

New Frontiers: Can Panel Studies Go DDI?

First Experiences in Documenting the German Socio-Economic
Panel Study with DDI 3.0

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IASSIST, Montréal, 17. May 2007

What is SOEP?

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What is SOEP?

DDI 3.0 and SOEP

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▶ **SO**cio-**E**conomic **P**anel Study

- ▶ Collect yearly representative microdata on **the same** households and persons in the Federal Republic of Germany since 1984 ...
- ▶ ...and since 1990 in East Germany.
- ▶ Measuring *Stability* and *Change* in living conditions.
- ▶ In 2005, there were nearly 12,000 households, and more than 21,000 persons sampled.
- ▶ Available for researchers in Germany **and** abroad
- ▶ More than 400 research groups currently using the data
- ▶ All documentation as well as variable and value labels are available in German and English
- ▶ Part of the Cross-National Equivalent File (CNEF)

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What do we measure?

- ▶ SOEP data cover a wide range of subjects including:
 - ▶ Personality traits
 - ▶ Occupational and family biographies
 - ▶ Employment, participation and professional mobility
 - ▶ Earnings
 - ▶ Health
 - ▶ Personal satisfaction
 - ▶ Household composition, living situation
- ▶ Questionnaires:
 - ▶ Household (each year, head of household)
 - ▶ Personnel (each year, each person age 17 or older)
 - ▶ Biography (asked only once)
 - ▶ Triggered Questionnaires (e.g. "Mother & Child", when giving birth)

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Ideal Structure of a Panel Survey

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“A data set containing observations on multiple phenomena observed over multiple time periods is called panel data.” (Wikipedia: Panel Data)

- ▶ The **same** persons or households are interviewed each year with the **same** instrument or questionnaire
- ▶ No change in documentation needed, except for updating the year
- ▶ However, life is not that easy ...

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SOEP: Principle Structure

- ▶ Most Data is on Person or Household Level (Dependence)
- ▶ Questionnaires and/or Variables are changing over time
 1. Improvement of instrument
 2. Changing real world
 3. Special Topics
 4. Changing Variable Names
- ▶ Principle Data Structure is Cross-Sectional
⇒ New Datasets for each new wave (by year)

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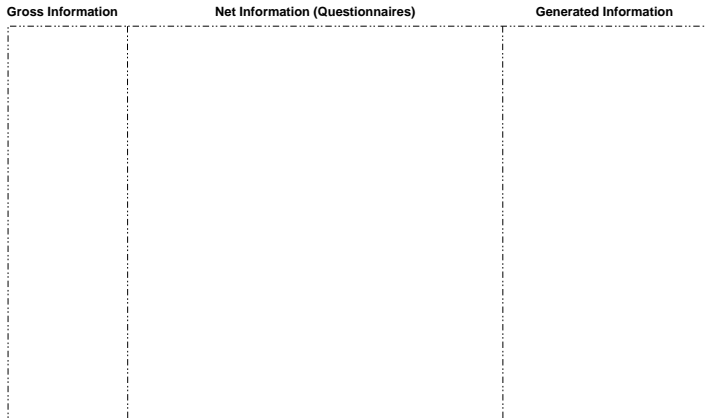
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SOEP: Principle Data Structure

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S: Wave specification: A, B, C, ... W for file names; where A=1984 ... W=2006

1: Waves G and H only; 2: Waves B through Q only; 3: Waves A through L only

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Gross Information	Net Information (Questionnaires)	Generated Information
<i>Individual Level</i>		
<i>Household Level</i>		

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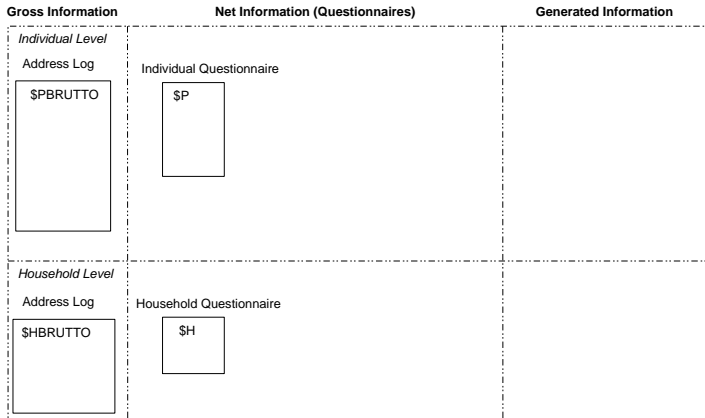
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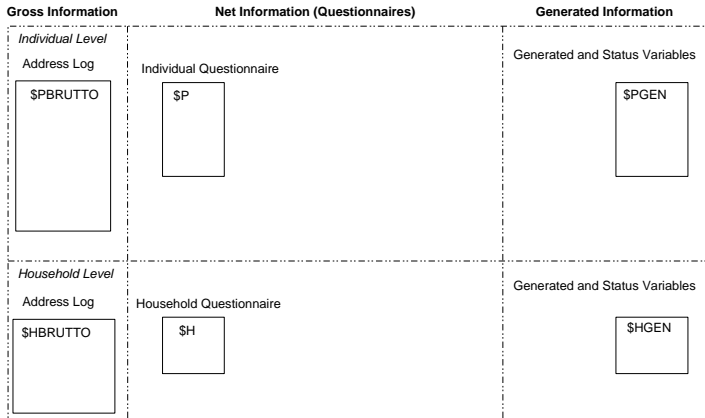
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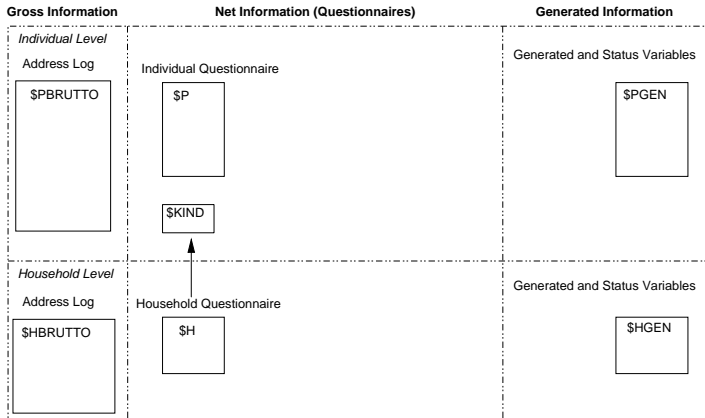
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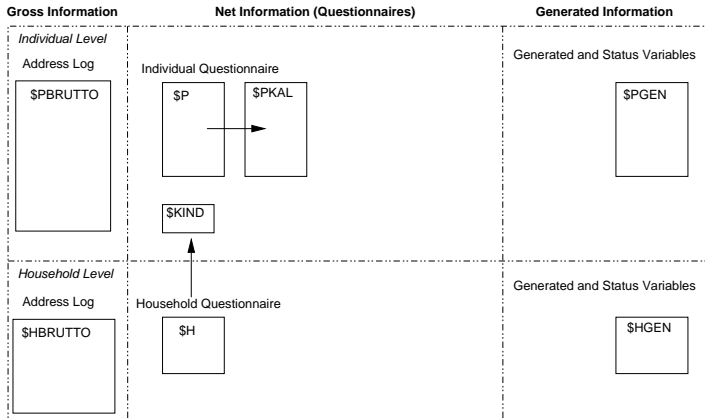
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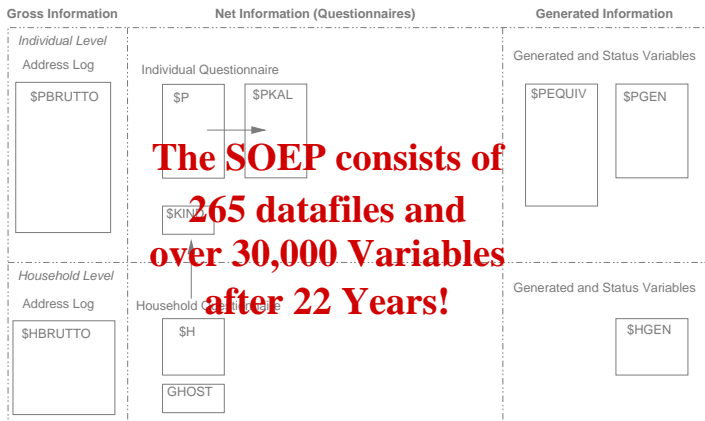
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**The SOEP consists of
265 datafiles and
over 30,000 Variables
after 22 Years!**

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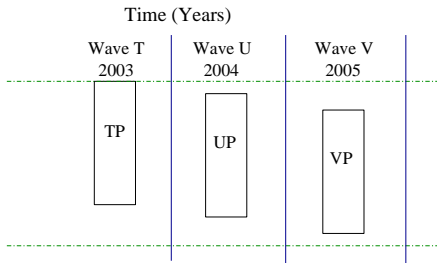
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SOEP: Principle Linkage Structure



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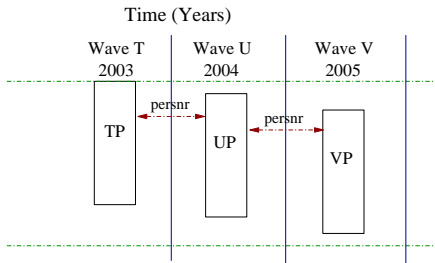
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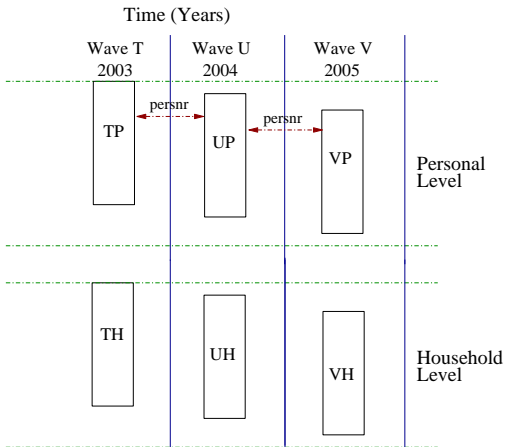
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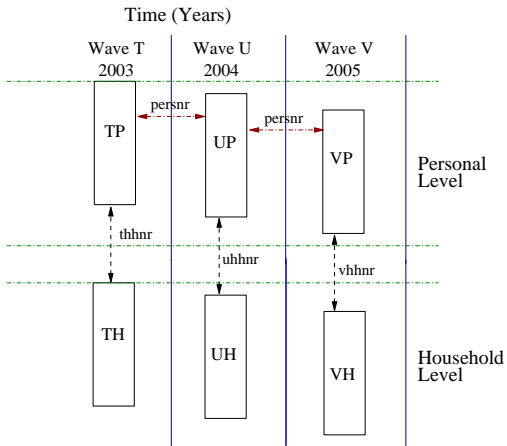
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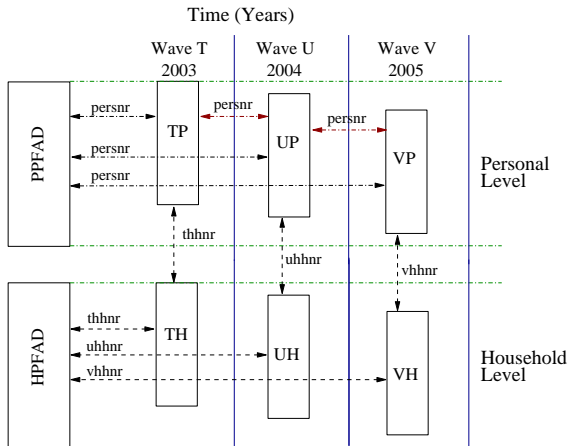
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What this Example is about!

- ▶ Description of the **logical structure** and possibilities to document a complex panel survey, like SOEP
- ▶ We **do not** focus on Physical representation of data and frequencies
- ▶ We skip things like
 - ▶ data format, column position, and width of variables (module *PhysicalDataProduct*), as well as frequencies and descriptive statistics (module *PhysicalInstance*)
 - ▶ Each variable in those modules points by reference to the overall definition of the variable in the module *LogicalProduct*

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The Idea of Grouping and Inheritance

Group <ul style="list-style-type: none">- Concept- Data Collection- Logical Product

- ▶ Hierarchical Model
- ▶ On the top level: definition of Information as a standard
- ▶ On a lower level: capture of variations and additions
- ▶ Inheritance of all characteristics of studies down the hierarchy tree of meta-data!

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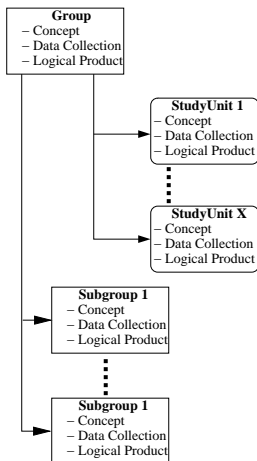
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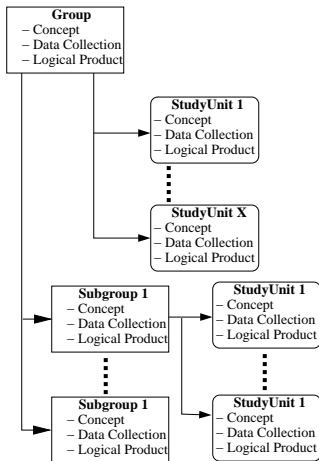
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DDI 3.0 Grouping: The easiest Task

- ▶ A variable like the *PERSNR* (never changing person ID) is consistently defined with constant values over the whole period and for all datasets (currently in 169)
- ▶ Definition only necessary at the top-level (ConceptScheme, LogicalProduct)
- ▶ However most variables do change, at least the variable name (within SOEP)!

What is SOEP?

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DDI 3.0 Grouping: The easy Task

- ▶ Variables like *School Degree* or *Life Satisfaction* are consistently defined with constant values over the whole period, **but with different names over time**
- ▶ Basic Definition at the top-level (ConceptScheme, LogicalProduct, which include VariableScheme, CodeScheme, as well as CategoryScheme)
- ▶ At the lower level (StudyUnit), for each year the the “variable name part” of the variable definition will be added

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DDI 3.0 Grouping: The easy Task

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Group

Person Level
information for all
waves 1997–2003

⇒ Corresponding Variables over Time can be identified by the definition in the VariableScheme in the overall group.

DDI 3.0 and SOEP

Goebel & Wackerow

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DDI 3.0 Grouping: The easy Task

DDI 3.0 and SOEP

Goebel & Wackerow

Definition of:

- Concept
- Variable Definition
- Question Text
- Category Scheme
- Code Scheme

Group

Person Level
information for all
waves 1997–2003

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⇒ Corresponding Variables over Time can be identified by the definition in the VariableScheme in the overall group.

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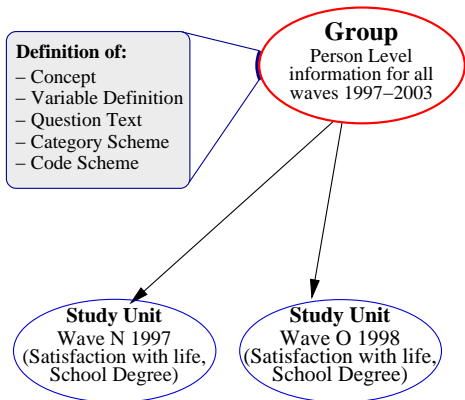
Description
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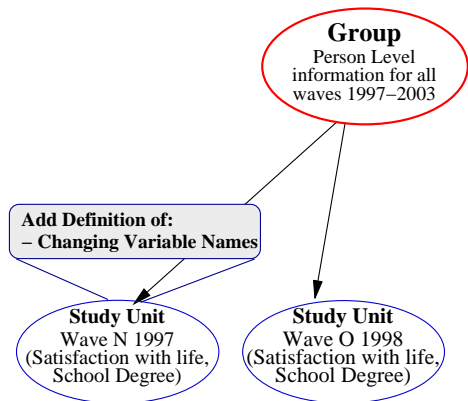
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DDI 3.0 Grouping: The easy Task



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DDI 3.0 Grouping: The easy Task



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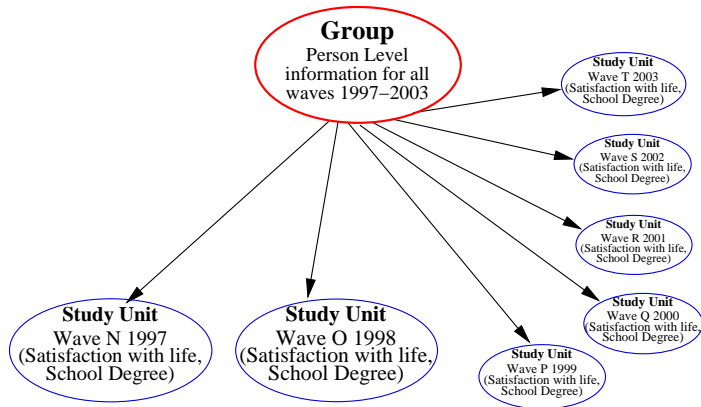
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DDI 3.0 Grouping: The realistic task

- ▶ Questionnaires and/or Variables are changing over time (not only the names)
 - ▶ Improvement of instrument with change in wording, categories ...
 - ▶ Changing real world with new or obsolete variables
 - ▶ Special Topics in only some years
- ▶ Solution: Introduce Subgroups

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DDI 3.0 Grouping: The realistic task

- ▶ Questionnaires and/or Variables are changing over time (not only the names)
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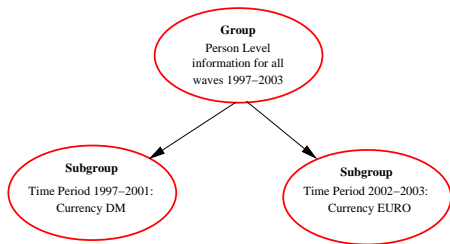
SOEP & DDI 3.0 Grouping Model

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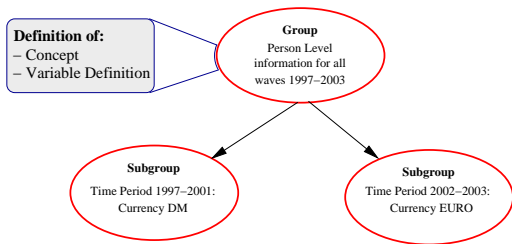
DDI 3.0 Grouping Model: Example I

- ▶ Because of the European Monetary Union (1.1.2002) the currency of income changes from DM to €
- ▶ Insert two Subgroups (before and after)



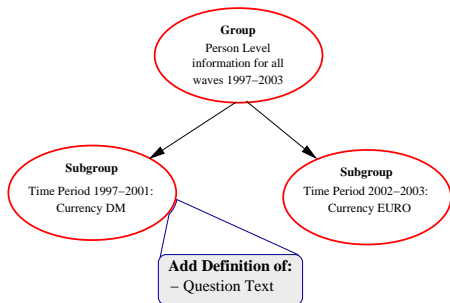
DDI 3.0 Grouping Model: Example I

- ▶ Because of the European Monetary Union (1.1.2002) the currency of income changes from DM to €
- ▶ Insert two Subgroups (before and after)



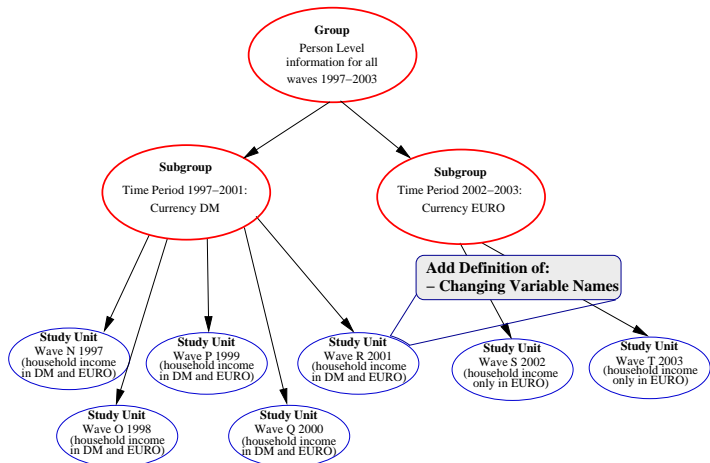
DDI 3.0 Grouping Model: Example I

- ▶ Because of the European Monetary Union (1.1.2002) the currency of income changes from DM to €
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DDI 3.0 Grouping Model: Example 1

- ▶ Because of the European Monetary Union (1.1.2002) the currency of income changes from DM to €
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DDI 3.0 Grouping: Example II

DDI 3.0 and SOEP

Goebel & Wackerow

Company Size Change in surveyed categories

Two different CodeSchemes
(1997–1999 and 1999–2003)

Concerns about the € Only asked around the currency
union (1999–2003)

⇒ Introduction of only two Subgroups
(1997–1998 and 1999–2003)

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DDI 3.0 Grouping: Example II

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Goebel & Wackerow

Company Size Change in surveyed categories Two different CodeSchemes (1997–1999 and 1999–2003)

1997–1998		1999–2003	
Value	Category Label	Value	Category Label
1	LT 5	1	LT 5
2	GE 5 and LT 20	2	GE 5 and LT 20
3	GE 20 and LT 200	3	GE 20 and LT 100
4	GE 200 and LT 2000	4	GE 100 and LT 200
5	GE 2000	5	GE 200 and LT 2000
6	NA, Self-Employed	6	GE 2000
		7	Self-Employed

Concerns about the € Only asked around the currency union (1999-2003)

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1	LT 5	1	LT 5
2	GE 5 and LT 20	2	GE 5 and LT 20
3	GE 20 and LT 200	3	GE 20 and LT 100
4	GE 200 and LT 2000	4	GE 100 and LT 200
5	GE 2000	5	GE 200 and LT 2000
6	NA, Self-Employed	6	GE 2000
		7	Self-Employed

Concerns about the € Only asked around the currency union (1999-2003)

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Company Size Change in surveyed categories
Two different CodeSchemes
(1997–1999 and 1999–2003)

Concerns about the € Only asked around the currency
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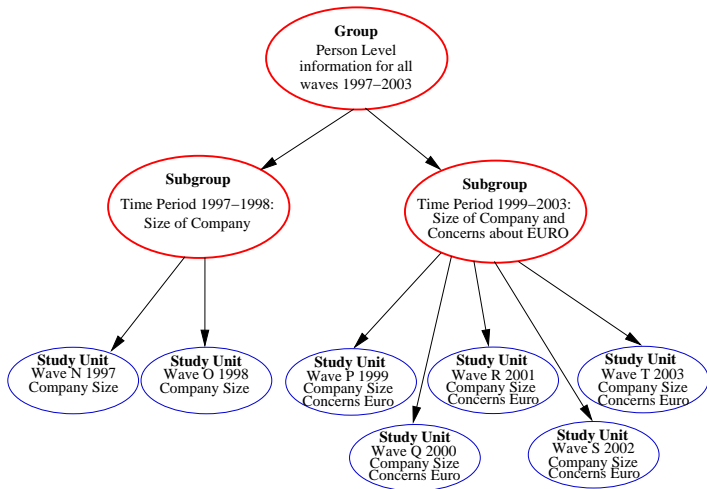
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Two different CodeSchemes
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DDI 3.0 Grouping: Example II



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Connected Data over Time (Wave Relationship)

2001

PERSNR	RP13501 Satisfaction
1	4
2	6
3	2
4	8
5	1
6	10
⋮	⋮
n	x

- ▶ Top Group: Formal panel group
 - ▶ Description of Wave relationship and case identifier
 - ▶ Inheritance down the hierarchical tree to each study unit (wave level)
- ▶ The central case ID (here PERSNR) is described in the section *DataRelationship* of the *LogicalProduct*

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Connected Data over Time (Wave Relationship)

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2001	
PERSNR	RP13501 Satisfaction
1	4
2	6
3	2
4	8
5	1
6	10
⋮	⋮
<i>n</i>	<i>x</i>

2002	
PERSNR	SP13501 Satisfaction
1	3
2	6
3	7
4	5
5	6
7	9
⋮	⋮
<i>n</i>	<i>x</i>

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Connected Data over Time (Wave Relationship)

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2002

PERSNR	SP13501 Satisfaction
1	3
2	6
3	7
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5	6
7	9
⋮	⋮
<i>n</i>	<i>x</i>

2003

PERSNR	TP14201 Satisfaction
1	6
3	4
4	6
5	7
6	10
7	8
⋮	⋮
<i>n</i>	<i>x</i>

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PERSNR	RP13501 Satisfaction
1	4
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5	6
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⋮	⋮
<i>n</i>	<i>x</i>

PERSNR	TP14201 Satisfaction
1	6
3	4
4	6
5	7
6	10
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⋮	⋮
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Connected Data over Time (Wave Relationship)

2001		2002		2003	
PERSNR	RP13501 Satisfaction	PERSNR	SP13501 Satisfaction	PERSNR	TP14201 Satisfaction
1	4	1	3	1	6
2	6	2	6	3	4
3	2	3	7	4	6
4	8	4	5	5	7
5	1	5	6	6	10
6	10	7	9	7	8
⋮	⋮	⋮	⋮	⋮	⋮
<i>n</i>	<i>x</i>	<i>n</i>	<i>x</i>	<i>n</i>	<i>x</i>

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2	6
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5	1
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⋮	⋮
<i>n</i>	<i>x</i>

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1	3
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4	5
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Household-Person Relationship

DDI 3.0 and SOEP

Goebel & Wackerow

2003

THHNR	HINC03 HH-Income
1	800
2	3500
3	5000
⋮	⋮
<i>m</i>	<i>y</i>

2003

PERSNR	THHNR	TP14201 Satisfaction
1	1	6
3	2	4
4	2	6
5	2	7
6	3	10
7	3	8
⋮	⋮	⋮
<i>n</i>	<i>m</i>	<i>x</i>

- ▶ Top Group: Description of Household-Person (hierarchical) relationship
- ▶ Section DataRelationship
- ▶ Changing household ID on wave/study unit level

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2003		2003		
THHNR	HINC03 HH-Income	PERSNR	THHNR	TP14201 Satisfaction
1	800	1	1	6
2	3500	3	2	4
3	5000	4	2	6
⋮	⋮	5	2	7
⋮	⋮	6	3	10
⋮	⋮	7	3	8
⋮	⋮	⋮	⋮	⋮
m	y	n	m	x

- ▶ Top Group: Description of Household-Person (hierarchical) relationship
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2003		2003		
THHNR	HINC03 HH-Income	PERSNR	THHNR	TP14201 Satisfaction
1	800	1	1	6
2	3500	3	2	4
3	5000	4	2	6
⋮	⋮	5	2	7
m	y	6	3	10
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		⋮	⋮	⋮
		n	m	x

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- ▶ Top Group: Description of Household-Person (hierarchical) relationship
- ▶ Section DataRelationship
- ▶ Changing household ID on wave/study unit level

Conclusion

- ▶ **Current possibilities:**
 - ▶ Documentation of changes in meta data over time (Panel Surveys)
 - ▶ Description of connected data over time, as well as between hierarchical data (i.e. Household- and Person-Level)
- ▶ **Limits**
 - ▶ XML Structure getting very complex, need for tools to create and maintain the XML File(s)
 - ▶ Existing documentation must may be reconsidered, adapted or/and supplemented to fit into the new DDI structur, i.e. Concepts.
 - ▶ However, still some open questions:

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 - ▶ Integration in existent workflow?
 - ▶ Technical reorganization? XML-Database?

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The example demonstrates the documentation of constant and changing items over time by using hierarchical groups. Building new variables by derivation is also included.

The example is related to a presentation at the IASSIST conference 2007 in Montreal:
Can Panel Studies Go DDI? First Experiences in documenting the German Socio-Economic Panel Study with DDI 3.0.
<http://www.edrs.mcgill.ca/IASSIST2007/program.htm#E4>

Jan Göbel DIW, jgoebel@diw.de
Joachim Wackerow GESIS-ZUMA, wackerow@zuma-mannheim.de

The example is valid according to the XML Schema of the public review version of DDI 3.0.
It will be adapted to the published version of DDI 3.0 in future.

```
-->
<ddi:DDIInstance1 xsi:schemaLocation1="ddi:instance:0_1 instance.xsd">
  <r:Identification>
    <r:ID>SOEP_DDIInstance</r:ID>1
    <r:IdentifyingAgency>diw.de</r:IdentifyingAgency>1
    <r:Version>1</r:Version>1
  </r:Identification>
  <!-- - - - - - -->
  <g:Group1 time1="T0" instrument1="I0" panel1="P1" geography1="G1" dataSet1="D4" language1="L0">
    <!--
      T0: No specified relationship
      I0: No specified relationship
      P1: Single panel surveyed multiple times
      G1: Single geography surveyed multiple times
      D4: Multiple data files each from a different data collection
      L0: No specified relationship
    -->
    <r:Identification>
      <r:ID>xP_PersonLevel_Group</r:ID>1
    </r:Identification>
    <r:Citation>
      <r:Title>SOEP: Person-level information for all waves 1997 - 2003</r:Title>1
      <r:PublicationDate>
        <r:StartDate>1997</r:StartDate>1
        <r:EndDate>2003</r:EndDate>
      </r:PublicationDate>1
    </r:Citation>
    <g:Purpose>
      <r:Identification>
        <r:ID>xP_PersonLevel_Group_Purpose</r:ID>1
      </r:Identification>
      <r:Content1 xml:lang1="en">Person-level information for all waves 1997 - 2003</r:Content>1
    </g:Purpose>1
    <g:Concepts>1
      <!-- - - - - - -->
      <cn:ConceptualComponent>1
        <r:Identification>
          <r:ID>xP_ConceptualComponent</r:ID>1
        </r:Identification>
        <!-- Description: descriptions on the highest level -->
        <!-- - - - - - -->
        <cn:ConceptScheme>1
          <r:Identification>
            <r:ID>xP_ConceptualScheme</r:ID>1
          </r:Identification>
          <!-- Description: constant definition and constant values over time -->
          <!-- - - - - - -->
          <cn:Concept>1
```

Goebel & Wackerow

What is SOEP?

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The example demonstrates the documentation of constant and changing items over time by using hierarchical groups. Building new variables by derivation is also included.

The example is related to a presentation at the IASSIST conference 2007 in Montreal:
Can Panel Studies
<http://www.edrs.m>

Jan Göbel DIW, jg@diw.de
Joachim Wackerow L

Thank you for your attention!

The example is valid according to the XML Schema. It will be adapted to the published version.

Enjoy the DDI soup!

```
-->
<ddi:DDIInstance xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.ddialliance.org/Specification/DDI3.0/2008-01-01/
  ddi.xsd http://www.ddialliance.org/Specification/DDI3.0/2008-01-01/
  ddi.xsd" >
  <r:Identification>
    <r:ID>SOEP_DDIInstance</r:ID>
    <r:IdentifyingAgency>diw.de</r:IdentifyingAgency>
    <r:Version>1</r:Version>
  </r:Identification>
  <!-- Description: descriptions on the highest level -->
  <g:Group time="T0" instrument="I0" panel="1" geography="G1" language="L0"
    </g:Group>
  </ddi:DDIInstance>
```



(SOEP in Dutch = soup)

T0: No specified relationship
I0: No specified relationship
P1: Single panel surveyed multiple times
G1: Single geography surveyed multiple times
D4: Multiple data files each from a different data collection
L0: No specified relationship

XML-Example:

www.ddialliance.org/DDI/ddi3/SOEP_DDI3.zip

```
</r:Citation>
<g:Purpose>
  <r:Identification>
    <r:ID>X
    <r:IdentifyingAgency>jgoebel@diw.de
  </r:Identification>
  <!-- Description: constant definition and constant values over time -->
  <cn:ConceptScheme>
    <r:Identification>
      <r:ID>XP_ConceptualScheme</r:ID>
    </r:Identification>
  </cn:ConceptScheme>
</g:Purpose>
```

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