CONCEPTION AND MEASUREMENT OF ATTITUDES WITHIN THE CAMPBELL PARADIGM
ENVIRONMENTAL ATTITUDE AS THE EXAMPLE

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This [the Campbell paradigm] does not work, however if we treat attitudes as behaviors, we cannot address one of the central questions of attitude research, including environmental attitudes: What is the nature of the relationship, if any, between attitudes and behavior? To equate the two, causes this central question to evaporate… and repudiates decades of research tradition within the study of attitudes
…it is not only important to consider intrapersonal factors such as attitudes, … but also contextual factors such as physical infrastructure, technical facilities, the availability of products and product characteristics.

Linda Steg & Charles Vlek (2009)

**TRUE, BUT HOW? CAMPBELL PARADIGM**
Environmental Attitude: A Most Generic Definition
- extent of esteem for an object: environmental protection

Issues w/in Traditional “Behavior-Explanation Paradigm”
- Catch-22 w/ measurement: defining measure by its indicators
- attitude-behavior gap & increasingly complex behavior explanation

Measurement w/in the Campbell Paradigm
- a person’s attitude a function of self-reports of ecological behavior;
  verbal ecological behavior a function of a person’s attitude
- …not limited to self-reports of ecological behavior

Simple—two Parameter—Account of People’s Behavior
- forecasting performance and impact beyond questionnaires
- nontrivial new findings: basis of cumulative empirical research
Part 1

Conception & Measurement of Environmental Attitude (i.e., Attitude to Protect the Environment)
An inferred property… [that] is equated with the probability of recurrence of behavior forms of a given type or direction.

\[
\ln \left( \frac{p_{ni}}{1 - p_{ni}} \right) = \theta_n - \delta_i
\]

- \(p_{ni}\): probability of person \(n\) to engage in behavior \(i\)
- \(\theta_n\): person \(n\)’s “attitude” level
- \(\delta_i\): behavioral costs of behavior \(i\) (its difficulty)

**THE CAMPBELL PARADIGM**

<table>
<thead>
<tr>
<th>Environmental Attitude ((\theta_n))</th>
<th>Behavioral Costs ((\delta_i))</th>
</tr>
</thead>
<tbody>
<tr>
<td>install solar panels</td>
<td>(0.05)</td>
</tr>
<tr>
<td>donate to env. organizations</td>
<td>(0.16)</td>
</tr>
<tr>
<td>commute by bike</td>
<td>(0.39)</td>
</tr>
<tr>
<td>downtown w/o car</td>
<td>(0.47)</td>
</tr>
<tr>
<td>no convenience foods</td>
<td>(0.75)</td>
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<tr>
<td>taking a shower (not bath)</td>
<td>(0.87)</td>
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<td>recycle paper</td>
<td>(0.93)</td>
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References:
- PSPR (2010)
- JSP (2015)
ATTITUDE TO PROTECT THE ENVIRONMENT
PROPENSITY TO ACT PRO-ENVIRONMENTALLY

An INFERRED PROPERTY… [that] is EQUATED with the probability of recurrence of behavior forms of a given type or direction

MELVIN L. DEFLEUR & FRANK R. WESTIE (1963)

\[
\ln\left(\frac{p_{ni}}{1 - p_{ni}}\right) = \theta_n - \delta_i
\]

\(p_{ni} \): probability of person n to engage in BEHAVIOR \(i\)

\(\theta_n \): person n’s “attitude” level

\(\delta_i \): behavioral costs of behavior \(i\) (its difficulty)

PSPR (2010)
JSP (2015)

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<th>Behavior</th>
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CONSTRUCT VALIDITY W/IN THE BEHAVIOR-EXPLANATION PARADIGM

**PROPENSITY TO ACT PRO-ENVIRONMENTALLY**

<table>
<thead>
<tr>
<th>Strongly Agree</th>
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<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
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<tbody>
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<td></td>
<td></td>
</tr>
<tr>
<td>b) Most people who are important to me think that should reuse my shopping bags</td>
<td>SUBJECTIVE NORMS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Buying milk in returnable bottles is easy/simple</td>
<td>PERCEIVED CONTROL</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>d) In the future, I intend to refrain from owning a car</td>
<td>INTENTION</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>e) I refrain from prewashing my laundry</td>
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**ATTITUDE**

- Behavioral attitude
- Subjective norms
- Perceived behavioral control

**SUBJECTIVE NORMS**

- Behavioral attitude
- Subjective norms
- Perceived behavioral control

**PERCEIVED CONTROL**

- Behavioral attitude
- Subjective norms
- Perceived behavioral control

**INTENTION**

- Behavioral attitude
- Subjective norms
- Perceived behavioral control

**BEHAVIOR**

- Behavioral attitude
- Subjective norms
- Perceived behavioral control

**N = 468**

- age: 23.2
- females: 83.1%

**N = 787**

- age: 46.2
- females: 57.6%

CONVERGENT VALIDITY W/ OTHER MEASURES OF ENVIRONMENTAL ATTITUDE

- Ultimate survival depends on humankind living in harmony with nature
- Smoking chimneys upset me because they imply pollution

**JEP (2007)**

- $N = 865$
- age: 13.3
- females: 39.7%

**European Psychologist (2011)**

- $N = 1,309$
- age: 28.0
- females: 45.2%

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$E_{\text{ENVIRONMENTAL ATTITUDE}}$

(Preservation scale; Franz Bogner et al.)

- $r_{\text{corr.}} = .72; R^2 = 51.8\%$

$E_{\text{ENVIRONMENTAL ATTITUDE}}$

(self-reports of behavior: GEB scale)

- $r_{\text{corr.}} = .49; R^2 = 24.0\%$
**ENVIRONMENTAL ATTITUDE**

**INCREMENTAL VALIDITY**

SELF-REPORTED VEGETARIANISM

*linear trend:*

\[ F(1,218) = 8.8; \ p = .003; \ \eta^2 = 5.0\% \]

**OBJECTIVE PRO-ENVIRONMENTAL BEHAVIOR:**
BASE RATE VEGETARIANS 4-7%

nonvegetarians vs. vegetarians:
\[ F(1,220) = 0.9; \ p = .77 \]

\[ N = 222 \]
\[ \text{age: 39.3; } \]
\[ \text{females: 89.3\%} \]

The JSP (2015)
**Environmental Attitude**

**Discriminant Validity & Stability**

**Environmental Protection vs. Nature**

- **2008**: $M = 0.55$, $SD = 0.89$, $p < .001$
- **2010**: $M = 0.55$, $SD = 0.88$

- **CFI** = .96
- **SRMR** = .05
- **RMSEA** = .06

**European Psychologist (2013)**

- $N = 1,336$; age: 36.6; females: 44.8%

**ERAP (2014)**

- $N = 251$; age: 35.6; females: 51%
$N = 254$

age: 37.1

females: 43.7%

$t (252) = -2.39; p = .018; \eta^2 = 14.9\%$

PREDICTIVE VALIDITY

OVERT BEHAVIOR

ICEK AJZEN & MARTIN FISHBEIN (2005)
the sound measurement of attitude requires knowledge about the right behavioral indicators of said attitude, and vice versa; recognizing the right behavioral indicators necessitates the valid measurement of the attitude

**JAN DE HOUWER, BERTRAM Gawronski, & DERMOt BARNES-HOLMES (2013)**

### ATTITUDE MEASURE: TYPICAL INDICATORS

<table>
<thead>
<tr>
<th></th>
<th>Riding a bicycle or taking public transportation to work or school is...</th>
<th>Good</th>
<th></th>
<th></th>
<th>Bad</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Reusing my shopping bags is...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Refraining from using a clothes dryer is...</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>Talking with friends about problems related to the environment is...</td>
<td></td>
<td></td>
<td></td>
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### BEHAVIOR MEASURE: TYPICAL INDICATORS

<table>
<thead>
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<th></th>
<th>I reuse my shopping bags.</th>
<th>Yes</th>
<th>No</th>
<th></th>
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<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>In the winter, I keep the heat on so that I do not have to wear a sweater.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I use fabric softener with my laundry.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I put dead batteries in the garbage.</td>
<td></td>
<td></td>
<td></td>
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AN EXAMPLE FOR MEASURES DEFINED BY INDICATORS: WITHIN THEORY OF PLANNED BEHAVIOR

\[ N = 468 \]
\[ \text{age: 23.2} \]
\[ \text{females: 83.1\%} \]

\[ N = 787 \]
\[ \text{age: 46.2} \]
\[ \text{females: 57.6\%} \]

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**Environmental Attitude Scales**

Based on Behavioral Self-Reports & Evaluative Statements

\[ r = 0.74 \]

\[ N = 787 \]

age: 46.2
females: 57.6%

---

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>EA-50</th>
<th>EA-48</th>
<th>EA-98</th>
<th>EA-49A</th>
<th>EA-49B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-report items (EA-50)</td>
<td>787</td>
<td>-0.09</td>
<td>0.81</td>
<td>0.74</td>
<td>0.83</td>
<td>1.00a</td>
<td>1.00a</td>
<td>1.00a</td>
</tr>
<tr>
<td>Evaluative statements (EA-48)</td>
<td>783</td>
<td>0.39</td>
<td>0.89</td>
<td>0.65</td>
<td>0.83</td>
<td>1.00a</td>
<td>1.00a</td>
<td>1.00a</td>
</tr>
<tr>
<td>Combined (EA-98)</td>
<td>787</td>
<td>0.14</td>
<td>0.77</td>
<td>0.87</td>
<td>0.94</td>
<td>0.88</td>
<td>1.00a</td>
<td>1.00a</td>
</tr>
<tr>
<td>Version A (EA-49A)</td>
<td>787</td>
<td>0.12</td>
<td>0.79</td>
<td>0.82</td>
<td>0.85</td>
<td>0.93</td>
<td>0.76</td>
<td>0.94</td>
</tr>
<tr>
<td>Version B (EA-49B)</td>
<td>787</td>
<td>0.16</td>
<td>0.87</td>
<td>0.80</td>
<td>0.89</td>
<td>0.94</td>
<td>0.74</td>
<td>0.81</td>
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*Kaiser & Merten (2015)*
Part 2

A Simple
—rather than a Complex—
Account of Human Behavior
Mind the Gap: why do people act environmentally and what are the barriers to pro-environmental behavior?

…the question what shapes pro-environmental behavior is such a complex one that it cannot be visualized in one single framework or diagram.


Human behavior and motivation are enormously complex…

Joe E. Heimlich & Nicole M. Ardoin (2008)
EXPANDING COMPLEXITY OF BEHAVIOR EXPLANATION:
MORE DETERMINANTS AND MORE RELATIONS

STILL A GAP: (i.e., the “situation” [i.e., behavioral costs] rather than the “person” [i.e., attitudes]) tends to play a larger role than individual differences...

HEATHER BARNES TRUELOVE ET AL. (2014)

22 studies
29 independent samples
175 < N < 8516

-meta-theoretical synthesis

SEBASTIAN BAMBERG & GUIDO MÖSER (2007)
If preferences [i.e., attitudes] … are strong, we would expect defaults [i.e., behavioral costs] to have little or no effect…

\[ \ln\left( \frac{p_{n_i}}{1 - p_{n_i}} \right) = \theta_n - \delta_i \]

**PRO-ENVIRONMENTAL BEHAVIOR ACCOUNTED BY**

2 COMPENSATORY CONDITIONAL EFFECTS—1ST EXAMPLE

\[ F(2,592) = 45.8; \ p < .001; \ \eta^2 = 13\% \text{ (attitude)} \]
\[ F(1,592) = 46.7; \ p < .001; \ \eta^2 = 7\% \text{ (behavioral costs)} \]
\[ F(2,592) = 2.5; \ p = .08; \ \eta^2 = 0.8\% \]

\( n = 286 \)
\( n = 312 \)

Byrka, Kaiser & Olko (in prep.)
PRO-ENVIRONMENTAL BEHAVIOR ACCOUNTED BY

\[ \ln \left( \frac{p_{ni}}{1 - p_{ni}} \right) = \theta_n - \delta_i \]

2 COMPENSATORY CONDITIONAL EFFECTS—2nd example

\[ N = 231 \]
\[ \text{age: 35} \]
\[ \text{females: 61\%} \]

PROTECTION PERFORMANCE
(PROPORTION OF BIO-PRODUCTS)

ENVIRONMENTAL ATTITUDE

DEFAULTS (BEHAVIORAL COSTS)
- “green” (effort: low)
- conventional (effort: high)

\[ F(1,227) = 45.5; p < .001; \eta^2 = 17\% \text{ (attitude)} \]
\[ F(1,227) = 56.7; p < .001; \eta^2 = 20\% \text{ (behavioral costs)} \]
\[ F(1,227) = 0.5; p = .49; \eta^2 = 0.2\% \]

Vetter & Arnold (2015)
PRO-ENVIRONMENTAL BEHAVIOR ACCOUNTED BY 2 COMPENSATORY CONDITIONAL EFFECTS—3RD EXAMPLE

\[
\ln \left( \frac{p_{ni}}{1 - p_{ni}} \right) = \theta_n - \delta_i
\]

- F(1,127) = 4.9; \( p < .05; \eta^2 = 3.7\% \) (attitude)
- F(1,127) = 10.8; \( p < .005; \eta^2 = 7.8\% \) (behavioral costs)
- F(1,127) = 0.2; \( p = .66; \eta^2 = 0.2\% \)

N = 131
age: 54.9
females: 39.7%

The JSP (2015)
IJP (2011)
What explains people’s pro-environmental engagement?

\[
\ln \left( \frac{p_{ni}}{1 - p_{ni}} \right) = \theta_n - \delta_i
\]

Complex or Simple?
Why is that Important?
Part 3

Nontrivial Novel Findings
ENVIRONMENTAL ATTITUDE & ECOLOGICAL IMPACT
CONTROLLING FOR INCOME

$N = 893$
age: 56.3
females: 33.3%

$r = -0.18$

SAVING POTENTIAL:
$\Delta > -1200 \Delta kWh$
$> -33.3$

FOOT-IN-THE-DOOR EFFECT

\[ N = 229 \]
\[ \text{age: 27.4} \]
\[ \text{females: 52.8\%} \]

**linear trend:**
\[ F(1,110) = 21.1; \ p < .001; \]
\[ \eta^2 = 16\% \]

\[ t(81.95) = 11.92, \ p < .001, \eta^2 = 45\% \]
Malleability of Environmental Attitude

2001: $N = 779$; females: 57.9%; age: 46.2
2010: $N = 2317$; females: 52.6%; age: 52.1

JEP (2014)
WHAT DID WE LEARN?

• Campbell Paradigm — a Proposition on…
  ➢ how to measure people’s attitudes
  ➢ how to relate intrapersonal & contextual factors of behavior

• Measurement of Attitude w/in the Campbell Paradigm
  ➢ w/ behavioral self-reports: “propensity to act pro-environmentally”
  ➢ w/ evaluative statements traditionally used for attitude,…
  …social norms, perceived control, & intention as long as…
  …item difficulties part of the measurement model: Rasch model

• Forecast of Behavior w/in the Campbell Paradigm
  ➢ individual attitudes and behavioral costs, both separately effective
  ➢ compensatory efficacy w/in a probabilistic account of behavior
  ➢ a simple understanding: crucial for effectively changing behavior
  …to render the art of applied psychology into a science
Katarzyna Byrka
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Nina Roczen
Antal Haans
Jacqueline Frick
Hannah Scheuthle
Nina Roczen
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Franz Bogner
Gundula Hübner
Carmen Tanner
Urs Fuhrer
Einar Strumse
Michael Ranney
and several others
It is in vain to do with more what can be done with fewer

William of Occam (ca. 1287—ca. 1347)

Questions?

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