Measurement of Daily Experience: Well-being and Aging

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Disclosures: AAS is a Senior Scientist with the Gallup Organization and Senior Consultant with PRO Consulting, Inc.
Overview

- Measurement of daily experience in surveys
- Focus on hedonic measures of Well-being
- Conceptual position on daily assessment
- Methods
  - Immediate Sampling of Affect
  - End-of-Day
  - Yesterday
  - Day Reconstruction Method
- Examples of measurement of daily experience in large-scale surveys
- Summary
Daily Experience

• What domain of content are we talking about?
  – Unlike *evaluative questions*, such as Global measures or Life Satisfaction, we are discussing *immediate experience or feelings*.
  – These are states or information that individuals have direct access to.
  – Examples are:
    • Happy, enjoyment, elation, sad, blue, depressed, angry, irritable
    • Symptoms: pain, fatigue, disease-related
    • Behaviors/Environment: location, setting, activity

• Global and Hedonic W-B as examples for this paper
  – Questionnaire content is different
  – Global is a person characteristic, which may change over time
  – Affect (hedonic) is rapidly changing and is reactive to situations as well as person
    • Therefore, there is potential of understanding environmental determinants of hedonic WB
Work in Experienced Utility
Arthur Stone, 2009-07-13
**Conceptual Position Regarding Measurement**

- Emotions are stored in *Experiential Memory*
  - Stored-lived, fleeting
- Memories of emotions are stored in *Episodic Memory*
- Beliefs are stored in *Semantic Memory*

<table>
<thead>
<tr>
<th>Global Well-being</th>
<th>Hedonic Well-Being</th>
</tr>
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<tbody>
<tr>
<td>Semantic Memory</td>
<td>Experiential Memory</td>
</tr>
</tbody>
</table>

- *As Recall Period* increases, a shift from Experiential/Episodic to Semantic
  - Robinson & Clore’s work on reaction time
Conceptual Position Regarding Measurement

- **Cognitive Heuristics** impact recollection
  - *Rules of Thumb*, but out of awareness
  - *Peak-end*
  - *Current levels*
    - As a proxy for recall period
    - As altering accessibility to past memories
  - *Variability*
  - *Duration neglect*

- These issues are recognized by the survey research world and by regulatory agencies (FDA, EMA)
  - Bradburn’s influential 1987 *Science* article on autobiographical memory in surveys
  - FDA’s “PRO Guidance”
Conceptual Position Regarding Measurement

- **Procedures to avoid bias due to recall**
  - Limit recall period
  - Reconstruction of recall period
  - More precise questions about sought after information
  - Limit queries to information that can be recalled  
  - e.g., salient events may be possible to recall
  - e.g., difficulty with highly fluctuating states

- **Implications for Survey Research**
  - If only short periods are reasonable, how can surveys incorporate such assessments?
  - Ideally, several End-of-Day reports per person
  - What do single, short-term assessments mean?
    - Are they of any value?
    - Are they reasonable for characterizing groups?
    - What Ns are needed in single assessment surveys?
Methodologies for Assessing Daily Experience
Methodologies for Assessing Hedonic W-B Real-time Data Capture

- Capturing *Real-time Experience*
  - Experience Sampling Method (ESM)
    - Csikszentmihalyi
    - Paper-and-pencil
  - Ecological Momentary Assessment (EMA)
    - Context of medical research
    - Generalization of ESM to sampling other modalities
      - EMA assesses phenomena at the moment they occur
      - EMA is dependent upon careful timing of assessments
      - EMA methods usually, but not always, involve a substantial number of repeated observations
      - EMA measurements are made in the environments that subjects typically inhabit
Methodologies for Assessing Hedonic W-B
Real-time Data Capture

- Develop real-time daily sampling scheme
  - Random – with preprogrammed signals
  - Stratified random
  - Event-driven
- Data collection mode
  - Paper-and-pencil
  - Electronic diaries
  - Questions about experience just before signal
- Results
  - Issues with paper-and-pencil
  - Compliance at least 90% with electronic diaries
  - Pharmaceutical industry vendors

Methodologies for Assessing Hedonic W-B End-of-Day Diaries

- **EOD diaries** are the oldest method for capturing near real-time data
- **Require recall for up to 24 hours**
  - Little evidence that major bias due to most heuristics
- **Mode of Administration** (applies to following methods)
  - Paper-and-pencil
    - “Parking Lot” compliance
    - Forward-filling
  - Electronic diary
    - Time-date stamp
  - Interactive Voice Recording (IVR)
    - Few visual cues
  - Internet
    - Household availability of internet access
Methods for Assessing Hedonic Well-being End-of-Day Diaries

- **Assessment Method**
  - Typically mood adjectives from Circumplex
    - E.g., Nowlis Mood Adjective Checklist
    - Positive and Negative Affect Schedule (PANAS)
  - Format #1: Did the adjective:
    - 3= Definitely applied to today’s mood
    - 2= Slightly applied to today’s mood
    - 1= Did not apply to today’s mood
  - Format #2: “To what extent did you experience this affect during the day?”
    - 0=None  2=Slightly  4=Moderately  6=Extremely
Methods for Assessing Hedonic Well-being: Recall of Yesterday

• **Ask person to report affect about yesterday**
  – Advantage: Can be administered anytime during day
  – Advantage: Covers the entire day
  – Disadvantage: Longer recall period

• **Gallup Organization Daily Survey**
  – Since 2 January 2008, 1,000 RDD interviews per day
  – Several questions about *Yesterday*
  – Did you experience the following feelings during A LOT OF THE DAY yesterday? How about _________? NO/YES
  – Enjoyment, Sadness, Stressed, Worried
  – Data presented is of 337,000 interviews conducted in 2008
Methods for Assessing Hedonic Well-being

Day Reconstruction Method (DRM)

• Beyond EOD and Yesterday diaries by incorporating reconstruction of recall period
• Intention was to develop a method that could reproduce ESM/EMA from the perspective of yesterday
• Rationale: Reconstruction of day via time-use

Methods for Assessing Hedonic Well-being
Day Reconstruction Method (DRM)

- Texas; Columbus, OH and Rennes, France
  \( N \approx 800-900; \) samples of women age 18+ initially.
- Respondents were given 3 envelopes, which were opened sequentially. Each envelope contained a questionnaire. The questionnaires were labeled “Packets” 1-3
  - Packet 1 contained standard life satisfaction questions and some demographics.
  - Packet 2 asked respondents to segment the preceding day (a work day) into episodes, like scenes in a movie (mean = 15 episodes); didn’t collect diaries from them at the end.
  - Packet 3 asked detailed questions about the setting of each episode and about their feelings (shown next)
Methods for Assessing Hedonic Well-being
Day Reconstruction Method (DRM)

What were you doing? (check all that apply)

___ commuting
___ shopping
___ doing housework
___ eating
___ socializing
___ nap/resting
___ relaxing
___ intimate relations
___ other (please specify____________________)

___ working
___ preparing food
___ taking care of your children
___ pray/worship/meditate
___ watching TV
___ computer/internet/email
___ on the phone
___ exercising
Methods for Assessing Hedonic Well-being

Day Reconstruction Method (DRM)

How did you feel during this episode?

Please rate each feeling on the scale given. A rating of 0 means that you did not experience that feeling at all. A rating of 6 means that this feeling was a very important part of the experience. Please circle the number between 0 and 6 that best describes how you felt.

<table>
<thead>
<tr>
<th>Feeling</th>
<th>Not at all</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impatient for it to end</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Happy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Frustrated/annoyed</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Depressed/blue</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Hassled/pushed around</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
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<tr>
<td>Angry/hostile</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
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<tr>
<td>Worried/anxious</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
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<tr>
<td>Enjoying myself</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Criticized/put down</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
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<tr>
<td>Tired</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
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</table>
Illustrative Examples of Daily Assessment in Surveys
#1 Recall of Yesterday’s Affect: Gallup Daily Poll

Examples of Approach in Large Surveys

#1 Recall of Yesterday’s Affect: Gallup Daily Poll

![Graph showing stress and worry trends with and without covariates across age groups.]

Examples of Approach in Large Surveys

#1 Recall of Yesterday’s Affect: Gallup Daily Poll

Examples of Approach in Large Surveys

#2 Recall of Yesterday’s Symptoms: By SES

Examples of Approach in Large Surveys

#2 Recall of Yesterday’s Symptoms: By SES

Examples of Approach in Large Surveys

#2 Recall of Yesterday’s Symptoms: By SES

Archives of Internal Medicine, 2010, 170, 570-572.
Examples of Approach in Large Surveys

#3 Reconstruction of Yesterday: Pain by Age

N=3,982; DRM with 3x/day sampling; Kernel regression smoothing
Examples of Approach in Large Surveys

#4 Recall of Yesterday’s Affect: Day of Week

Examples of Approach in Large Surveys

#4 Recall of Yesterday’s Affect: Day of Week

Examples of Approach in Large Surveys

#4 Recall of Yesterday’s Affect: Day of Week

Concluding Thoughts

• My position is that the assessment of daily experience is best approached with relatively brief recall periods

• Real-time, End-of-Day, Yesterday, and Day Reconstruction techniques have been developed

• Early uses of daily experience assessment in cross-sectional surveys has yielded promising information