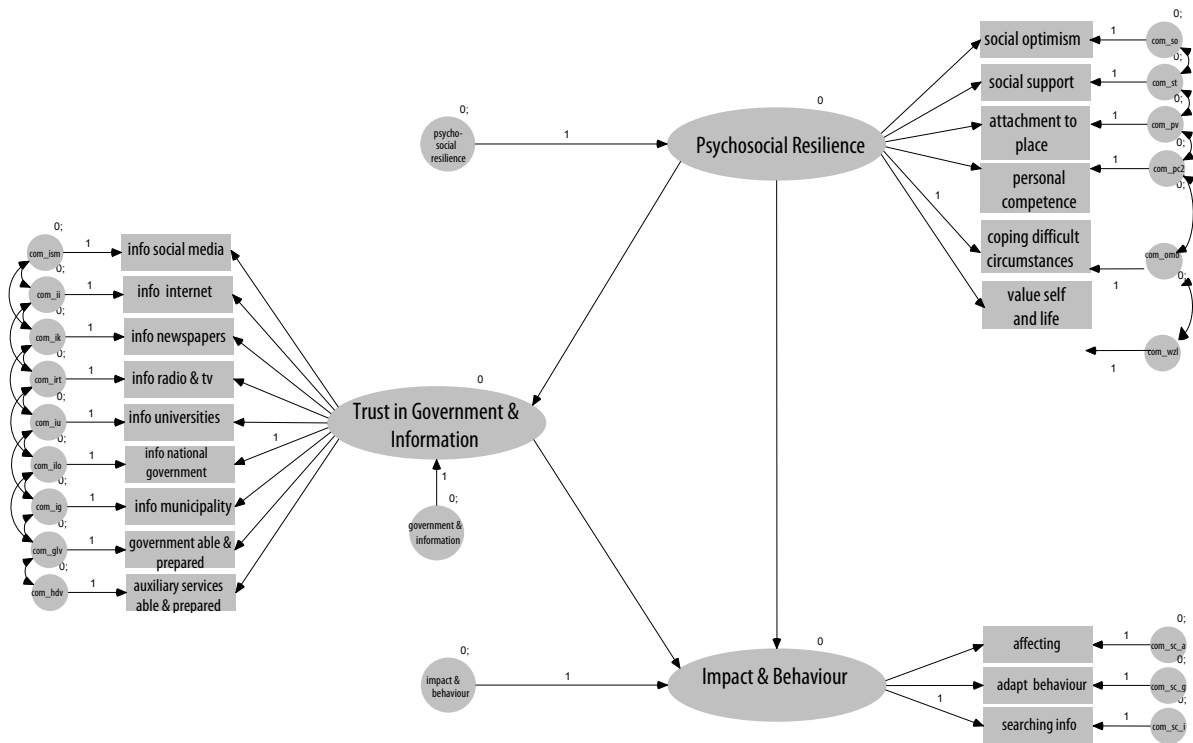


Table 5.5 Results model i-b without non-significant relations

		Estimation	Standard. estimation	S.E.	P
<i>Regression</i>					
Government and information	<--- psychosocial resilience	0.405	0.322	0.047	***
Impact and behaviour	<--- government and information	0.362	0.313	0.046	***
Impact and behaviour	<--- psychosocial resilience	0.148	0.102	0.054	**
<i>Model-fit</i>					
Chi-square	461.993 (degrees of freedom: 113)				
NFI	0.953				
TLI	0.945				
CFI	0.964				
RMSEA	0.048 (0.043-0.052; PCLOSE 0.797)				

* P<0.05 ** P<0.01 *** P<0.001 S.E.= standard error

Model ii-b: psychological resilience and social context in relation to Trust and Government and Information, and Impact and Behaviour

Model ii-b is the final model to be tested. It is a variant of Model ii-a where the relationships between constructs Psychological Resilience, Social Context, Trust in Government and Information, and Impact and Behaviour are tested.

This model is based on the following assumptions:

- an increase in Psychological Resilience has a positive effect on Social Context, Trust in Government, Information, Impact and Behaviour;
- an increase in Social Context has a positive effect on Trust in Government, Information and Impact and Behaviour;
- an increase in Trust in Government and Information has a positive effect on Impact and Behaviour.

Figure 5.6 Hypothetical model ii-b

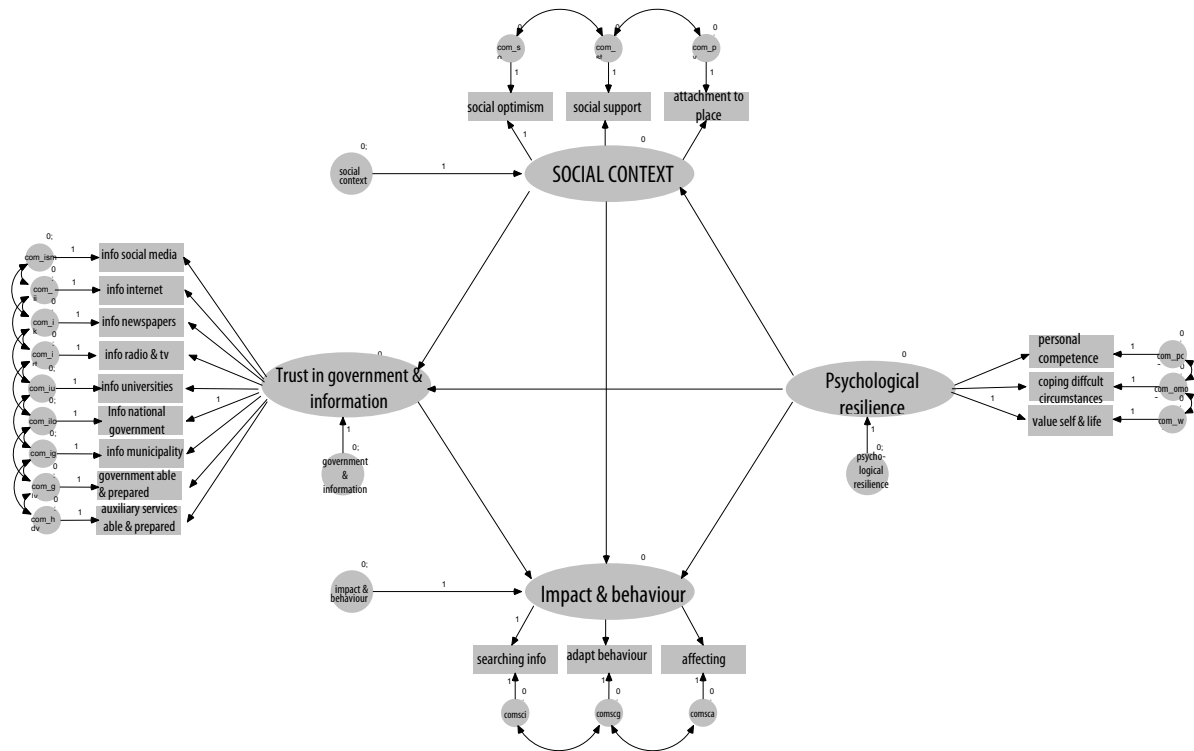


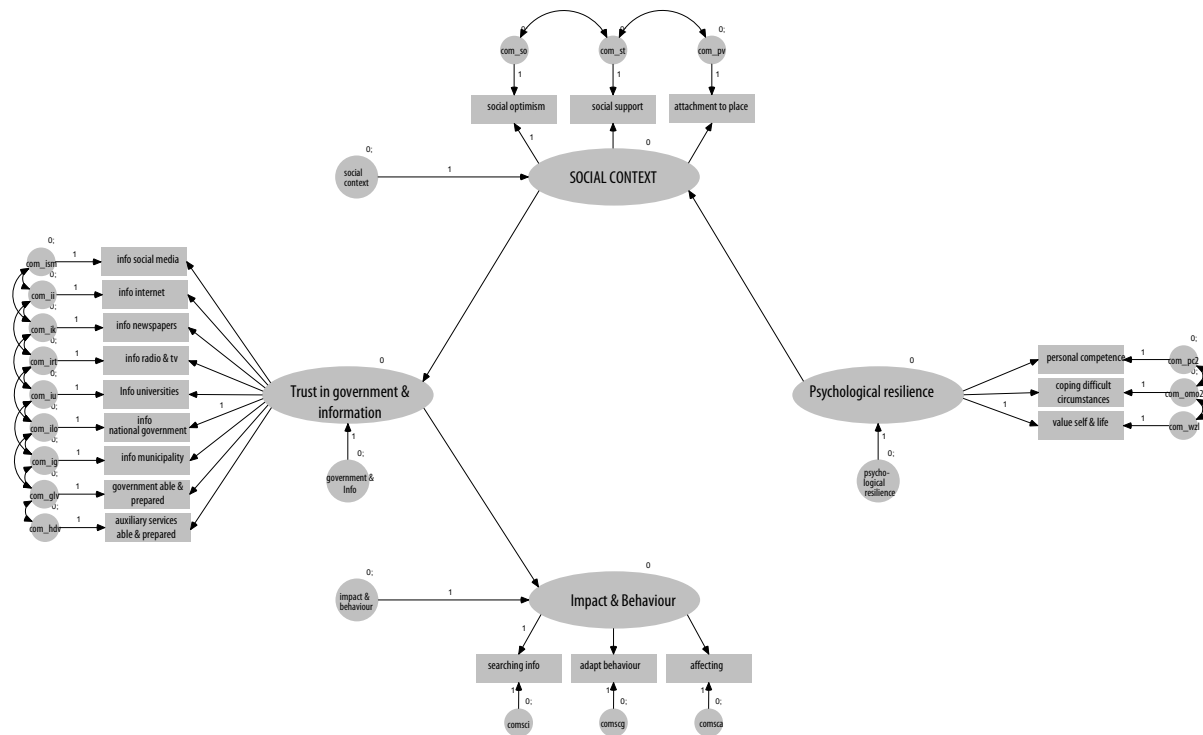
Table 5.6 Results hypothetical model ii-b

		Estimation	Standard. estimation	S.E.	P	
<i>Regression</i>						
social context	<---	psychological resilience	0.493	0.736	0.037	***
government and information	<---	social context	0.997	0.589	0.213	***
government and information	<---	psychological resilience	-0.205	-0.181	0.114	0.073
impact and behaviour	<---	government and information	0.334	0.293	0.060	***
impact and behaviour	<---	psychological resilience	-0.089	-0.069	0.105	0.396
impact and behaviour	<---	social context	0.376	0.195	0.199	0.059
<i>Model-fit</i>						
Chi-square	380.657 (degrees of freedom: 108)					
NFI	0.961					
TLI	0.955					
CFI	0.972					
RMSEA	0.043 (0.038-0.048; PCLOSE 0.992)					

* P<0.05 ** P<0.01 *** P<0.001 S.E.= standard error

Table 5.6 demonstrates that the sub-constructs of Social Context now have sufficient loading (>0.40). Furthermore, the total model meets the standards of the model-fit and therefore the data seem to confirm the existence of this model. Three of the estimated effects appear to be non-significant, the same applies to three co-variants. For this reason, an additional analysis is conducted where the direct positive influence of Psychological Resilience on Trust in Government and Information, and Impact and Behaviour is omitted. The same applies for the positive influence of Social Context on Impact and Behaviour (see figure 5.7).

Figure 5.7 Model ii-b without non-significant connections



The analysis shows that the high model-fit values do not change. An increase in Psychological Resilience of 1 runs parallel with an increase in Social Context of 0.49. An increase in Social Context is accompanied by an increase in Trust in Government and Information of 0.66. An increase of 1 for Trust and Government and Information is accompanied by an increase of 0.41 for Impact and Behaviour (see table 5.7).

This successive chain seems to imply that the expected direct connections between dependants and independents, which have been removed after the first round, possibly run via an intermediate variable. To investigate whether mediating effects are playing a role in this process, a Sobel Test (Two-Way) is conducted twice. From this test, it can be observed that the influence of Psychological Resilience on Trust in Government and Information is mediated by Social Context (Sobel Test Statistic: 7.70; $P < 0.001$). The influence of Social Context on Impact and Behaviour appears to be mediated by Trust in Government and Information as well (Sobel Test Statistic: 6.71; $P < 0.001$).

Table 5.7 Results model ii-b without non-significant connections

			Estimation	Standard. estimation	S.E.	P
<i>Regression</i>						
social context	<---	psychological resilience	0.494	0.695	0.037	***
government and information	<---	social context	0.660	0.414	0.070	***
impact and behaviour	<---	government and information	0.411	0.356	0.043	***
<i>Model-fit</i>						
Chi-square		395.871 (degrees of freedom: 114)				
NFI		0.959				
TLI		0.956				
CFI		0.971				
RMSEA		0.043 (0.038-0.047; PCLOSE 0.996)				

* P<0.05 ** P<0.01 *** P<0.001 S.E.= standard error

5.4 Comparing outcomes

In this chapter, several models have been tested. Important expected connections are demonstrated directly or indirectly (mediating).

Psychological resilience vs. Psychosocial resilience

Eventually model i-a scores too low on important fit-measures, like the TLI and the RMSEA. Attachment to place remains behind on the other sub-constructs concerning factor loading on the meta-construct Psychosocial Resilience. In Model ii-a, Attachment to Place has a better loading on Social Context. This model has satisfactory model-fit scores. The two sub-constructs – that could also be observed after the exploratory components analysis in the previous chapter – appear to be strongly associated.

Relationship with specific disaster constructs Trust in Government and Information, Impact and Behaviour

Both models show high model-fit values. For model i-b, the TLI falls just below the margin. The values in Model-ii b demonstrate that the version with two psychosocial constructs renders a better fit. Furthermore, this second model offers more insight into the connection between Psychological Resilience, Social Context, Trust in Government and Information, and Impact and Behaviour. Direct effects and indirect effects both play a role.

5.5 Conclusion

Based on the analyses it can be concluded that it is preferable to approach psychological resilience and social context as separate, but associated concepts instead of as one concept. On the one hand, because this theoretical model has the best empirical match. On the other hand, because content wise, it offers more insight into the internal connection and mediating effects.

6. Summary and conclusions

6.1 Introduction

The aim of the project Resilience Monitor was to develop a measuring tool, which can repeatedly be used to examine the degree to which the Dutch population is able to overcome a disaster or shocking event. To this end it is important to get an insight into the underlying mechanism of psychosocial resilience: which factors are connected to it and how? Before these questions are answered and a model of psychosocial resilience is presented in paragraph 6.4, 6.2 provides a short summary of the steps that were taken in this project and the results thereof and 6.3 discusses the limitations and the usability of the monitor. Subsequently, the implications of the results of the research will be presented in 6.5; what do the results mean now and which (practical) value do they have? Finally, 6.6 presents recommendations for further research.

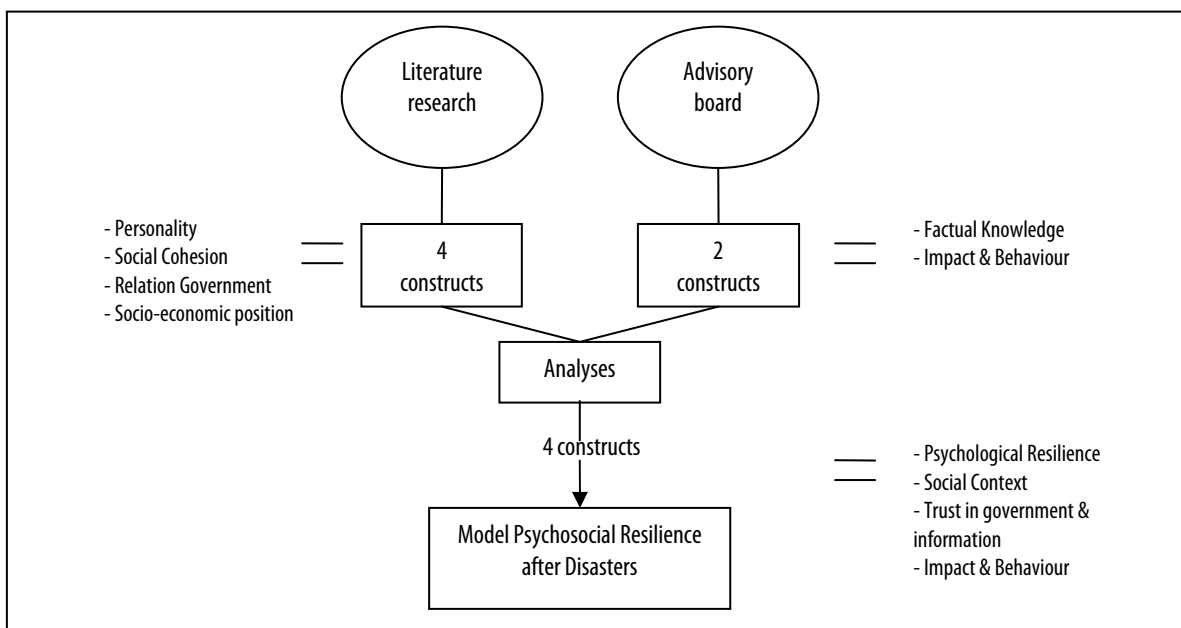
6.2 Process steps in this research

In this paragraph a short summary will be given of the research process. First of all, based on the literature search (described in chapter 2) and in discussion with the advisory board, six constructs for examination were determined:

- (i) Psychological Resilience;
- (ii) Social Context;
- (iii) Relationship with the Government;
- (iv) Socio-economic Position;
- (v) Impact and Behaviour;
- (vi) Factual Knowledge.

These constructs have been put into practice in a questionnaire, which has been administered amongst a representative sample of the Dutch population. Subsequently, by means of the data that was gathered the final model for psychosocial resilience after disasters was developed. Based on analyses, four of the six constructs remained (see also §6.3). These intrinsic steps are schematically presented in illustration 6.2.1.

Illustration 6.2.1 Intrinsic steps towards model Psychosocial Resilience after Disasters



6.3 Limitations and usability

Limitations in interpreting the results

The present research is a first, ambitious attempt to capture the psychosocial resilience of individual Dutch people after a disaster in a questionnaire. Several limitations have to be considered when interpreting the results of the current research.

The results are based on self-assessments of the respondents. Resilient behaviour is only displayed during and after an incident. The question is whether self-assessments before an incident show a relation to actual behaviour in a future situation: a person might think that he or she is very capable of overcoming a disaster or crisis but might still develop (long-term) psychosocial complaints after an actual incident. Further research will have to show to which extent (self)-assessments are predictors for resilient behaviour.

It is also important to realise that the research was conducted during a period of no or little social unrest. Respondents were probably lacking a context in which they could place their assessments (in particular when it comes to coping with shocking events). This may cause the respondents to express themselves (too) optimistically concerning their own resilience. Repeating this research during a more tumultuous period or with groups that have been exposed to a disaster, could offer a better view on this point.

Relating to this is the awareness that the present predictions are made with the assumption that existing institutions, such as government and culturally determined behavioural rules, will remain intact in case of a disaster or crisis. These could, however, collapse altogether so that a completely different situation emerges in which people will search for other forms of stability. In such circumstances, the significance of present assessments is limited.

Finally it should not be forgotten that the present research is based on a single sample survey. Despite being representative for the Dutch population it captures a specific moment in time. Possibly follow-up research based on another sample survey will come to different conclusions. This also concerns the associations found between the factors. To validate these it is desirable to conduct the present research several times.

Usability of the monitor

Despite the above-mentioned limitations, the monitor has a practical value already. Conducting the research in a relatively disaster-free period presents a general trend of what Dutch people think of resilience and the related identified factors.

If widely administered possible weak spots are laid bare that (preventatively) need more attention; are there reasons to pay more attention to enhancing the trust in information and capacities; facilitate contact between people (for vulnerable groups in particular); to use (other) media for distributing information?

Furthermore, the present research has made clear which factors are important when measuring resilience, in which way these factors can be measured, and how these factors correlate. It is a first step to establish the workings of the underlying mechanism of psychosocial resilience. A conceptual model was used, which was influenced by psychological aspects, a supporting social context, the relationship between government and citizen, expected impact and behaviour after a disaster, factual knowledge of disasters and socio-economic features.

Insight into these trends and correlations contributes to answering a question with great practical value: in which way can the resilience of Dutch people be influenced? The Resilience Monitor offers the key to enhancing and stimulating resilience. It can be used in identifying specific target groups based on features of background and scores on (aspects of) resilience or predicting to which extent individual or specific groups of citizens are able to cope after situations of crisis. Essentially, the monitor presents a basis from which further steps can be taken in the research- and policy area.

6.4 Conclusions

Measuring tool Psychosocial Resilience

The original questionnaire consisted of 84 questions, subdivided into six parts. Based on the results of the present research there is reason to doubt the necessity of including questions concerning Factual Knowledge. This will be elaborated on further on in this chapter. As a consequence the decision could be made to remove these questions from the questionnaire. However, from the usability test it appeared that respondents were interested in (and amused by) these questions.

Furthermore, several items belonging to Psychological Resilience and Social Context can be removed, because the analyses show that they do not sufficiently contribute to measuring these components. It concerns the following questions: 'It is okay if there are people who do not like me', 'In the past half year, how often have you talked to someone from your neighbourhood?', 'How often do you join such [parties or other activities to which several people are invited] activities?' and 'In the past half-year, how often have you co-operated with people from your neighbourhood to organise something, for example a party?'

If these adaptations are made, the original questionnaire can be reduced to a minimum set of 52 questions. The necessity of removing items depends on the research objective. When a practical aim is served, a shorter questionnaire saves time on filling out the questionnaire and conducting the analyses. When doing in-depth research, a longer questionnaire is recommended, in order to make comparisons to other (international) studies possible. The complete questionnaire is presented in annex 1.

General trends of psychosocial resilience amongst Dutch

Psychological resilience

Dutch people are positive about their level of psychological resilience and think that they are able to recover from a disaster or a crisis. 79.1 percent agree (completely) with the statement 'I am resilient'.

Furthermore, the Dutch obtain high scores on the *RS-nl* with a mean of 3.86 on a scale of 1 to 5. This correlates with the results of other (international) studies using the same measuring tool.

Social Context

The Dutch are satisfied with their social network. In general, they have sufficient social contacts to rely on during difficult times: as much as 87.6 percent indicate to be able to count on others. Furthermore, Dutch people are satisfied with their own functioning in social contacts: as much as 80 percent considers this to be satisfactory.

Regarding the interaction with the living environment, high scores are achieved, in particular when it concerns relatively superficial contact, like looking after each other's house during vacation or sharing information. In both cases, as much as 90 percent respond by indicating that they have someone in the neighbourhood who does this.

Relationship with the government

As much as half of the Dutch respondents find information from the government reliable, comprehensive and complete. In this respect, the national government achieves a higher score than municipalities. However, most trust is given to classic sources of information: newspapers, radio and TV. Information distributed through social media is considered less reliable: only 11 percent of the Dutch find information provided by social media (very) reliable. The younger age categories up to 36 years of age do seem to have a more positive view on social media, in particular concerning completeness and comprehensiveness.

Dutch people trust the capacities of the local and national governments to prevent or control a disaster. Between 50 and 60 percent think that the government is reasonably to completely prepared and between 45 and 55 percent think that the government would be (well) able to control a crisis.

Operational services such as ambulance, police and the fire department receive more trust. Three quarters of the respondents generally think that these services are prepared and capable.

Impact and Behaviour

A majority of the Dutch (84 percent) will take the advice of the government and gather as much information as possible concerning the disaster (between 40 and 60 percent). In response to the question to which degree they were affected by a certain disaster scenenario, a third - up to half of the respondents answer that they would find a disaster (very) affecting. In line with prior research (Norris *et al.*, 2002), disasters that concern intentional human action are considered to be more affecting.

Factual knowledge

The Dutch have rather a high level of factual knowledge of disasters and crises. In comparison to results of a previously conducted Flemish research Dutch people score relatively high with a mean score of 2.96 on a scale of 1 to 5 (the Flemish achieved a score of 1.91). Particularly questions about national and international events that are referred to relatively often (Katrina, 9/11), were answered correctly by a large percentage of the respondents. Questions about circumstances are answered correctly more often than questions about specific figures such the exact year or the number of victims.

Psychosocial Resilience model

In order to achieve a model of psychosocial resilience, six factors have been taken into consideration. Two of which, Socio-economic Position and Factual Knowledge, are not included in the final model.

Research demonstrates that socio-economic features such as gender, age and education play a role in the degree to which people are resilient (Bonanno *et al.*, 2007; Norris & Elrod, 2006). In chapter four, several paragraphs elaborated on a possible connection between the score obtained by respondents on various parts and socio-economic features such as age, education, income, gender, household composition and religion. Even though direct connections to the questions were not found, additional steps are required to analyse the exact relationship between various constructs and factors. Confirmatory analyses indicate that they influence the model of psychosocial resilience in the background. In order to avoid making the model of correlations needlessly complex, the choice was made not to include Socio-economic Position as a separate factor.

Factual knowledge was included due to similar research done by the University of Ghent in 2005. The results of this research demonstrated that the more factual knowledge people have of disasters, the more resilience they will show (Maesele *et al.*, 2008). However, present data cannot confirm this conclusion for the Dutch situation. The results indicate that a construct Factual Knowledge only shows a very weak connection with regard to Impact and Behaviour. On these grounds it is not evident that having factual knowledge about disasters contributes to psychosocial resilience.

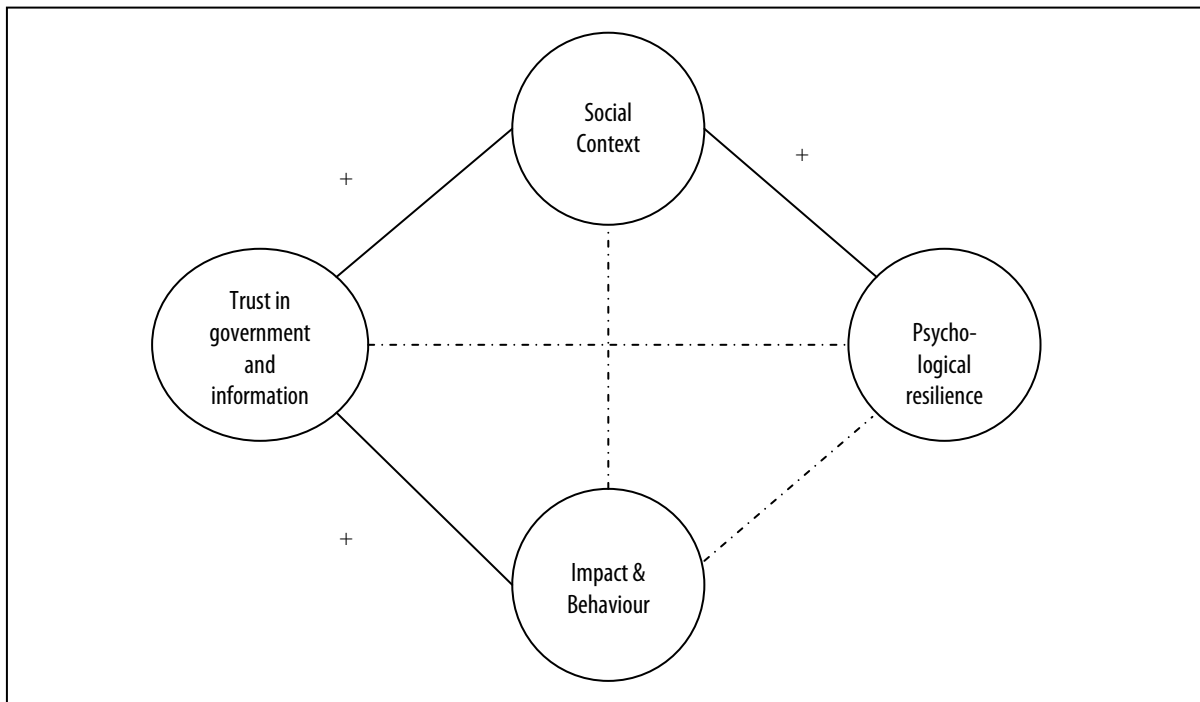
Now that Socio-economic Position as well as Factual Knowledge are not included in the model for Psychosocial Resilience, it consists of four constructs:

- (i) Psychological Resilience
- (ii) Social Context
- (iii) Trust in Government and Information
- (iv) Impact & Behaviour

'Buttons'

Figure 5.7 from chapter five demonstrated how different constructs influence each other. Illustration 6.3.1 is a simplified representation of this. It presents the constructs as buttons and shows which connections (solid line) between them are confirmed by the data and which associations are not confirmed (dotted-dashed line).

Illustration 6.3.1 'Buttons' and (non) confirmed connections



The most immediate effect on psychological resilience is realised by improving people's social context (consisting of social optimism, social support and attachment to place). When people's perception of their own social contacts and the degree to which they can rely on those contacts changes in a positive way, their psychological resilience also increases.

It was observed that social context plays a very important role, which corresponds with the findings from literature. Being satisfied with one's own social network and having the feeling one can rely on it during difficult times, has a positive effect on psychosocial resilience after a shocking event (Bonnano *et al.*, 2005; Benight *et al.*, 2006; Maesele *et al.*, 2008; Moscardino *et al.*, 2009). However, is not easy for an external party such as the Government to influence the way in which people evaluate their social context. Perhaps this is also not desirable. Mediating in contacts that people maintain with each other or in individual functioning in social contacts seems to contradict the idea of a withdrawing government and the 'end of patronisation'.⁷ What is more, the question could be asked how much resilience would be gained in this situation, especially when most people already have a positive view of their social context as can be seen from the data.

Furthermore, illustration 6.3.1 shows that the degree to which people trust the government and information (indirectly) influences psychological resilience. Although connection is mediated by Social Context, it is a factor that creates possibilities for external parties to offer guidance into certain directions. Since they have control over the way in which information is communicated and the way they act during a disaster or crisis.

The data demonstrate that, at this moment, Dutch people have a positive view of the information being sent out by the government in relation to (possible) disasters. It is considered to be comprehensive, complete and reliable. It is important that the government retains this trust, so that citizens will take information and advice from the government and will be able to (re)act in ways that ensure their safety and well-being (Heldring, 2004; Rogers *et al.*, 2007). It is interesting to see that the national government obtains better scores on comprehensiveness, reliability and completeness than the municipality. In literature, it is sometimes assumed that local sources of information are considered more reliable than sources that are relatively distant (Norris & Stevens, 2007).

⁷ Expression of the Minister of Public health, Science and Sports Edith Schippers, cited on 7-12-2010 (http://www.edithschippers.vvd.nl/waar_sta_ik_voor_14959/)

Despite the relatively high scores for national and local governments on this aspect, Dutch people put more trust in other traditional sources of information like radio, newspapers and TV. This is an interesting aspect because research has shown that the more trust people have in information from the government, the less they are inclined to consult other sources of information and the less risk they run of developing psychosocial complaints (Archetti & Taylor, 2004; Maesele *et al.*, 2008).

Although the amount of trust Dutch people have in the capacities of the local and national governments to prevent a disaster or control it, is relatively large, trust is predominantly given to operational services like the fire department, ambulance or police. Possibly, this is the case because the capacities of these services are demonstrated during people's daily lives, while the government will mostly operate behind the scenes and/or fulfils a symbolic function during calamities.

According to the model in illustration 6.3.1 a final possibility to influence psychological resilience is presented through the construct Impact and Behaviour (consisting of the degree to which people are affected by a disaster, behaviour is adapted and information is being searched for). However, this influence is mediated by Trust in Government as well as Social Context. At this moment, Dutch people predict that they will not adapt their behaviour to any great extent after a disaster and they also indicate that they will take the advice of the government during such a time. Based on this information it seems unlikely that any improvements on this point will be achieved that would eventually lead to an increase in resilience.

Missing connections

What can also be observed from illustration 6.3.1 is that several connections between constructs are not supported by the data. For instance, a direct link between Psychological Resilience and Trust in Government and Information is missing. As indicated above, if the government wants to influence psychological resilience this is mediated by Social Context.

Furthermore, a direct connection between Impact and Behaviour and Psychological Resilience was not confirmed. Only influencing the way in which people (think they) will react would, according to the present data, have no direct influence on psychological resilience.

Finally, the data does not show a direct connection between Impact and Behaviour and Social Context. The perception people have of their own social environment does not seem to influence the way in which people think they will react to a disaster or will be affected by it.

6.5 Implications

At this moment the questionnaire already provides an insight into several important issues: what do the Dutch think of their own resilience? What do they think of their social context? How do they expect they will react during/after a disaster? Which sources of information do they trust the most? How much trust do Dutch people have in information and capacities of the Dutch government? In this respect it reflects a general trend for psychosocial resilience, providing policymakers with a focus on how to further organise policy:

- (i) Although the local and central governments obtain high scores, more trust is given to other classic sources of information (newspapers, radio and TV). Social media is much less appreciated as a source of information, also amongst younger age groups. Take this into account when choosing means of communication. It could influence the effectiveness of communication;
- (ii) Even though the Dutch trust the capacities of the government to prevent a disaster or control it, operational services such as the fire department, ambulance and police perform better. This is possibly due to the visibility of the government after calamities. Governmental actions often stay behind the scenes and have a symbolic meaning. To generate more trust, attention could be paid to informing the public of the actions and preparations of the local and central government in case of a disaster;
- (iii) The trust of the public in information and (crisis control) capacities seems to possibly influence psychological resilience. However, effects are mediated by Social Context.

- (iv) The results indicate that the effects of changes in Impact and Behaviour on psychological resilience are mediated by Trust in Government and Information as well as Social Context. This implies that policy aimed at changing behaviour only, will have little influence on resilience. Further research into this relationship and ways to actually influence Impact and Behaviour is required.

6.6 Recommendations

In relation to the above, a couple of recommendations can be formulated to remove limitations to the current research or to render more specific knowledge of psychosocial resilience by using the monitor.

First of all, the present research is based on the self-assessment of Dutch people of their psychological resilience, their social context, their relationship with the government and the behaviour they will show during a disaster. Even though on several aspects, positive mean scores were obtained and we can assume that the Dutch will be resilient, additional research is needed to demonstrate to which extent the questionnaire has a predictive value. To which extent are assessments of resilience also predictors of actual behaviour after a disaster and of the ability to cope?

This can be examined by using constructs to further investigate the specific factors that relate to psychosocial resilience. For Trust in Government and Information it can be examined which type of information the government should communicate after a disaster and which form of information provision is optimal. Different means of communication can be considered, but the connection to the construct Social Context should be kept in mind. Model 5.7 and illustration 6.3.1 demonstrate that the influence of Trust in Government and Information on psychological resilience is mediated by social environment. It can be examined whether providing information through social networks does lead to improved psychological resilience or an increased appreciation for governmental communication.

Furthermore, an option is to apply the questionnaire to a certain population group or occupational group who have experienced a shocking event during a certain time span. People can be questioned about their actual behaviour in the succeeding period. Based on the results it can be established whether significant differences appear on certain aspects with the general population, that was the central focus during the present research. What is more, this can be an indication whether estimations of behaviour during a disaster and self-assessments of psychological resilience are actual predictors of the ability to cope in a disaster context.

Finally, this is the first time that a tool has been developed which allows psychosocial resilience to be measured. This offers the opportunity to match the results from the questionnaire with other research areas within the physical security and crisis control, such as scenarios of the National Risk assessment, (social-) geographical location, economic and/or political developments. To focus on one geographical area is interesting in the sense that regional profiles could be created. Ideally, these would be longitudinal measurements to establish what kind of influence societal processes and specific events have. Based on this a total image can be achieved of the short- and long-term social vulnerability of the Dutch society.

References

1. Adger, W.N.; Hughes, T.P.; Folke, C.; Carpenter, S.R., Rockström, J. (2005). *Social-ecological resilience to coastal disasters*. Science, Vol. 309, pp.1036-1039.
2. Ahern, N.R.; Kiehl, E.M.; Sole, M-L. & Byers, J. (2006). *A review of instruments measuring resilience*. Issues in Comprehensive Pediatric Nursing, No.9, pp 103-125.
3. Ahmed, R.; Seedat, M.; Van Niekerk, A.& Bulbulia, S. (2004). *Discerning Community Resilience in Disadvantaged Communities in the context of violence and injury prevention*. South African Journal of Psychology, Vol. 34, No. 3, pp.386-408.
4. Anderson, J.C. & Gerbing, D.W. (1988). *Structural Equation Modelling in Practice: a Review and Recommended Two-step Approach*. Psychological Bulletin, Vol. 103, No. 3, pp. 411-423.
5. Appelo, M.T. (2005). *Positieve Uitkomsten Lijst (PUL)*. Cure & Care Publishers, Nijmegen: 2005.
6. Archetti, C. & Taylor, P.M.T. (2004) *Managing Terrorism After 9/11: the War On Terror, The Media, and the Imagined Threat* [online], [cited on 27-04-2009], available on the World Wide Web through <<http://www.terrorismresearch.net/finalreports/Taylor/Final%20Report.pdf>>
7. Aroian, K.J.; schappler-Morris, N.; Neary, S.; Spitzer, A. & Tran, T.V. (1997). *Psychometric evaluation of the Russian Language version of the Resilience Scale*. Journal of Nursing Measurement, Vol. 5, No. 2, pp. 151-64.
8. Benight, C.C.; MacFarlane, A.C. & Norris, F.H. (2006). *Formulating Questions about Postdisaster Mental Health*. Chapter 4 in: Methods for Disaster Mental Health Research, F.H. Norris; S. Galea; M.J. Friedman, P.J. Watson (eds). The Guildford Press: New York, London.
9. Bentler, P.M. & Bonett, D.G. (1980). *Significance tests and goodness of fit in the analysis of covariance structures*. Psychological Bulletin, Vol. 88, pp. 588-606.
10. Bielby, W.T. & Hauser, R.M. (1977). *Structural Equation Models*. Annual Review of Sociology, Vol. 3, pp. 137-161.
11. Bland, J.M. & Altman, D.G. (1997). *Statistical Notes: Cronbach alpha*. BMJ, Vol. 314, pp.572.
12. Block, J. & Kremen, A.M. (1996). *IQ and Ego-resiliency: Conceptual and Empirical Connections and Separateness*. Journal of Personality and Social Psychology, Vol. 70, No. 2, pp. 349-361.
13. Bonanno, G. A. (2004). *Loss, Trauma and Human Resilience: have we underestimated the human capacity to thrive after extremely aversive events?* American Psychologist, vol. 59, pp 20-28.
14. Bonanno, G.A.; Rennie, C. & Dekel, S. (2005). *Self-Enhancement Among High-Exposure Survivors of the September 11th Terrorist Attack: Resilience or Social Maladjustment?* Journal of Personality and Social Psychology, Vol.88, No. 6, pp. 984-998.
15. Bonanno, G.A.; Galea, S.; Bucciarelli, A. & Vlahov, D. (2006). *Psychosocial Resilience After Disaster: New York City in the Aftermath of the September 11th Terrorist Attack?* Psychological Science, Vol. 17, No. 3, pp. 181-186.
16. Bonanno, G.A.; Galea, S.; Bucciarelli, A. & Vlahov, D. (2007). *What predicts psychosocial resilience after disaster? The role of demographics, resources and life stress*. Journal of Consulting and Clinical Psychology, Vol.75, No. 5, pp.671-682.
17. Bonanno, G.A. & Mancini, A.D. (2008). *The human capacity to thrive in the face of potential trauma*. Pediatrics, Vol. 21, pp. 369-375.

18. Browne, M.W. & Cudeck, R. (1993). *Alternative ways of assessing model fit*. In: Testing structural equation models, Bollen, K.A. & Long, J.S (eds). Newbury Park, CA: Sage.
19. Buckner, J.C. (1988). *The Development of an Instrument to Measure Neighborhood Cohesion*. American Journal of Community Psychology, Vol. 16, No. 6, pp. 771-791.
20. Butler, L.D.; Koopman, C.; Azarow, J.; Blasey, C.M; Magdalene, J.C; DiMiceli, S; Seagraves, D.A.; Hastings, T.A.; Chen, X.H.; Garlan, R.W.; Kraemer, H.C.& Spiegel, D. (2007). *Psychosocial Predictors of Resilience After the September 11,2001 Terrorist Attacks*. Journal of Nervous and Mental Disease, Vol. 197, No. 4, pp. 266-273.
21. Byrne, B.M. (2001). *Structural Equation Modelling with AMOS*. Mahwah, NJ: Lawrence Erlbaum
22. Caplan, G. (1990). *Loss, stress, and mental health*. Community Mental Health Journal, Vol. 26, pp. 7-48.
23. Centraal Bureau voor de Statistiek (2006). *Verhuiscwensen uit het Woononderzoek Nederland 2006* [online], [cited on 02-10-2010]. Available on the World Wide Web through <<http://www.cbs.nl/NR/rdonlyres/B29463C4-8347-467B-9E38-F379F2591E27/0/2007k3b15p20art.pdf>>
24. Centraal Bureau voor de Statistiek (2010). *Religie, naar regio, 2000-2002 of 2003*. [online], [cited on 26-10-2010]. Available on the World Wide Web through <<http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=70794NED&D1=a&D2=0&D3=0&HDR=T&STB=G1,G2&VW=T>>
25. Centraal Bureau voor de Statistiek (2010). *Inkomensklassen, personen in particuliere huishoudens, naar kenmerken*. [online], [cited on 26-10-2010]. Available on the World Wide Web through <<http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=71510NED&D1=0&D2=1&D3=07&D4=a&D5=a&D6=0&D7=l&HDR=T,G6,G1,G5,G4,G3&STB=G2&VW=T>>
26. Centraal Bureau voor de Statistiek (2010). *Toegang tot internet* [statline]. [online], [cited on 27-10-2010]. Available on the World Wide Web through <<http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=71098NED&D1=33-34&D2=0&D3=l&VW=T>>
27. Clauss-Ehlers, C.S. (2008). *Sociocultural factors, resilience and coping: support for a culturally sensitive measure of resilience*. Journal of Applied Developmental Psychology, Vol. 29, pp.197-212.
28. Coffmann, D.L. & BeLue, R. (2009). *Disparities in Sense of Community: True race differences or differential item functioning?* Journal of Community Psychology, Vol. 37, No.5, pp. 547-558.
29. Colten, C.E.; Kates, R.W. & Laska, S.B. (2008). *Community resilience: lessons from New Orleans and Hurricane Katrina* [online]. [cited on 25-04-2009]. Available on the World Wide Web through <http://www.resilientus.org/library/FINAL_COLTEN_9-25-08_1223482263.pdf>
30. Connor, K.M. & Davidson, J.R.T. (2003). *The Development of a New Resilience Scale: The Connor-Davidson Resilience Scale (CD-RISC)*. Depression and Anxiety, Vol. 18, pp. 76-82.
31. Connor, K.M.; Davidson, J.R.T. & Lee, L.C. (2003). *Spirituality, Resilience, and Anger in Survivors of Violent Trauma: A Community Survey*. Journal of Traumatic Stress, Vol. 16, No.5, pp. 487-494.
32. Costello, A.B. & Osborne, J.B. (2005). *Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most Out from Your Analysis*. Practical Assessment, Research & Evaluation, Vol. 10, No. 7, pp. 1-9.

33. Cureton, E.E. & Mulaik, S.A. (1975). *The weighted varimax rotation and the promax rotation*. Psychometrika, Vol. 40, No. 2, pp 183-195.
34. Daultrey, S. (1976). *Principal Component Analysis*. Concepts and Techniques in Modern Geography. Geo Abstract Ltd., University of East Anglia: Norwich.
35. Dekker, G. (2007). *Het christelijk godsdienstig en kerkelijk leven*. Chapter 1 in: God in Nederland, Bernts, T.; Dekker, G. & Hart, J. de (eds.). Uitgeverij Ten Have: Kampen.
36. Dückers, M.L.A.; Hoijtink, L.M.; Beerepoot, A.J.M. & Rooze, M.W. (2010). *Signalering nafase: waar de nafase van een ramp of crisis de grenzen van gemeente of regio overschrijdt*. Impact: Amsterdam.
37. Earvolino-Ramirez, M. (2007). *Resilience: A Concept Analysis*. Nursing Forum, Vol. 42, No. 2, pp. 73 – 82.
38. Fischer, P. & Ai, A.L. (2008). *International terrorism and mental health: recent research and future directions*. Journal of Interpersonal Violence, Vol. 23, No. 3, pp.339-361.
39. Folke, C. (2006). *Resilience: the emergence of a perspective for social-ecological systems analyses*. Global Environmental Change, Vol. 16., pp. 253-267.
40. Friberg, O.; Hjemdal, O.; Rosenvinge, J.H. & Martinussen, M. (2003). *A new rating scale for adult resilience: what are the central protective sources behind healthy adjustment?* International Journal of Methods in Psychiatric Research, Vol. 12, No. 2, pp. 65-76.
41. Frieling, M.A. (2008). *Een goede buur: 'Joint production' als motor voor actief burgerschap in de buurt*. Proefschrift: Rijksuniversiteit Groningen.
42. Fukuyama, F. (2001). *Social capital, Civil Society and Development*. Third World Quarterly, Vol. 22, No. 1, pp. 7-20.
43. Gemeente Apeldoorn (2010). *Veerkracht & Verbinden: bestuursakkoord 2010 – 2014* [online], [cited on 3-12-2010]. Available on the World Wide Web through <http://www.apeldoorn.nl/data/TER/docs/actueel/nieuws/pdf/2010/04%20april/20100423_bestuursakkoord.pdf>
44. Girtler, N.; Casari, E.F., Brugnolo, A., Cutolo, M., Dessi, B; Guasco, S.; Olmi, C. & De Carli, F. (2010). *Italian validation of the Wagnild and Young Resilience Scale: a perspective to rheumatic diseases*. Clinical and experimental rheumatology (E-publication ahead of print).
45. Granello, D.H. & Wheaton, J.E. (2004). *Online Data Collection: Strategies for Research*. Journal of Counseling and Development, Vol. 82, No. 4, pp. 387-393.
46. Greeff, A.P. & Loubser, K. (2008). *Spirituality as a Resiliency Quality in Xhosa-speaking Families in South-Africa*. Journal of Religious Health, Vol. 87, pp. 288-301.
47. HaïtiNU (2010). *Over Haïti*. [online], [cited on 13-12-2010]. Available on the World Wide Web through <<http://haitinu.nl/pages/over-haiti/>>
48. Harkness, J.A. & Schoua-Glusberg, A. (1998). *Questionnaires in translation*. ZUMA-Nachrichten Spezial, January 1998.
49. Heldring, M. (2004). *Talking to the public about terrorism: promoting health and resilience*. Families, Systems and Health, Vol. 22, pp. 67-71.
50. Heilemann, M.V.; Lee, K. & Kury, F.S. (2003). *Psychometric Properties of the Spanish Version of the Resilience Scale*. Journal of Nursing Measurement, Vol. 11, No. 1, pp. 61-72.

51. Iacobucci, D. & Duhachek, A. (2003). *Advancing Alpha: Measuring Reliability with Confidence*. Society for Consumer Psychology.
52. Kimweli, D.M.S. & Stilwell, W.E. (2002). *Community subjective well-being, personality traits and quality of life therapy*. Social Indicators Research, Vol. 60, pp. 193-225.
53. Lemyre, L.; Clément, M.; Corneil, W.; Craig, L. ; Boutette, P. ; Tyshenko, M. ; Karyakina, N. ; Clarke, R. & Krewski, D. (2005). *A Psychosocial Risk Assessment and Management Framework to Enhance Response to CBRN Terrorism Threats and Attacks*. Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science, Vol. 3, No. 4, pp. 316-330.
54. Lundman, B.; Stranberg, G.; Eisemann, M.; Gustafson, Y. & Bruline, C. (2007). *Psychometric properties of the Swedish Version of the Resilience Scale*. Scandinavian Journal of Caring Sciences, No. 21, pp. 229-237.
55. Luthar, S.S.; Cicchetti, D. & Becker, B. (2000). *The Construct of Resilience: a critical evaluation and guidelines for future work*. Child Development, Vol. 71, No. 3, pp.543-562.
56. Maesele, P.A.; Verleye, G.; Stevens, I. & Speckhard, A. (2008). *Psychosocial resilience in the face of a mediated terrorist threat*. Media, War & Conflict, Vol. 1, No. 1, pp. 51-70.
57. MacFarlane, A.C. & Norris, F.H. (2006). *Definitions and Concepts in Disaster Research*. Chapter 1 in: *Methods for Disaster Mental Health Research*, Norris, F.H.; Galea, S.; Friedman, M.J. & Watson, P. (eds). Guilford Press: New York, London.
58. MarketResponse (2010). *De Onderzoek Groep*. [online], [cited on 26-10-2010]. Available on World Wide Web through <<http://www.marketresponse.nl/over-marketresponse/de-onderzoek-groep/>>
59. Masten, A.S. (2007). *Resilience in developing systems: progress and promise as the fourth wave rises*. Development and Psychopathology, Vol. 19, pp. 921-930.
60. Ministry of Housing, Spatial planning and Environment (2004) *Leefbaarheid van Wijken* [online], [cited at 26-10-2010]. Available on the World Wide Web through <www.vrom.nl>
61. MOA – Center for Marketing Intelligence and Research (2010). *Gouden Standaard*. [online], [cited on 26-10-2010]. Available on the World Wide Web through <<http://www.moaweb.nl/>>
62. Moscardino, U.; Scrimin, S.; Capello, F. & Altoè, G. (2009). *Social support, sense of community, collectivistic values and depressive symptoms in adolescent survivors of the 2004 Beslan terrorist attack*. Social Science and Medicine, Vol. 70, pp. 27-34.
63. Nationaal Crisis Centrum (2010). *Samenwerken aan 'veerkracht van groepen' na crises – workshop community resilience*. [online], [cited on 03-12-2010]. Available on the World Wide Web through <<http://www.nationaalcrisiscentrum.nl/document/samenwerken-aan-%E2%80%98veerkracht-van-groepen%E2%80%99-na-crisis-workshop-community-resilience>>
64. NOPVO (2010). *Uitkomsten van het NOPVO*. [online],[cited on 02-11-2010]. Available on the World Wide Web through <http://www.nopvo.nl/page0/files/Resultaten_NOPVO_Nederlands.pdf>
65. Norris, F.H.; Friedman, M.J.; Watson, P.J.; Byrne, C.M.; Diaz, E. & Kaniasty, K. (2002). *60,000 Disaster Victims Speak: Part I. An Empirical Review of the Empirical Literature, 1981-2001*. Psychiatry Vol 65, No. 3, pp. 207-239.
66. Norris, F.H. & Elrod, C.L. (2006). *Psychological consequences of disaster: a review of past literature*. Chapter 2 In: Norris, F.H.; Galea, S.; Friedman, M.J.; Watson, P.J. (eds). *Methods for Disaster Mental Health Research*. New York: The Guilford Press.

67. Norris, F.H. & Stevens, S.P. (2007). *Community Resilience and the Principles of Mass Trauma Intervention*. *Psychiatry*, Vol. 70, Number 4, pp. 320-328.
68. Norris, F.H.; Stevens, S.P.; Pfefferbaum, B.; Wyche, K.F. & Pfefferbaum, R.L. (2008). *Community Resilience as a Metaphor, Theory, Set of Capacities, and Strategy for Disaster Readiness*. *American Journal for Psychology*, Vol. 41, pp. 127-150.
69. Paton, D.; Millar, M. & Johnston, D. (2001). *Community Resilience to Volcanic Hazard Consequences*. *Natural Hazards*, Vol. 24, pp.157-169.
70. Personal communication Prof.dr. G. Verleye.
71. Portzky, M. (2008). *RS-nl: Resilience Scale – nederlandse versie handleiding*. Hartcourt Test Publishers, Amsterdam.
72. Rijksoverheid (2010). *Wie doet wat bij een crisis of ramp?* [online], [cited on 8-10-2010], available on the World Wide Web through <<http://www.rijksoverheid.nl/documenten-en-publicaties/vragen-en-antwoorden/wie-doet-wat-bij-een-crisis-of-ramp.html#anker-het-leger>>
73. Rogers, M.B.; Amlôt, R.; Rubin, G.J.; Wessely, S. & Krieger, K. (2007). *Mediating the social and psychological impacts of terrorist attacks: The role of risk perception and risk communication*. *International Review of Psychiatry*, Vol 19, No. 3, pp. 279-288.
74. Rutter, M. (2007). *Resilience, competence and coping*. *Child Abuse & Neglect*, Vol.31, pp. 205-209.
75. Santos, J.R.A. (1999). *Cronbach's Alpha: A Tool for Assessing the Reliability of Scales*. *Journal of Extension*, Vol. 37, No. 2.
76. Sax, L.J.; Gilmartin, S.K. & Bryant, A.N. (2003). *Assessing Response Rates and Nonresponse Bias in Web and Paper Surveys*. *Research in Higher Education*, Vol. 44, No. 4, pp.409-432.
77. Stanton, J.M. (1998). *An Empirical Assessment of Data Collection Using the Internet*. *Personnel Psychology*, Vol. 51, pp. 709–725.
78. Seplaki, C.L.; Goldman, N.; Weinstein, M. & Lin, Y.H. (2006). *Before and after the 1999 Chi-Chi earthquake: Traumatic events and depressive symptoms in an older population*. *Social Science Medicine*, Vol. 62, pp. 3121-3132.
79. Tinsley, H.E.A. & Tinsley, D.J. (1987). *Uses of Factor Analysis in Counseling Psychology Research*. *Journal of Counseling Psychology*, Vol. 34, No. 4, pp. 414-424.
80. Tobin, G.A. (1999). *Sustainability and Community Resilience: the holy grail of hazards planning?* *Environmental Hazards*, Vol. 1, pp. 13-25.
81. Triebelmaier, H. & Filzmoser, P. (2010). *Exploratory factor analysis revisited: How robust methods support the detection of hidden multivariate data structures in IS research*. *Information & Management*, No. 47, pp. 197-207.
82. Tusaie, K. & Dyer, J. (2004). *Resilience: a historical review of the construct*. *Holistic Nursing Practices*, No. 18, pp. 3-8.
83. Ursano, R.J.; Fullerton, C.S. & Terhakopian, A. (2008). *Disasters and Health: Distress, Disorders and Disasters Behaviors in Communities, Neighborhoods and Nations*. *Social Research*, Vol. 75, No. 3, pp. 1015-1028.
84. Wagnild, G. & Young, H.M. (1993). *Development and psychometric evaluation of the Resilience Scale*. *Journal of Nursing Measurement*, Vol. 1, No. 2, pp. 165-177.

85. Wagnild, G. (2003). *Resilience and Successful Ageing: Comparison among low and high income older adults*. *Journal of Gerontological Nurses*, Vol. 29, No. 12, pp.42-49.
86. Walsh, F. (2007). *Traumatic Loss and Major Disasters: Strengthening Family and Community Resilience*. *Family Process*, Vol. 46, No. 2, pp. 207-227.
87. Wagnild, G. (2009). *A Review of the Resilience Scale*. *Journal of Nursing Measurement*, Vol. 17, No. 2, pp. 105-113.
88. Wright, K.B. (2005). *Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services*. *Journal of Computer-Mediated Communication*, Vol. 10, No. 3.
89. Zuidgeest, M.; Hendriks, M.; Spreeuwenberg, P. & Rademakers, J. (2008). *Methoden van Data-verzameling bij CQI Onderzoek: Gebruikswaarde van de CQI-index Deelrapport 1*. [online],[cited on 27-10-2010]. Available on the World Wide Web through <http://www.nivel.nl/pdf/Rapport_gebruikswaarde_CQindex_%20deel1.pdf>

Annexes

Annex 1. Questionnaire & protocol resilience monitor

An English version of the original Dutch questionnaire used in this report is presented below.

Items in the questionnaire regarding Personal Traits stem from the English language. Original English questions were therefore used in this report, unless stated otherwise in chapter 3.

For the remaining categories Dutch language instruments were used. These were translated into English by a Dutch translation agency and then verified by an English native speaker. The method of back translation was used to check whether the original Dutch meaning of the questions was preserved in the translated English version. The process of back translation is regularly applied in research and refers to the translation of a translation back to the original source language (Harkness & Schoua-Glusberg, 1998). In this case Dutch → English → Dutch. Two back translations were conducted independently by Dutch native speakers. Results indicated that in the majority of cases, the original Dutch meaning was maintained in the English translation. Only a few alterations were made.

Personal traits

1. I am resilient

By resilience the following is meant: *Being capable of executing normal, **daily tasks** (for example, work, household chores, taking care of the children, etc.), being able to **relax** (for example by reading a book, exercising, watching TV, practicing a hobby etc.) and **keeping in touch with loved ones** (for example by doing things together, talking, showing interest in the other person, etc.) after a disaster.*

2. When I make plans I follow through with them
3. I usually manage one way or another
4. I am able to depend on myself more than I expect others to be able to depend on themselves
5. Keeping interested in things is important to me
6. I can be on my own if I have to
7. I feel proud that I have accomplished things in my life
8. I usually take things in stride
9. I am friends with myself
10. I feel that I can handle many things at a time
11. I am determined
12. I doubt the meaning of life
13. I take things one day at a time
14. I can get through difficult times because I have experienced difficulty before
15. I have self-discipline
16. I keep interested in things
17. I can usually find something to laugh about
18. My belief in myself gets me through hard times
19. In an emergency, I am someone people generally can rely on
20. I can usually look at a situation in a number of ways
21. Sometimes I make myself do things whether I want to or not
22. My life has meaning
23. I do not dwell on things I cannot do anything about
24. When I am in a difficult situation, I can usually find my way out of it
25. I have enough energy to do what I have to do
26. It is okay if there are people who do not like me*⁸

Social cohesion

27. I can count on others
28. I function well in social contacts

⁸ Questions marked with an asterisk did not sufficiently contribute to the construct and may be removed in a minimum set

29. I am satisfied with the number of social contacts that I have
30. How often did you talk to someone in your environment in the past half year?*
31. If you are away from home for a longer period of time, is there someone in your environment who keeps an eye on your house, for example by checking whether your house is not broken into, by taking care of your pets or watering the plants?
32. When something important happens in your neighbourhood, at work or to your family or friends, is there someone in your environment who would share this with you?
33. Do you feel involved with the people in your environment?
34. When there is a sad moment or a sad event in your life, is there someone in your environment whom you turn to and can rely on?
35. Are there any parties or other activities in your environment to which a number of people are invited?
36. How often do you go to these parties or activities?*
37. How often have you co-operated with others in your environment to organise something, for example a party?*

Explanation:

By environment we mean family, acquaintances, colleagues and neighbours.

38. I feel attached to the neighbourhood in which I live
39. I would certainly like to continue living in this neighbourhood for a few more years.

Relationship Public-Government

40. To which extent would you take advice from the government during disasters?
41. How much trust do you have in the completeness of the information about disasters provided by the following organisations?
42. How reliable do you consider the information provided by the following organisations?

Organisations:

Radio and TV;
Newspapers;
Internet;
Local government;
National government;
Universities

43. How comprehensible do you consider the information about disasters provided by the following organisations?
44. To which extent do you think the following governments and services are prepared for a disaster?
45. To which extent do you think the following governments and services are able to handle the consequences of a disaster?

Governments and services:

Municipality;
National government;
Fire department;
Police;
Ambulance;
Army

46. To which extent are you satisfied with the swiftness of the information provision of the government?

Impact and behaviour

Flu

Scenario:

A serious, contagious flu outbreak is spreading across Europe. Many countries, amongst which Germany, Belgium, France and Austria, announce that an increasing number of people have been infected by the flu. In those countries some people have also died from the flu, primarily adults above 65 years of age. The flu is also found in the Netherlands and has caused 350 infections in a period of three months. Nobody has died from the flu yet. No vaccine is available. The government advises people to thoroughly wash their hands and to avoid physical contact with infected people as much as possible in order to stop the flu from spreading.

The respondent and the people in his/her surroundings have not yet been infected by the flu.

- 47. I will avoid all contact with people who are possibly infected with the flu
- 48. I will take the measures required in order not to become infected
- 49. I will gather as much information as possible regarding this flu
- 50. To what extent do you think you will be affected by this flu?

Bomb attack

Scenario:

On a busy Saturday afternoon in a shopping centre in Rotterdam a bomb attack is committed. Miraculously no one is killed, but 220 people are injured and many of them are severely injured. 38 people are in the hospital in a critical condition. Shortly after the attack, it is claimed by the right-wing extremist group 'Dutch First'. They warn that more attacks will be committed if the government does not take serious measurements against, as they call it, 'the flooding of the Netherlands by immigrants'. The government announces that they will not give in to the pressure of the terrorists and promises to find the attackers and to imprison them. The Dutch community is asked to continue their normal daily lives and to be extra alert on suspect behaviour.

The respondent and the people in his/her surroundings have not been directly affected by the bomb attack.

- 51. I avoid public places where many people are present
- 52. On the street and in public places I will pay extra attention to suspect people and suspect bags
- 53. I gather as much information as possible about this bomb attack
- 54. To which extent do you think you will be affected by the bomb attack?

Collapse part of the Nieuwe IJsselbrug

Scenario:

On the motorway A28, on a weekday before the afternoon rush hour, a part of the Nieuwe IJsselbrug in the direction of Meppel has collapsed. The damage is enormous. At the time of the accident about 50 cars were driving on one half of the bridge. Some of them have fallen into the water. Quickly it becomes clear that there are many victims. Eight people have died, 62 people are injured and many of them are severely injured. Twelve people are in the hospital in critical condition. Although much is unclear about the cause of the collapse, it is quickly established to be carbonation. After examination in the two weeks following the accident the Research Council for Safety establishes that the collapse was indeed caused by carbonation. It appears that negligent maintenance of the bridge has led to carbonation. There is much unrest in society caused by this news: which other places involve negligent maintenance and how likely is it that another disaster like this will happen again? The government starts a large-scale investigation.

- 55. I avoid driving over bridges, viaducts and through tunnels as much as possible.
- 56. I gather as much information as possible regarding this collapse.

Factual questions about disasters

57. A pandemic flu happens once every 100 years*
58. A pandemic flu can only break out in the autumn*
59. In which year did the last dike break in the Netherlands take place?*
60. The *Oosterscheldekering* is situated in South-Holland*
61. In which year did the tsunami in Asia take place?*
62. Which city was heavily damaged by Hurricane Katrina?*
63. 200,000 people were killed due to the earthquake in Haiti in January 2010*
64. How many airplanes were crashed into the Twin Towers on 11 September 2001?*
65. What is the name of the memorial sign where the attack of Queensday 2009 took place?*
66. In which year did the attacks on the London subway and bus take place?*
67. Where did the assassination of Pim Fortuyn take place?*
68. Is the IRA a protestant opposition wing?*
69. Afghanistan was invaded in order to take down the regime of Bin Laden*
70. The attacks of March 2004 on the underground of Madrid, Spain were claimed by ETA*
71. Which cargo aircraft crashed in de Bijlmer?*
72. Where did the fireworks disaster take place?*
73. During an electricity network shutdown in the Bommeler & Tielerswaard more than 40,000 households had to go without electricity*
74. How many nuclear power reactors are there in the Netherlands?*
75. When was the fire in the café in Volendam?*
76. A chemical disaster can lead to serious physical problems many years after exposure*
77. How long does an electricity network shutdown generally last?*

Protocol Resilience Monitor

Objective

The objective of the Resilience Monitor is to analyse the degree to which Dutch people are able to recover from a disaster or shocking event. The measuring tool is administered individually.

The present Resilience Monitor can serve a practical goal when implemented to establish psychosocial resilience (whether after disasters or crises, whether for different groups of population). From a research perspective it can serve as a basis on which the underlying mechanism of psychosocial resilience can be determined.

The monitor can be used by scientists as well as by policymakers. This operationalisation protocol attempts to offer guidance in the choices that have to be made in this process.

Short versus long version

It is possible to use a short as well as a long version of the Resilience Monitor. The long version consists of 84 questions, while the short version counts 52 questions. The short version is based on the results of the present research. From this research it was concluded that questions regarding Factual Knowledge and four questions from Psychological Resilience and Social Context did not contribute to the final model of psychosocial resilience.

Using the shorter version was done for mainly practical reasons; a shorter questionnaire costs less time to fill out and to analyse. The longer version is predominantly interesting on a research level. By using the complete questionnaire the results can be compared to other (international) studies. An additional reason to use the longer version is that respondents showed a lot of interest for the Factual Knowledge questions. They were considered amusing and motivated them to look up the answers after finishing the questionnaire. This causes respondents to continue thinking about the subject after participating in the research.

Use

The Resilience Monitor can be easily implemented by distributing the questionnaire amongst people from the target group(s) to be examined. Consequently, the choice can be made to use a written questionnaire or an online survey. Both procedures have advantages and disadvantages.

A written questionnaire presents the options of sending the questionnaire by mail or administering the questionnaire by going from door-to-door. Both methods will render a relatively high response rate, but are very labour-, cost- and time intensive. Moreover, the questions from the resilience monitor can be experienced as (very) personal – the presence of the person who administers the questionnaire can therefore be disturbing.

Conducting the questionnaire online allows respondents to fill out the questionnaire in their own time in a more comfortable way. It is also a relatively inexpensive and quick procedure. Another advantage of using an online survey is that the response is complete. Seeing as respondents cannot continue to the next question without having answered the previous one. A disadvantage of the online survey is that (in the Netherlands) it is difficult to obtain a completely representative sample. Research panels often include an overrepresentation of higher educated, elderly people and autochthonous Dutch people. Therefore, on several socio-economic factors the sample will not be representative. This can be solved by (i) openly and honestly reporting these shortcomings (ii) taking this into account when weighing the data for these factors.

A third possibility is to administer the questionnaire dually. This allows respondents to fill out the written or online questionnaire. Accordingly, disadvantages of choosing either a written or online survey can be avoided. This procedure is, however cost- and time intensive.

Selecting a research bureau

In the present research the option of an online questionnaire was chosen. Several research bureaus can assist during this procedure. They usually use their own research panels consisting of people or households from which samples are taken to participate in a research. When selecting a research bureau it is important to pay attention to the following points:

- Size of research panel. A larger panel does not have to be qualitatively better, but offers more possibilities to achieve a representative sample.
- Manner in which the research panel is compiled. An important point is whether it is possible for people to enrol or whether potential members have to be invited by the research bureau. The second method prevents double memberships or participation of 'professional respondents' in the panel: respondents who apply to many panels and studies in order to earn money. They usually fill out a questionnaire in a less serious manner;
- Does the research bureau/panel meet the standards of quality, like the international ISO 252:2007 certification? Accordingly, also take into account comparative research such as the research conducted by NOPVO;
- How is the sample survey administered? This is important so as to allow the results to be generalised.

Testing the questionnaire

When the decision is made to deviate from the present questionnaire as indicated in the annex, it is recommended to test the adapted questionnaire amongst potential respondents. Such a test gives an idea of whether the respondents understand the questions (and the response categories), what they think of the (subject) of the questionnaire (interesting, vague, difficult, fun, original) and how they feel while they are filling out the questions (uncomfortable, interested).

It is possible to conduct this test in a qualitative, quantitative, or dual way. In the present research the choice was made to do a qualitative test. This way, a small group of respondents can participate in taking a more in-depth look at the questionnaire and possible problems, although they do not have to be representative for the whole group. To solve the problem of representativeness, a dual test can be done, in which a relatively large number of people test the questions online and a small number of people is being interviewed.

Respondents prefer to see the 'I do not know'-category added. However, this is not always wise to do. Firstly, because such categories will turn up as missing values in the data analysis. Secondly, adding categories when working with (internationally) validated tools makes it more difficult to compare to prior research.

Furthermore, based on a test survey one can consider to formulate questions differently. Also in this respect, if questions are adapted it becomes more difficult or impossible to compare results of previous research when using (internationally) validated tools. By reformulating a question, it can also be interpreted differently or get another meaning.

On the whole, it should be carefully considered whether adapting the questions and/or response categories is worth losing the option of comparing to data from other research.

Issues to consider in questions about factual knowledge

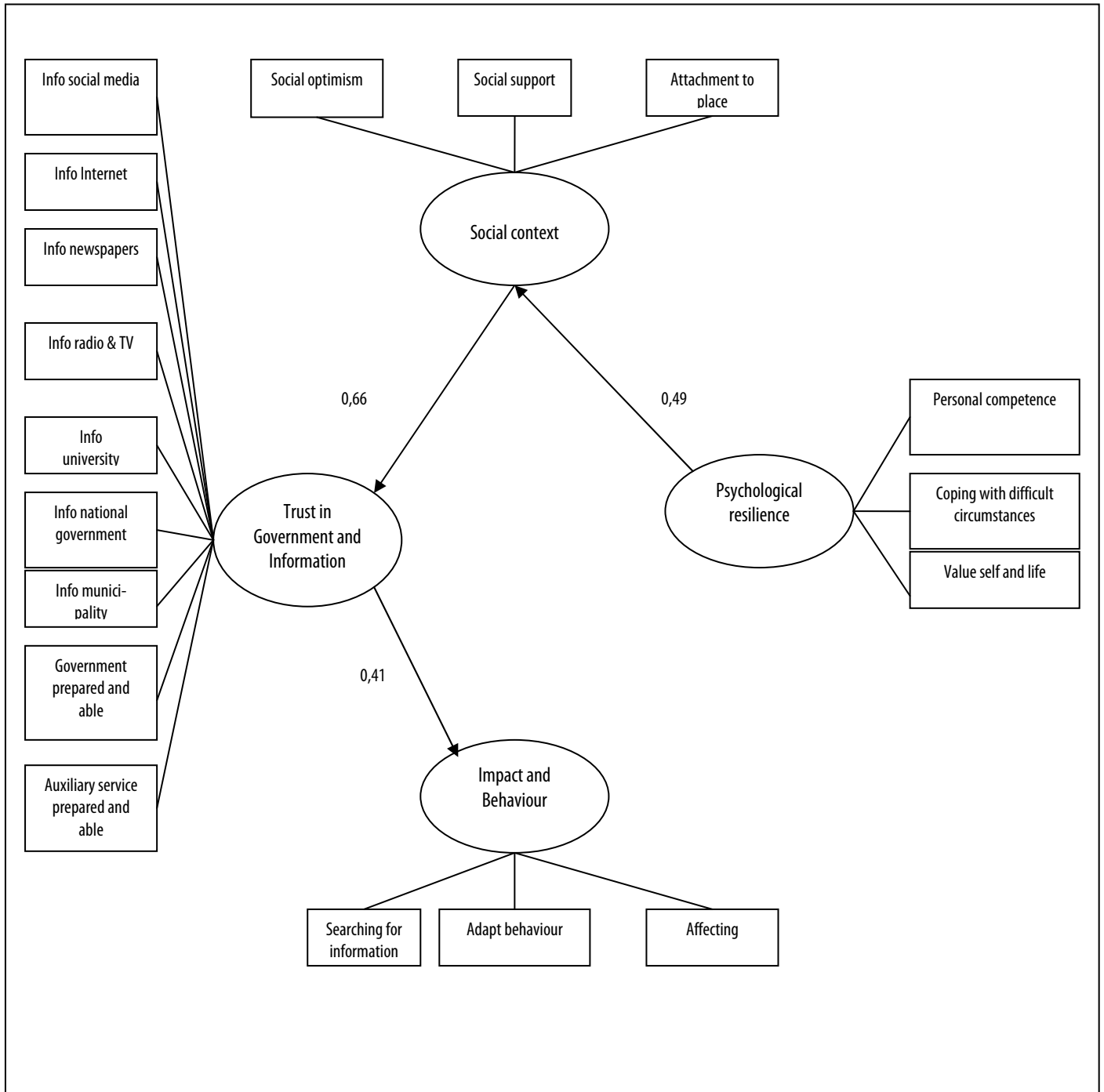
Regarding the scenarios and the questions concerning factual knowledge it is essential to stay close to the practical current affairs. Has a disaster or a shocking event taken place, which can be used as a frame of reference by the respondents? It is important to make sure that the questions do not have a negative effect on the respondent or damage his/her psychological recovery. Do not use shocking events that have taken place in the recent past (for example < 1 year ago). Another solution can be to explicitly indicate at the beginning of the questionnaire that questions about a specific event will be asked. This allows the respondent to prepare him- or herself or to quit.

For the factual knowledge response categories it is important that the correctness of the answers to the questions is not disputable. This is sometimes difficult to assess, in particular for recent events

where facts only become clear at a later stage. When conducting the pilot of the current questionnaire a question was included concerning the number of victims caused by the earthquake in Haiti at the beginning of 2010. At the time the questionnaire was made, the official number of victims was determined at 200,000. However, at the time of publication of this research, this number is disputed and is expected to be much higher.

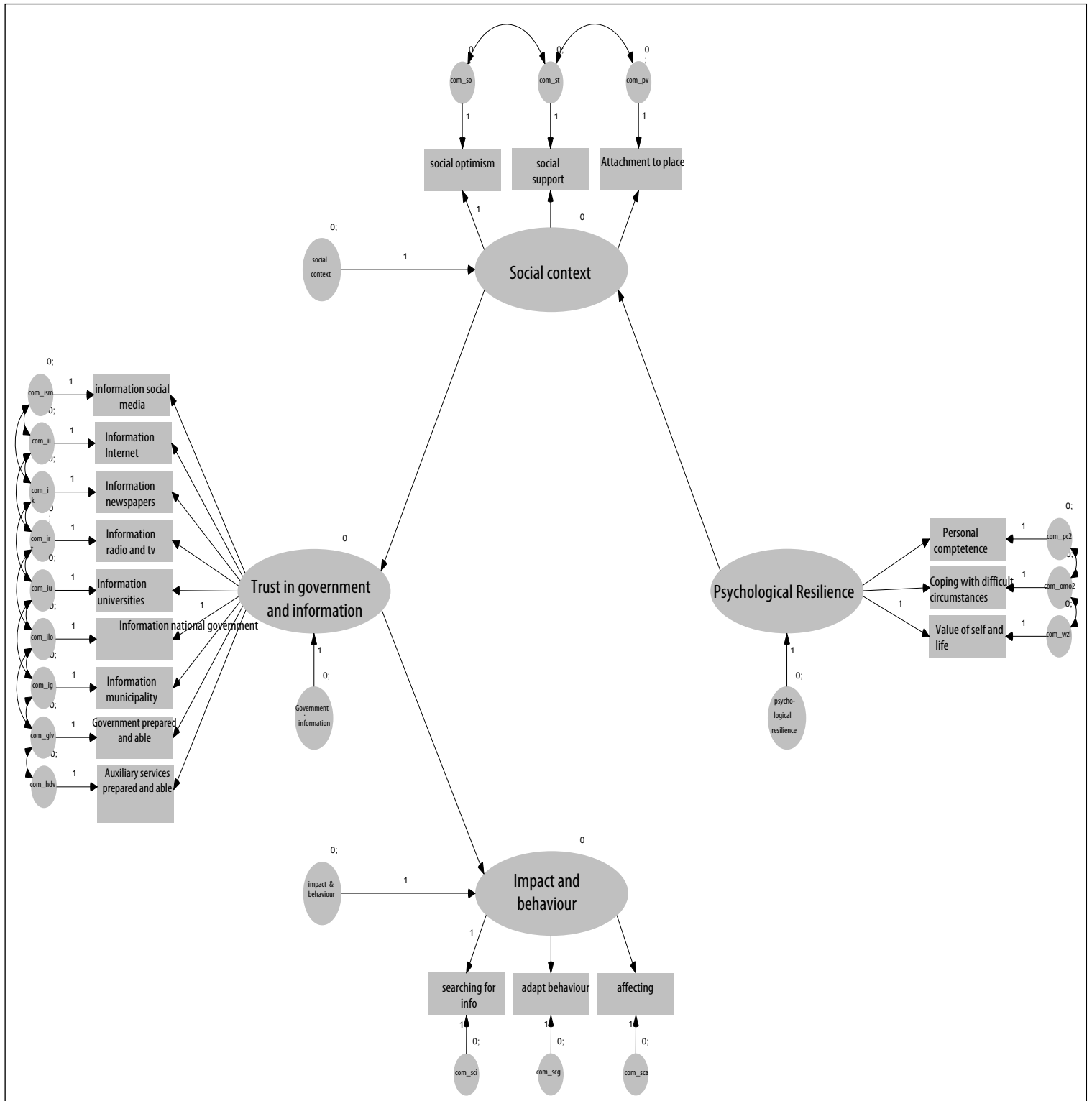
Annex 2. Model psychosocial resilience after disasters

Figure 2a Simplified model of psychosocial resilience after disasters



Please note: the arrows in 2a. and 2b. do NOT represent causation; it indicates that if a construct increases by 1 this leads to an increase of x in another construct. It can be assumed that these connections also run the other way around.

Figure 2b SEM-model of psychosocial resilience after disasters



Annex 3. Methods literature search

During the period April-September 2009 a literature search was conducted in databases Pubmed, Embase and Picarta. Additionally, references of key publications were examined for relevant sources.

Publications were included when they: contained a definition of resilience, provided a theoretical approach on resilience and/or gave insight in the factors associated with resilience.

Three different searches were conducted in English. The first one is conducted by combining the keywords 'resilience', 'definition', 'concept' and/or 'theory'. This resulted in 1097 hits, of which 723 articles have been reviewed by their title after overlap between databases was removed. Articles with a medical, ecological or biological background were kept outside of the scope of this research. Book reviews were not included either. This resulted in 108 potential publications, which were included or not based on the abstract.

A second search is conducted where the keyword 'resilience' is combined with 'factors', 'aspects' and 'measurement', resulting in 1836 hits. Removing articles that had already been found in the first search or were double in the current search, led to 607 articles that were further examined. Of these articles the majority appeared to have a medical, ecological or biological background or were book reviews. 158 articles were evaluated based on the abstract. To be included, they had to discuss information on factors associated with resilience, preferably by means of field research or by validating a measuring tool.

A final search focused on the role of the government and information. This will be important in the context of a disaster. Keywords used in the search relating to 'resilience' were: 'community', 'disaster', 'government' and 'communication'. This resulted in 1122 hits. After removing the duplicates or those involving medical, ecological or biological disciplines or book reviews, 93 publications were reviewed according to the abstract. Articles were included when they provided a definition of 'resilience' in a specific context or when they contained (field) research regarding the influence of social systems on individual psychosocial resilience.

Of the total of 313 publications that were regarded as relevant, eventually 55 were used for this research. This literature is published between 1989 and 2009, more than half of the publications (40) dates from the period 2005-2009. Mainly literature in the English language was used, although several Dutch articles were included.

Annex 4. Overview Definitions

	Author	Level of analysis	Definition
1	Adger, 2000	community	The ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change.
2	Adger <i>et al.</i> , 2005		The capacity of linked social-ecological systems to absorb recurrent disturbances such as hurricanes or floods so as to retain essential structures, processes, and feedbacks.
3	Ahmed <i>et al.</i> , 2004	individual	The observation that some individuals, in spite of adverse circumstances, do not develop negative outcomes but overcome life's hazards.
4	Ahmed <i>et al.</i> , 2004	community	Those features of a community that in general promote the safety of its residents and serve as a specific buffer against injury and violence risks and, more generally, adversity.
5	APA, 2005	individual	Process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of stress – such as family and relationship problems, serious health problems or workplace and financial stressors. It is bouncing back from difficult experiences.
6	Berke & Campenella, 2007	community	The ability to survive future natural disasters with minimum loss of life and property, as well as the ability to create a greater sense of place among residents; a stronger, more diverse economy; and a more economically integrated and diverse population.
7	Block & Kremen (1996)	individual	The capacity to modulate effectively and monitor an ever-changing complex of desires and reality constraints
8	Bonanno, 2004	individual	The ability to maintain a stable equilibrium.
9	Bonanno <i>et al.</i> , 2007	individual	Having either no PTSD symptoms or one symptom
10	Bonanno & Mancini, 2008	individual	The ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially highly disruptive event such as the death of a close relation or a violent or life-threatening situation to maintain relatively stable, healthy levels of psychological and physical functioning, as well as the capacity for generative experiences and positive emotions.
11	Butler <i>et al.</i> , 2009	individual	Maintenance or achievement of a relatively low level of distress and/or a high level of psychological well-being.

12	Conner <i>et al.</i> , 2003	individual	The possession of selective strengths or assets to help an individual survive adversity
13	Connor & Davidson, 2003	individual	A measure of stress coping ability
14	Colten <i>et al.</i> , 2008	community	A community or region's capability to prepare for, respond to and recover from significant multihazard threats with minimum damage to public safety and health, the economy and national security.
15	Cutter & Emrich, 2006	individual	The ability to adequately recover from hazards
16	Egeland <i>et al.</i> , 1993 in: Sonn & Fisher, 1998	individual	The capacity for successful adaptation, positive functioning or competence [...] despite high-risk status, chronic stress, or following prolonged or severe trauma.
17	Fischer & Ai, 2008	individual	The ability to bounce back from adversity
18	Friborg <i>et al.</i> , 2003	individual	A relatively good outcome despite experiencing situations that have been shown to carry significant risk for developing psychopathology
19	Ganor & Ben-Lavy, 2003	individual/ community	The ability of individuals and communities to deal with a state of continuous, long-term stress, which causes gaps between environment stimuli and their functional coping behaviour.
20	Greeff & Loubser, 2008	individual/ community	The ability to withstand disruptive life challenges and bounce back from adversity
21	Holling, 1973 in: Folke, 2006	individual/ community	The persistence of relationships within a system; a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist.
22	Keim, 2008	individual	The capacity to cope with or recover from the consequences of disasters.
23	Masten <i>et al.</i> , 1990	individual	The process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances.
24	Masten, 2007	community	a broad systems construct, referring to the capacity of dynamic systems to withstand or recover from significant disturbances.
25	Moser, 2008	individual/ community	The capacity to withstand change for some time, but also, past a certain point, to transform while continuing or regaining the ability to provide essential functions, services, amenities or qualities.

26	Lemeyre <i>et al.</i> , 2005	individual/ community	A process or the attainment of positive outcomes at the individual, family, and community levels despite adversity (e.g., natural disaster, terrorist attack)
27	Lundman <i>et al.</i> , 2007	individual	A personality characteristic that moderates negative effects of stress and promotes adaptation.
28	Luthar <i>et al.</i> , 2000	individual	A dynamic process encompassing positive adaptation within the context of significant adversity.
29	Norris & Stevens, 2007	individual/ community	A positive trajectory of adaptation after a disturbance, stress, or adversity
30	Norris <i>et al.</i> 2008	community	A process linking a network of adaptive capacities (resources with dynamic attributes) to adaptation after a disturbance or adversity.
31	O'Brien <i>et al.</i> , 2006	community	The capacity of a system, community or society to resist or to change in order that it may obtain an acceptable level in functioning and structure. This is determined by the degree to which the social system is capable of organizing itself and the ability to increase its capacity for learning and adaptation, including the capacity to recover from a disaster
32	Paton <i>et al.</i> , 2001	community	The personal and community characteristics and processes that promote a capability to 'bounce back' and to use physical and economic resources effectively to aid recovery following exposure to hazard activity.
33	Pfefferbaum, 2005 in: Norris <i>et al.</i> , 2008	community	The ability of community member to take meaningful, deliberate, collective action to remedy the impact of a problem, including the ability to interpret the environment, intervene and move on.
34	Rutter, 2007	individual	The phenomenon that some individuals have a relatively good outcome despite suffering risk experiences that would be expected to bring about serious sequelae
35	Tobin, 1999	community	Societies which are structurally organized to minimize the effects of disasters, and, at the same time, have the ability to recover quickly by restoring the socio-economic vitality of the community.
36	Smith <i>et al.</i> , 2008	Individual	Returning to the previous level of functioning (e.g., bouncing back or recovery)
37	Walker, 2004 in: Berkes, 2007	community	Capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks.
38	Wagnild, 2003	individual	A positive personality characteristic enhancing individual adaptation
39	Wildavsky, 1991 in: Manyena, 2006	individual/ community	The capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back.

