Disasters as a Source of Personal Growth? Insights from Longitudinal Research

Klaus Boehnke
## From the Wikipedia Entry “Lists of Disasters”

**Disasters with at least 1000 (estimated) deaths for the last ten years.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Sinking of MS al-Salam Boccaccio, Red Sea</td>
</tr>
<tr>
<td>2008</td>
<td>Cyclone Nargis, Myanmar</td>
</tr>
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<td>2009</td>
<td>Sri Lankan Civil War</td>
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<td>2010</td>
<td>Haiti earthquake</td>
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<td>2010</td>
<td>Russian heat wave</td>
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<td>2011</td>
<td>Tōhoku earthquake and tsunami</td>
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<td>2011 onward</td>
<td>ISIL activities</td>
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<tr>
<td>2011 onward</td>
<td>Syrian Civil War</td>
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<td>2013</td>
<td>Collapse of the Rana Plaza, Bangladesh</td>
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<tr>
<td>2013</td>
<td>Typhoon Haiyan</td>
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<td>2014 onward</td>
<td>War in Donbass</td>
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<tr>
<td>2015</td>
<td>Mina stampede, Mecca</td>
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<tr>
<td>2015</td>
<td>Nepal earthquake</td>
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<tr>
<td>Earth</td>
<td>Air</td>
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<td>------------------------------</td>
<td>---------------------------------</td>
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<tr>
<td>Avalanches</td>
<td>Blizzards</td>
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<tr>
<td>Dam failures</td>
<td>Acid rain</td>
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<tr>
<td>Ecological</td>
<td>Aircraft accidents</td>
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<tr>
<td>irresponsibility</td>
<td>Cyclones</td>
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<tr>
<td>Earthquakes</td>
<td>Hijackings</td>
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<tr>
<td>Road and train accidents</td>
<td>Dust storms</td>
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<tr>
<td>Erosions</td>
<td>Meteorite and</td>
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<tr>
<td>Landslides</td>
<td>planetary shifts</td>
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<tr>
<td>Eruptions</td>
<td>Radioactive cloud</td>
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<tr>
<td>Radioactive substances</td>
<td>and soot</td>
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<tr>
<td>Toxic waste disposal</td>
<td>Thermal shifts</td>
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<td></td>
<td>Urban smog</td>
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<td></td>
<td>Tornadoes</td>
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<tr>
<td>Animate Creatures</td>
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<tr>
<td>Endemic disease</td>
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<tr>
<td>Epidemics</td>
<td></td>
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<tr>
<td>Famine</td>
<td></td>
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<tr>
<td>Overpopulation</td>
<td></td>
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<tr>
<td>Plague</td>
<td></td>
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<tr>
<td>Pestilence</td>
<td></td>
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<tr>
<td>Design flaws</td>
<td></td>
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<tr>
<td>Equipment problems</td>
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<tr>
<td>Illicit manufacture and use</td>
<td></td>
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<tr>
<td>of explosives and poisons</td>
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<tr>
<td>Plant accidents</td>
<td></td>
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<tr>
<td>Criminal extortion by virus</td>
<td></td>
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<tr>
<td>and poisons</td>
<td></td>
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<tr>
<td>Guerilla warfare</td>
<td></td>
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<tr>
<td>Hostage-taking</td>
<td></td>
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<td>Sports crowd violence</td>
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<tr>
<td>Terrorism</td>
<td></td>
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<tr>
<td>Warfare</td>
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</table>
Core Question

How can we study long-term effects of disasters?

From the viewpoint of study design, disasters are natural experiments.

The simplest form of an experiment has the following form:

[R] Randomization of Participants

O Observation
X Treatment
O Observation

O Observation

O Observation
What does this very simple experimental design mean for how one can study long-term effects of disasters?

Studies must enable two modes of comparison, namely to assess variables of interest before and after the disaster, and to assess treatment recipients and treatment non-recipients.

Given that disasters cannot be planned, random assignment of study participants to the treatment or the control group cannot be implemented. Thus natural experiments (disasters) can only be studied quasi-experimentally.
Moreover, natural experiments are by definition field experiments; they cannot be brought into laboratory setting (in any ethically viable way).

This means that, unlike in lab experiments, where the context is held constant, context also has to be assessed in studies of long-term effects of disasters. It matters whether an earthquake takes place in Haiti or in Italy.

However, contexts do not only differ at a given time, they also change over time, and might change differently for different contexts.

Context and context change have to be measured independently of study participants!
From a design perspective the demand that context has to be measured independently means that one has to de-confound context and treatment as far as possible:

\[
\begin{array}{ccc}
  & C_1 & \\
  \text{Observation} & O & X & O \\
  \text{Treatment} & O & X & O \\
  \text{Observation} & O & O & O \\

  & C_2 & \\
  \text{Observation} & O & X & O \\
  \text{Treatment} & O & O & O \\
  \text{Observation} & O & O & O
\end{array}
\]
One would, thus, want to have study participants from one and the same context who were stricken and not stricken by the disaster, and participants of both types from a different context.

Earthquake victims and non-victims from Japan and from Italy would be an example.

Obviously a study of long-term disaster effects cannot work with one measurement point before a disaster and one after a disaster. The study needs an extended longitudinal design.
It needs to be acknowledged that the implementation of a longitudinal design brings in ‘time’ as an additional context, in Bronfenbrenner’s terms the ‘chronosystem’.

People change and contexts change!
For an ideal-type study of long-term effects of disasters this means that there must be an assessment of change before and after the treatment. Consequentially such a study needs minimally two assessments before and two assessments after the disaster.

Bringing in time as a context has the consequence that not only calendric time is included but also individual time, i.e., age. People of different ages react differently to disasters as do people at different historic times.

This calls for the inclusion of people born at different times as a design element.
<table>
<thead>
<tr>
<th></th>
<th>C(_1)/Cohort1</th>
<th>C(_1)/Cohort2</th>
<th>C(_1)/Cohort3</th>
<th>C(_2)/Cohort1</th>
<th>C(_2)/Cohort2</th>
<th>C(_2)/Cohort3</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
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<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>O</td>
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<td>O</td>
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<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
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<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
To take ideal-typing yet a step further, studies as described on the previous slide should be repeated at least one other historic time.

The complexity of designing internally and externally valid studies of long-term effects of disasters, makes it obvious that such studies cannot easily be started anew and that it makes no real sense to start them as after-only studies when a disaster has happened.

What is utterly advisable is to utilize existing datasets to come close to studying long-term impact of disasters adequately.
One would try to identify ongoing or concluded longitudinal studies that assessed people of different ages several times before and after a disaster. Candidates could be

- British Household Panel Survey (BHPS), UK
- Household, Income and Labour Dynamics in Australia Survey (HILDA), Australia
- Korea Labor Income Panel Study (KILPS), Korea
- Panel Study of Income Dynamics (PSID), USA
- Socio-Economic Panel (SOEP), Germany
- Survey of Labour and Income Dynamics (SLID), Canada
- Swiss Household Panel (SHP), Switzerland
- Russia Longitudinal Monitoring Survey (RLMS-HSE), Russia

All these studies are usable for academics without extensive costs. They are accessible either through the so-called Cross-National Equivalent File at Ohio State University.
However, these studies typically contain only few instruments that assess mental health (if at all). It may thus be more rewarding to look into other types of longitudinal studies that do, however, have the drawback that many of them do work with special populations, sometimes even with convenience samples. Also not all of them are equally easily accessible.

On the next slides you find a fairly random selection of longitudinal mental health studies from the US. In them one could—to offer a very practical example—search for data that studied people from Louisiana and from another state in the US before and since Hurricane Katrina
Antonucci: Social Relations and Mental Health Over the Life Course
Brown: Life-Span Development of Educated Women
Earls: Human Development in Chicago Neighborhoods
Eccles: Ontogeny of Self and Task Concepts, Activity Choice, and School Behavior
Eccles: Maryland Adolescent Development in Context Study
Eccles: Michigan Study of Life Transitions
Furstenberg: Philadelphia Family Management Study
Hagen: Resiliency and Vulnerability Among Abused and Neglected Children in Foster Care
Huesmann: Evaluating the Metropolitan Area Child Study of Aggression
Huesmann: Cross-Generational Influences on the Development of Aggression
Huston: New Hope Child and Family Study of Poverty and Employment
Kaplan: Alameda County Study of Health and Aging
Lozoff: Iron Deficiency Anemia and Infant Behavior
McLoyd: Flint Study of Maternal Work and Family Processes
Myers;Young Adults with Diabetes: A Follow-Up Study
Pintrich: Competence and Commitment in Jr. High School
Sameroff: Rochester Longitudinal Study of Multiple Social Risk
Stafford: Panel Study of Income Dynamics
Schulenberg: Stability and Change in Alcohol Use During the Transition to Young Adulthood
Schulenberg: Countering Pressures Related to Adolescent Alcohol Misuse
Stewart: Women's Life Paths Study
Stewart: Radcliffe Longitudinal Study of Women Life Courses
Thornton: Intergenerational Panel Study of Parents and Children
Zimmerman: School Drop-out and Drug Use
Zucker: Risk and Protective Factors for Substance Abuse
Such data sets would then hopefully be matchable in some way or another with data from another context, in which a similar (or even different) disaster took place.

Strong advice: If your primary focus is NOT on victim relief in your home country, but on a better understanding of what disasters ‘do’ to human beings in the long-run, DO NOT start a new study but delve into existing data. There are wonderful accessible long-term longitudinal data around that can be exploited for the generation of new knowledge! Even from ‘way back when’ so that they allow comparisons across different historic times.
Even if you primarily want to look at home country victims, do not start a new ex-post victim study if you are interested in long-term consequences. Try to contact all local colleagues who may have ongoing longitudinal studies. Ask them for permission to do secondary analyses of their data!
Own Study

- “Biography” of the Study
- Conceptual Considerations
- Hypotheses
- Sample
- Instruments
- Analytic Approach
- Results
  - Descriptives
  - Validation of Dependent Variable
  - Hypothesis Testing
  - Attrition Analyses
- Discussion and Conclusions
Own Study—Waves of Data Gathering

- 1985
- 1988/89
- 1992
- 1995/96
- 1999
- 2002/03
- 2006
- [2009/10]
- [2013]
- [NOW]
Conceptual Considerations

- Mental Health (Anxiety, Worry, Happiness)
- Cognitive Phenomenological Stress Theory (Lazarus)
- Agency Research
Hypotheses

- Activists have lower (self-related) micro-worries at the onset of the study (H1)
- Activists have higher macroworries, concerned with larger entities, at the onset of the study (H2)
- Activists who appraised the threat of nuclear war as high in 1985 will report better mental health 21 years later than non-activists and activists who did not perceive a high threat (H3)
- Activists will express relatively more macro-worries than non-activists in mid-adulthood (H4).
Sample

<table>
<thead>
<tr>
<th>Wave</th>
<th>Year of Data Gathering</th>
<th>N</th>
<th>Retention Rate in Percent</th>
<th>Age Range (Average Age)</th>
<th>Percent Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Summer 1985</td>
<td>1492</td>
<td></td>
<td>8-20 (14.5/13.9)</td>
<td>54</td>
</tr>
<tr>
<td>2</td>
<td>Winter 1988/89</td>
<td>837</td>
<td>56</td>
<td>11-23 (17.7/17.5)</td>
<td>56</td>
</tr>
<tr>
<td>3</td>
<td>Summer 1992</td>
<td>541</td>
<td>65</td>
<td>14-26 (21.3/21.1)</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>Winter 1995/96</td>
<td>367</td>
<td>68</td>
<td>18-30 (24.7/24.7)</td>
<td>57</td>
</tr>
<tr>
<td>5</td>
<td>Summer 1999</td>
<td>241</td>
<td>65</td>
<td>21-34 (28.5/28.2)</td>
<td>58</td>
</tr>
<tr>
<td>6</td>
<td>Winter 2002/03</td>
<td>201</td>
<td>83</td>
<td>24-36 (31.7/31.5)</td>
<td>61</td>
</tr>
<tr>
<td>7</td>
<td>Summer 2006</td>
<td>220</td>
<td>109b</td>
<td>28-40 (35.0/35.0)</td>
<td>60</td>
</tr>
</tbody>
</table>

a The left figure indicates the average age for the particular wave, the right figure the average age in the longitudinal core sample.
b In addition to Wave 6 participants drop-outs after Wave 5 were re-contacted. Twenty-seven re-joined the study, eight Wave 6 participants dropped out.
Instruments

- Worries
  (Goldenring & Doctor, 1986; Boehnke, Schwartz, Stromberg, & Sagiv, 1998)
- Activism
- Appraisal of Threat of Nuclear War
- Trier Mental Health Scale
  (Becker, 1989)
- Psychosomatic Symptoms
  (Grob, 1993)
- Revised Children’s Manifest Anxiety Scale
  (Boehnke, Silbereisen, Reynolds, & Richmond, 1987)
- Happiness
  (Fordyce, 1988)
Instruments—Worries

Macroworries

- How much do you worry about …
  - environmental destruction
  - nuclear power plant accidents
  - hunger in the world
  - overpopulation problems
  - nuclear war

- 4-point response scale (0-3) Wave 1 to 3
  (scores multiplied by 4/3)
- 5-point response scale (0-4) Wave 4 to 7

- Cronbach’s $\alpha$ ranging from .65 to .78 across the seven waves (no time-related trend)
**Instrument—Worries**

**Microworries**

- How much do you worry about ...
  - work- or studies-related problems
  - being unattractive
  - becoming the victim of a violent crime
  - your parents’ death
  - your own death

- 4-point response scale (0-3) Wave 1 to 3
  (scores multiplied by 4/3)

- 5-point response scale (0-4) Wave 4 to 7

- Cronbach’s $\alpha$ ranging from .61 to .69 across the seven waves (no time-related trend)
**Instruments—Worries**

**Scale Score Calculation**

Scale scores were calculated by averaging across the five pertinent items.

Macroworries and Microworries are typically correlated substantially, reflecting personal tendencies to worry.

In order to have ‘pure’ measures of the two types of worries, both were regressed upon each other, and standardized residuals with a mean of 0 and a variance of 1 were generated both for macroworries and microworries.

Grand sample raw scale score means per wave were then added to the standardized residual scores, to retain the time-dependent mean structure.
Instruments—Activism

Life-Time Prevalence of Participation in Activities of the German Peace Movement at Wave 1

- Have you ever participated in activities of the peace movement?
- Dichotomous response format (0 = ‘no’ / 1 = ‘yes’)
Instruments – Appraisal of Threat of Nuclear War

Likelihood of Nuclear War

- A nuclear war will take place...
  - next year
  - within the next five years
  - within the next 20 years
  - in my life-time.

- 4-point response scale, ranging from “surely not” (0) to “quite surely” (3)

Means of the four items are increasing in similarly-sized increments, .45, .85, 1.34, and 2.12

- Guttman’s $\lambda = .74$; Cronbach’s $\alpha = .71$
Instruments – Appraisal of Threat of Nuclear War

**Calculation of Scale Score**

\[
[(Item 1 \times 4) + (Item 2 \times 3) + (Item 3 \times 2) + (Item 4 \times 1)]
\]

The mean of that variable was 8.96 with a median of 10, scores ranging from 0 to 24. This transformation allowed us to compare two equally-sized groups with a high and a low appraisal of the likelihood of a nuclear war in 1985.
Trier Mental Health Scale

- 20 items
- Sample item, “It happens that I can’t stand myself”
- 4-point response scale, ranging from ‘never’ (0) to ‘always’ (3)
- used Wave 3 to 7
- average Cronbach’s $\alpha = .90$
Psychosomatic Symptoms Checklist

- 8 items
- Sample item “Stomach ache”
- 4-point response scale, ranging from ‘never’ (0) to ‘frequently’ (3)
- used Wave 4 to 7
- average Cronbach’s $\alpha = .73$
Instruments—Manifest Anxiety

Revised Children’s Manifest Anxiety Scales
RCMAS-G
Shortened Scale

- 6 items
- Sample item “I am frequently out of breath”
- 4-point response scale, ranging from ‘completely false’ (0) to ‘completely true’ (3)
- used Wave 2 to 4
- average Cronbach’s $\alpha = .77$
Fordyce’s Happiness Indicator

- Single item
- “How happy or unhappy do you feel in general”
- 11-point response scale, ranging from ‘extremely unhappy’ (0) to ‘extremely happy’ (10)
- used Wave 4 to 7
- Means stayed almost constant over time and ranged from 6.98 to 7.12
Analytic Strategy

- Descriptive analyses for worry scales and their interrelation with other mental health and well-being indicators
- Latent growth modeling (Preacher, Wichman, MacCallum, & Briggs, 2008)
- Checks of possible consequences of selective attrition on findings
## Results

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</thead>
<tbody>
<tr>
<td>Microsocial Worries</td>
<td>1.97</td>
<td>1.86</td>
<td>1.89</td>
<td>1.52</td>
<td>1.48</td>
<td>1.43</td>
<td>1.36</td>
</tr>
<tr>
<td>Macrosocial Worries</td>
<td>2.95</td>
<td>3.05</td>
<td>2.87</td>
<td>2.25</td>
<td>2.09</td>
<td>2.02</td>
<td>1.92</td>
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</table>
## Results

<table>
<thead>
<tr>
<th>Mental Health/Well-Being Indicator</th>
<th>Same-Wave Microworries</th>
<th>Same-Wave Macroworries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifest Anxiety 1988/9</td>
<td>.36***</td>
<td>.12*</td>
</tr>
<tr>
<td>Manifest Anxiety 1992</td>
<td>.34***</td>
<td>.05</td>
</tr>
<tr>
<td>Manifest Anxiety 1995/6</td>
<td>.47***</td>
<td>.04</td>
</tr>
<tr>
<td>Mental Health 1992</td>
<td>-.35***</td>
<td>-.01</td>
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<td>Mental Health 1995/6</td>
<td>-.48***</td>
<td>.04</td>
</tr>
<tr>
<td>Mental Health 1999</td>
<td>-.50***</td>
<td>.04</td>
</tr>
<tr>
<td>Mental Health 2002/3</td>
<td>-.34***</td>
<td>.05</td>
</tr>
<tr>
<td>Mental Health 2006</td>
<td>-.37***</td>
<td>.01</td>
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</table>
## Results

<table>
<thead>
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<th>Same-Wave Microworries</th>
<th>Same-Wave Macroworries</th>
</tr>
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<td>Psychosomatics 1995/6</td>
<td>.31***</td>
<td>.12⁺</td>
</tr>
<tr>
<td>Psychosomatics 1999</td>
<td>.36***</td>
<td>.18**</td>
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<td>Psychosomatics 2002/3</td>
<td>.28***</td>
<td>.24***</td>
</tr>
<tr>
<td>Psychosomatics 2006</td>
<td>.27***</td>
<td>.12⁺</td>
</tr>
<tr>
<td>Happiness 1995/6</td>
<td>-.25***</td>
<td>.18**</td>
</tr>
<tr>
<td>Happiness 1999</td>
<td>-.16*</td>
<td>-.05</td>
</tr>
<tr>
<td>Happiness 2002</td>
<td>-.10</td>
<td>-.04</td>
</tr>
<tr>
<td>Happiness 2006</td>
<td>-.14⁺</td>
<td>.04</td>
</tr>
</tbody>
</table>
Results

\[ \text{PMA}^+ \quad M = 0.42/0.26 \]

\[ \mu = 2.10 \]

\[ \text{E-L} \]

\[ \text{E-C} \]

\[ \mu = -0.68 \]

\[ -0.17/-0.15 \]

\[ 0.27/(0.08)^* \]

\[ -0.47/-0.44 \]
Results
## Results

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Wave 1 to 3</th>
<th>Wave 1 to 4</th>
<th>Wave 1 to 5</th>
<th>Wave 1 to 7</th>
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</thead>
<tbody>
<tr>
<td><strong>Percentage of Activists</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>High Threat</td>
<td>45.0 %</td>
<td>40.0 %</td>
<td>35.2 %</td>
<td>42.2 %</td>
</tr>
<tr>
<td>Low Threat</td>
<td>33.5 %</td>
<td>34.1 %</td>
<td>31.1 %</td>
<td>26.4 %</td>
</tr>
<tr>
<td><strong>Micro-worries</strong></td>
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<tr>
<td>Level (Intercept)</td>
<td>2.20</td>
<td>2.74</td>
<td>2.12</td>
<td>2.84</td>
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<td>Change (Slope)</td>
<td>-.25</td>
<td>.11</td>
<td>-.55</td>
<td>-.54</td>
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<td><strong>Macro-worries</strong></td>
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<tr>
<td>PMA → Level (L)</td>
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<tr>
<td>High Threat</td>
<td>-.24***</td>
<td>.42***</td>
<td>-.14*</td>
<td>.27***</td>
</tr>
<tr>
<td>Low Threat</td>
<td>-.23***</td>
<td>.33***</td>
<td>-.13*</td>
<td>.18***</td>
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<tr>
<td><strong>PMA → Change (C)</strong></td>
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</tr>
<tr>
<td>High Threat</td>
<td>.53***</td>
<td>-.62***</td>
<td>.08</td>
<td>-.17*</td>
</tr>
<tr>
<td>Low Threat</td>
<td>.04</td>
<td>.53***</td>
<td>.09</td>
<td>-.24*</td>
</tr>
<tr>
<td><strong>Correlation L ↔ C</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Threat</td>
<td>-.20</td>
<td>-.05</td>
<td>-.51***</td>
<td>-.50***</td>
</tr>
<tr>
<td>Low Threat</td>
<td>-.15</td>
<td>-.03</td>
<td>-.55***</td>
<td>-.53***</td>
</tr>
</tbody>
</table>
Discussion

- All four hypotheses confirmed
Conclusions

- Political activism in adolescence secures life-time happiness (???????????)
To assume that humanity would annihilate itself through a nuclear war was quite common during the 1980s in many parts of the world.

How does this juvenile ‘life context’ affect political involvement and happiness of people in the long-run, who were adolescents in the 1980s?
Table 1
Sample Characteristics (1985-2010)

<table>
<thead>
<tr>
<th>Wave</th>
<th>Year of Data Gathering</th>
<th>n</th>
<th>Retention Rate in %</th>
<th>Average Age</th>
<th>Percentage of Women (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Summer 1985</td>
<td>3499a</td>
<td>---</td>
<td>14.2c</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1492b</td>
<td>---</td>
<td>14.5</td>
<td>54</td>
</tr>
<tr>
<td>2</td>
<td>Winter 88/89</td>
<td>837</td>
<td>56</td>
<td>17.7</td>
<td>56</td>
</tr>
<tr>
<td>3</td>
<td>Summer 1992</td>
<td>541</td>
<td>65</td>
<td>21.3</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>Winter 95/96</td>
<td>367</td>
<td>68</td>
<td>24.7</td>
<td>57</td>
</tr>
<tr>
<td>5</td>
<td>Summer 1999</td>
<td>241</td>
<td>58</td>
<td>28.5</td>
<td>61</td>
</tr>
<tr>
<td>6</td>
<td>Winter 02/03</td>
<td>201</td>
<td>61</td>
<td>31.7</td>
<td>61</td>
</tr>
<tr>
<td>7</td>
<td>Summer 2006</td>
<td>220</td>
<td>109d</td>
<td>35.2</td>
<td>60</td>
</tr>
<tr>
<td>8</td>
<td>Winter 09/10</td>
<td>203</td>
<td>92e</td>
<td>28.6</td>
<td>60</td>
</tr>
</tbody>
</table>

a Teilnehmer_innen der ersten Querschnittsuntersuchung; b Teilnehmer_innen, die Adressen angegeben hatten und so für eine mögliche längsschnittliche Untersuchungsteilnahme erreichbar waren; c Die Angabe bezieht sich auf das mittlere Alter in der gegebenen Erhebungswelle; d Zusätzlich zu den Teilnehmer_innen der Welle 6 wurden auch Teilnehmer_innen angeschrieben und um Wiederteilnahme gebeten, die ihre Teilnahme nach Welle 5 (vorübergehend) beendet hatten; e Erneut wurde alle 241 Teilnehmer_innen aus Welle 5 angeschrieben.
Instruments – Appraisal of Threat of Nuclear War

**Likelihood of Nuclear War**

- **A nuclear war will take place...**
  - ... next year
  - ... within the next five years
  - ... within the next 20 years
  - ... in my life-time.

- 4-point response scale, ranging from “surely not” (0) to “quite surely” (3)

Means of the four items are increasing in similarly-sized increments, .45, .85, 1.34, and 2.12

- Guttman’s λ = .74; Cronbach’s α = .71
Instruments – Political Involvement

One Item

(3) I am interested in politics and actively engaged.
(2) I am interested in politics but not active myself.
(1) I am not particularly interested in politics; it is one thing among many.
(0) I have no interest in politics whatsoever.
Instruments—Happiness

Fordyce’s Happiness Indicator

- Single item
  “How happy or unhappy do you feel in general”
- 11-point response scale, ranging from ‘extremely unhappy’ (0) to ‘extremely happy’ (10)
- used Wave 4 to 7
- Means stayed almost constant over time and ranged from 6.98 to 7.12
Figure 1
Probability of a nuclear war next year
Figure 2
Probability of a nuclear war during the next five years
Figure 3
Probability of a nuclear war during the next 20 years
Figure 4
Probability of a nuclear war later in the future
Figure 5
Political Involvement in 2010 (Wave 8)
Figure 6
Happiness in 2010 (Wave 8)
Abbildung 7
Latentes Wachstumsmodell mit latenten Variablen
Results

The 1985 to 2010 average latent subjective probability of a nuclear war expressed by people who were adolescents in the 1980s increases their political involvement in mid adulthood:

\[ \beta = .27 \]
The more the subjectively assessed probability of a nuclear war decreased between 1985 and 2010, the unhappier participants were in 2010:

\[ \beta = -.21 \]
(A) The higher the subjectively assessed probability of an anticipated disaster caused by human decision-making, the higher people’s mid adulthood political involvement.

(B) The long-term avoidance of cognitions about possible politically caused disasters reduces people’s satisfaction with their lives in mid adulthood.
Thank you very much for your attention!