How Technical Professions can benefit from Insights from Psychology

Claus-Christian Carbon

University of Bamberg
Department of General Psychology and Methodology
Research Group EPÆG
(Ergonomics, Psychological Æsthetics, Gestalt)
Bamberg, Germany

forschungsgruppe EPÆG | Ergonomie Psychologische Ästhetik Gestaltung

ccc@experimental-psychology.com

Overview

- About the relevance of (cognitive) psychology
- Fundamental problems for technology-driven fields when ignoring psychology
- Conclusions

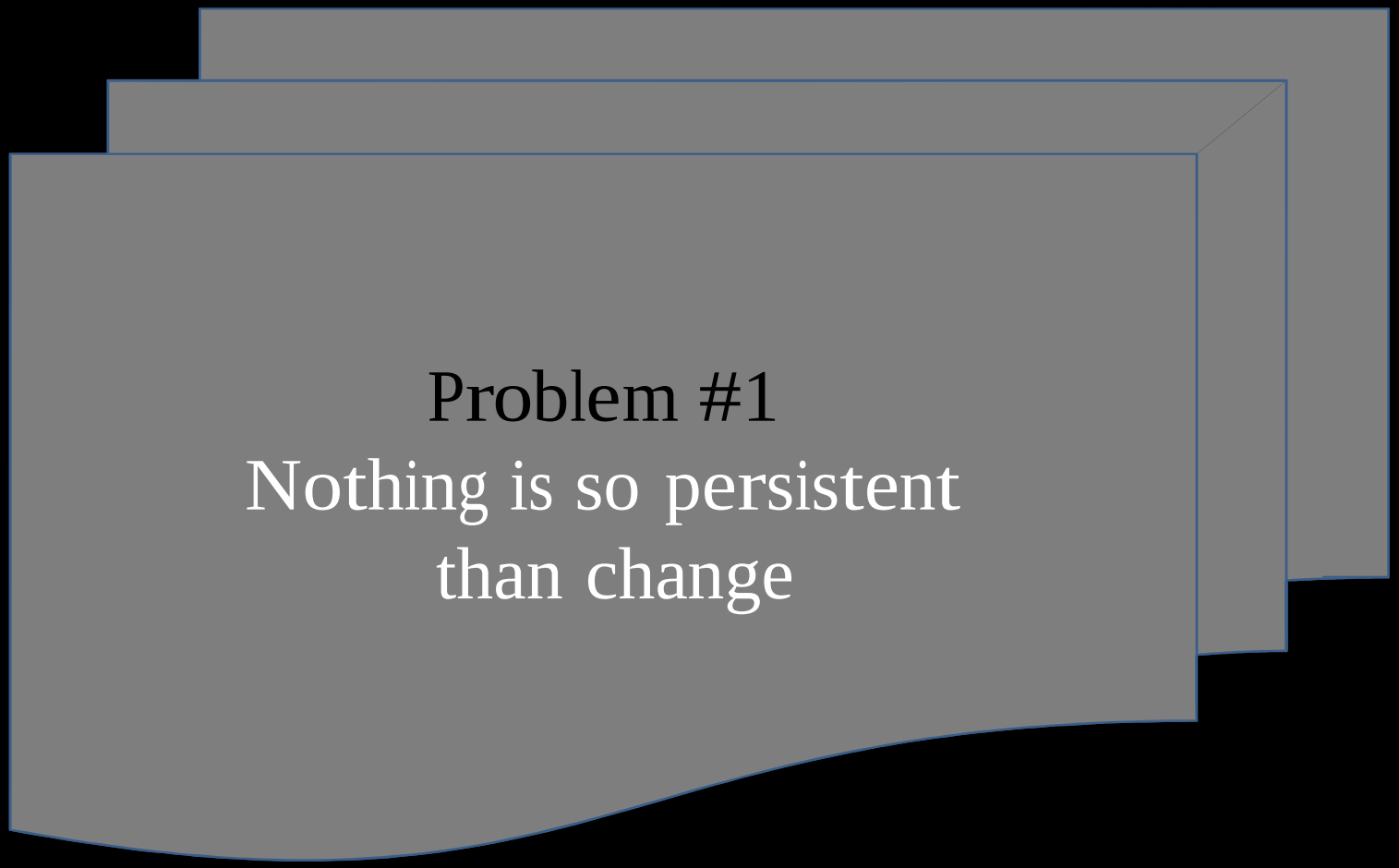
A word about psychology beforehand

Psychology means cognitive psychology here. It comprises perception, cognition (plus affective processing) and action

21st century will be the century of psychology because all kinds of topics are always encountering one essential entity in the end: the human!

The fundamental problem

- The gap between the sciences
  (especially technology and social sciences)
  - Terminology (different / incompatible)
  - Education (physics vs. psychology)
  - Aims (developing techniques vs. serving humans)
  - Level of Transferability (theory vs. practice)
  - Lack of knowledge (prejudices / no idea)


Problem #1
Nothing is so persistent
than change

Standards change…

ust consider dynamics
it's not always
g in one direction only…)

E65-2001

W221-2005

Camaro-2009

Elantra-2015

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Carbon (2017)

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ling

Motorola Dyn
8000X

1983

Motorola
A830

2003

Speed

99

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Pres ige/

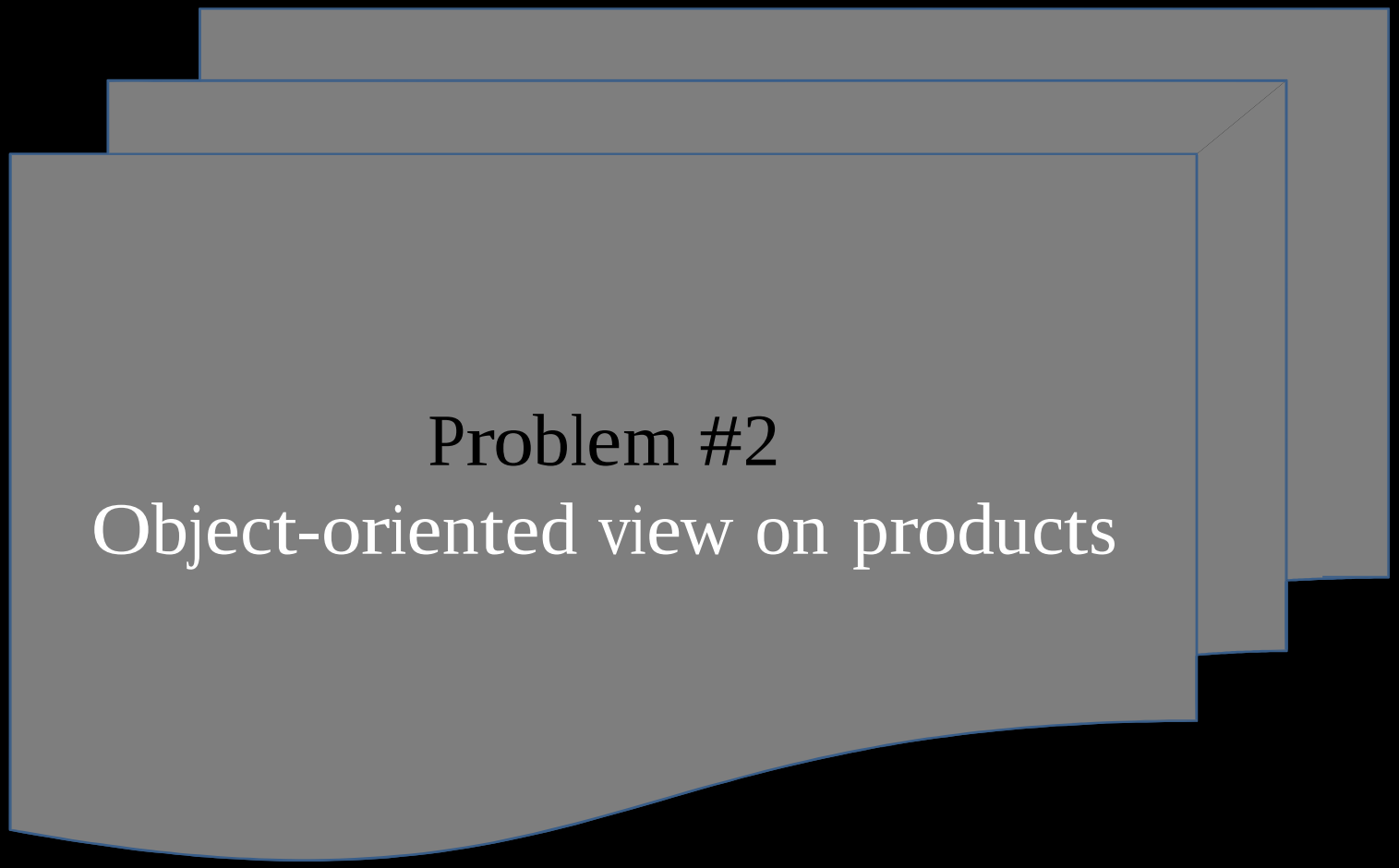
Re ability

Importance

Efficiency

Self-presentation

Experience…


Problem #2
Object-oriented view on products

Object-view

Is the OBJECT (e.g. the consumer product, the designed product, the fashion item) the right target to investigate?

Object-view

Problem #2:
Object-oriented approach

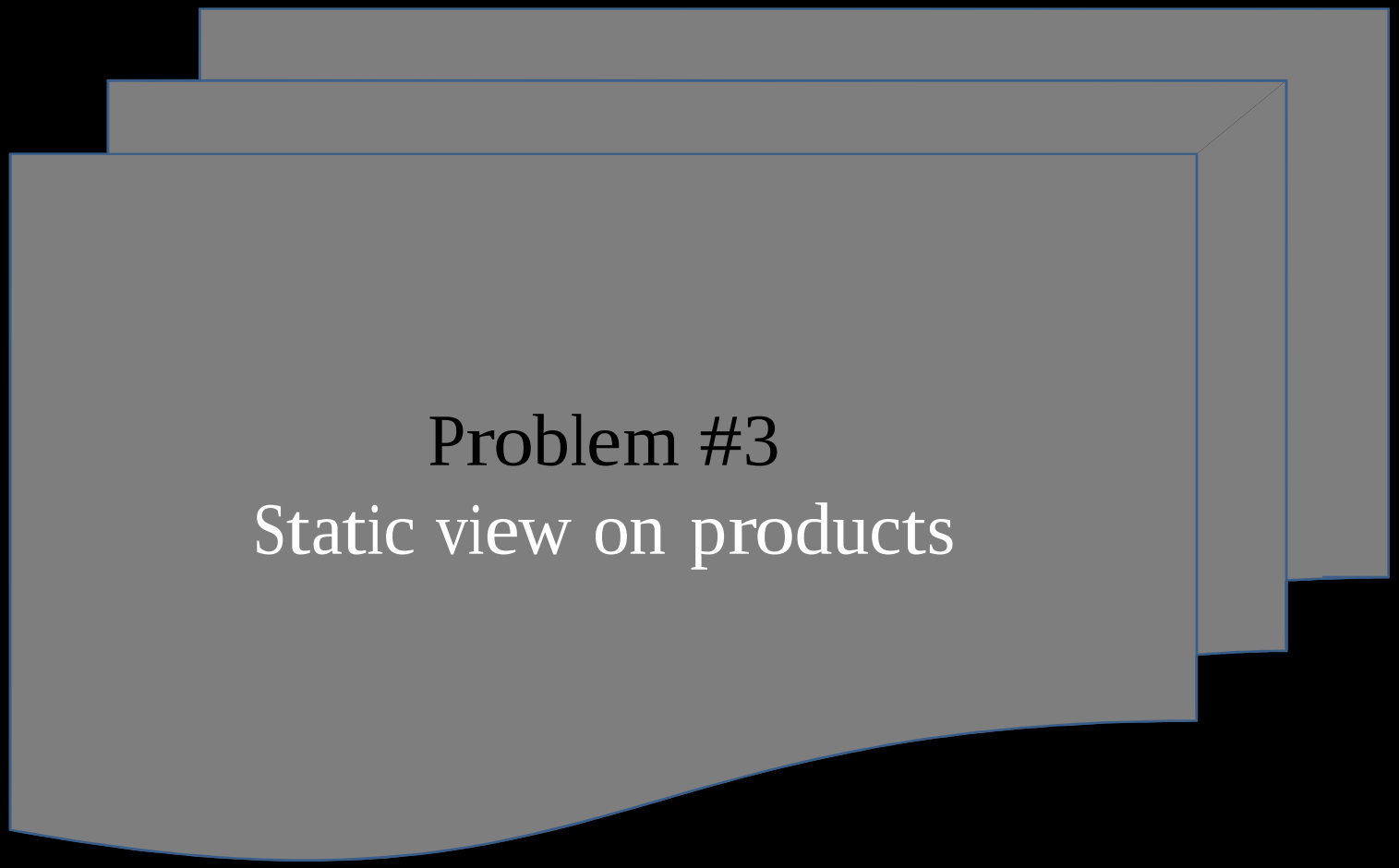
#TheDress-Aesthetics
(Carbon & Hesslinger, draft)

Aesthetics of #TheDress

Better ed

L liked

If whitish-goldish impression increased: even more liked!

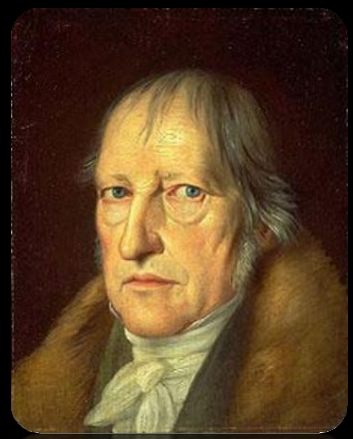

Problem #3
Static view on products

Zeitgeist

Problem #3:
Static perspective

First indication of strong Zeitgeist effects:
Art historical epochs, Design evolutions, Fashion


System
der
Wissenschaft
von
Ge. Wilh. Fr. Hegel
D. u. Professor der Philosophie zu Jena,
der Herzogl. Mineralog. Societät daselbst Assessor
und andrer gelehrten Gesellschaften Mitglied.
Erster Theil,
die
Phänomenologie des Geistes.
Bamberg und Würzburg,
bey Joseph Anton Goebhardt,
1807.



Georg W. F. Hegel
(1770 –1831)

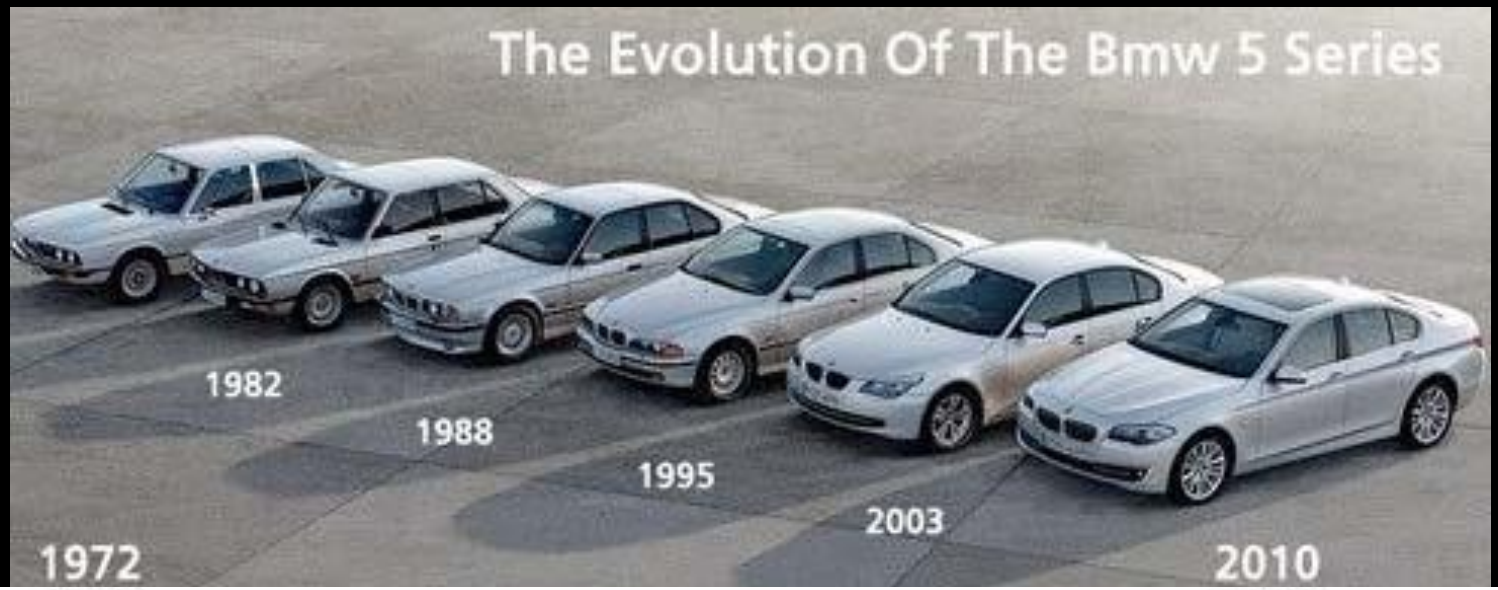
"no man can surpass his own time, for the spirit of his time is also his own spirit."

(Hegel, 1837: Lectures on the Philosophy of History)

Zeitgeist

Problem #3:
Static perspective

Design: Evolution



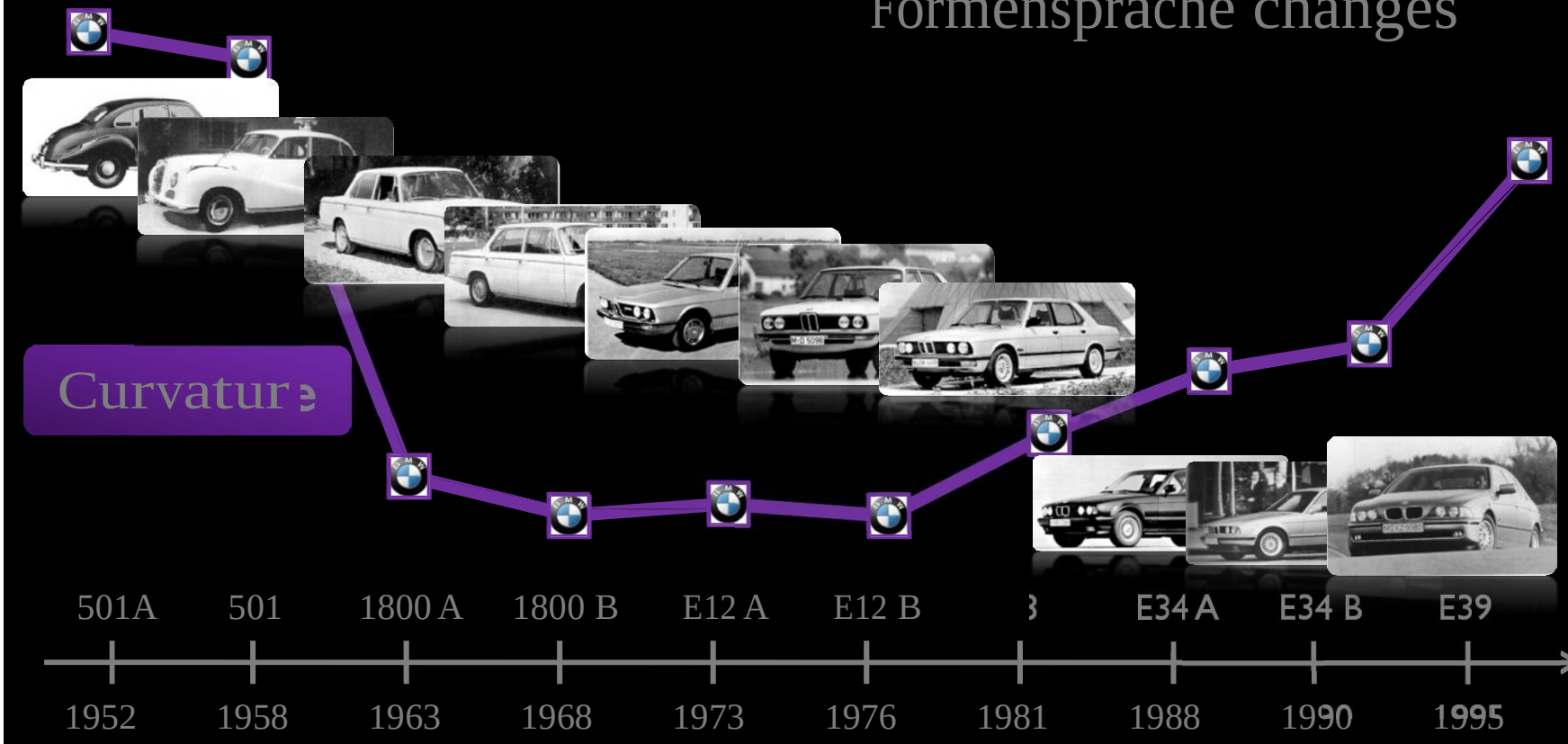
LADA. Perfect From The Beginning

Zeitgeist

Problem #3:
Static perspective

Design evolutions: Car shapes in Germany

Macro-level:
Formensprache changes

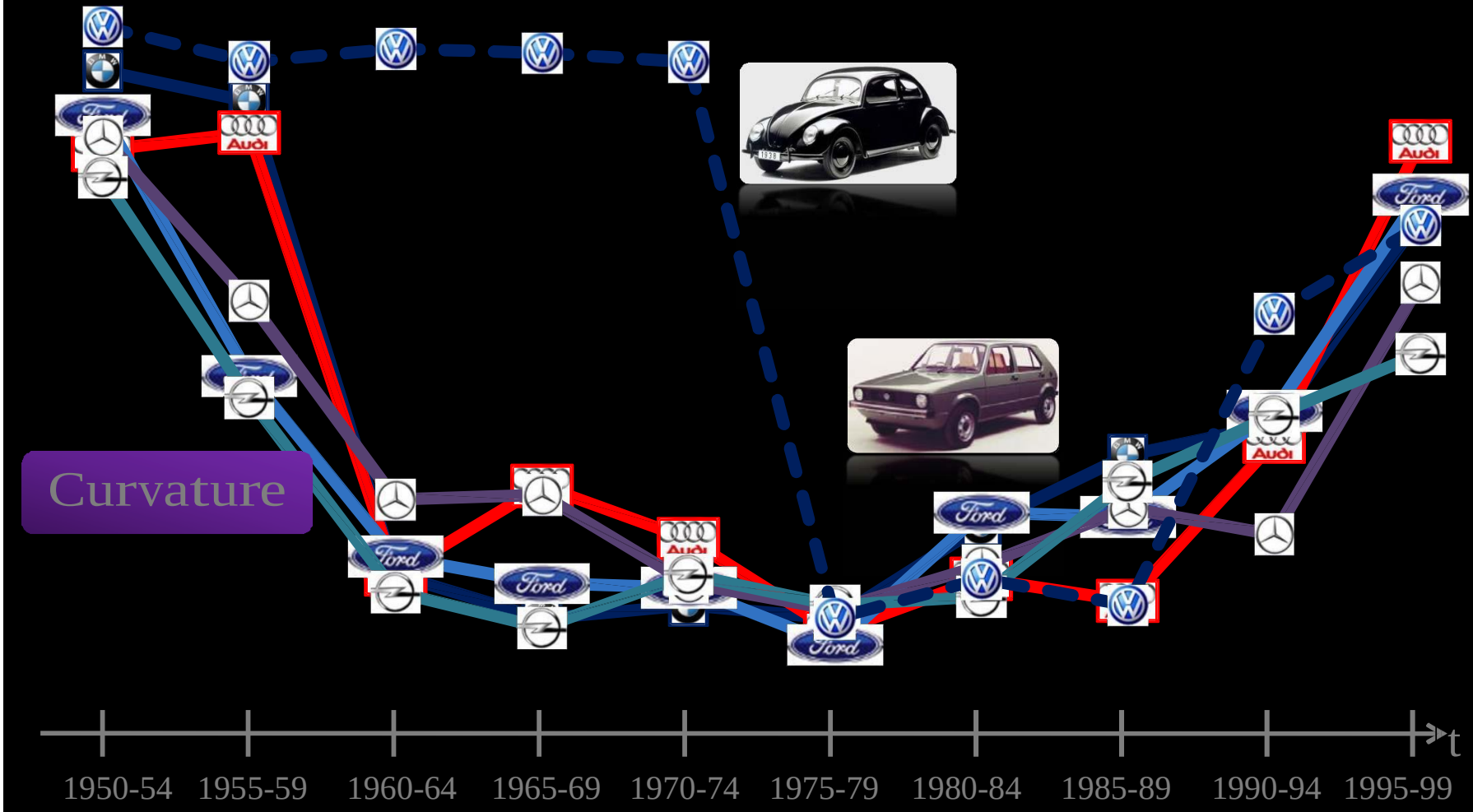


Carbon (Acta Psych, 2010)

Zeitgeist

Problem #3:
Static perspective

Design evolutions: Car shapes in Germany

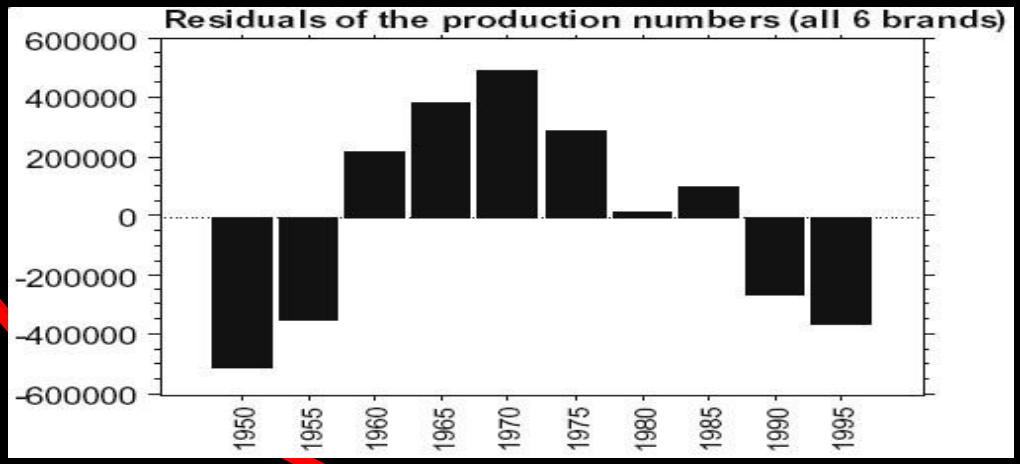


Carbon (Acta Psych, 2010)

Zeitgeist

Problem #3:
Static perspective

Design evolutions: Car shapes in Germany



Liking

C rvature

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1950-54 1955-59 1960-64 1965-69 1970-74 1975-79 1980-84 1985-89 1990-94 1995-99

Carbon (Acta Psych, 2010)

Zeitgeist

The mechanism behind: Adaptation

Adaptation to highly innovative car designs ("Simulation of future visual habits")

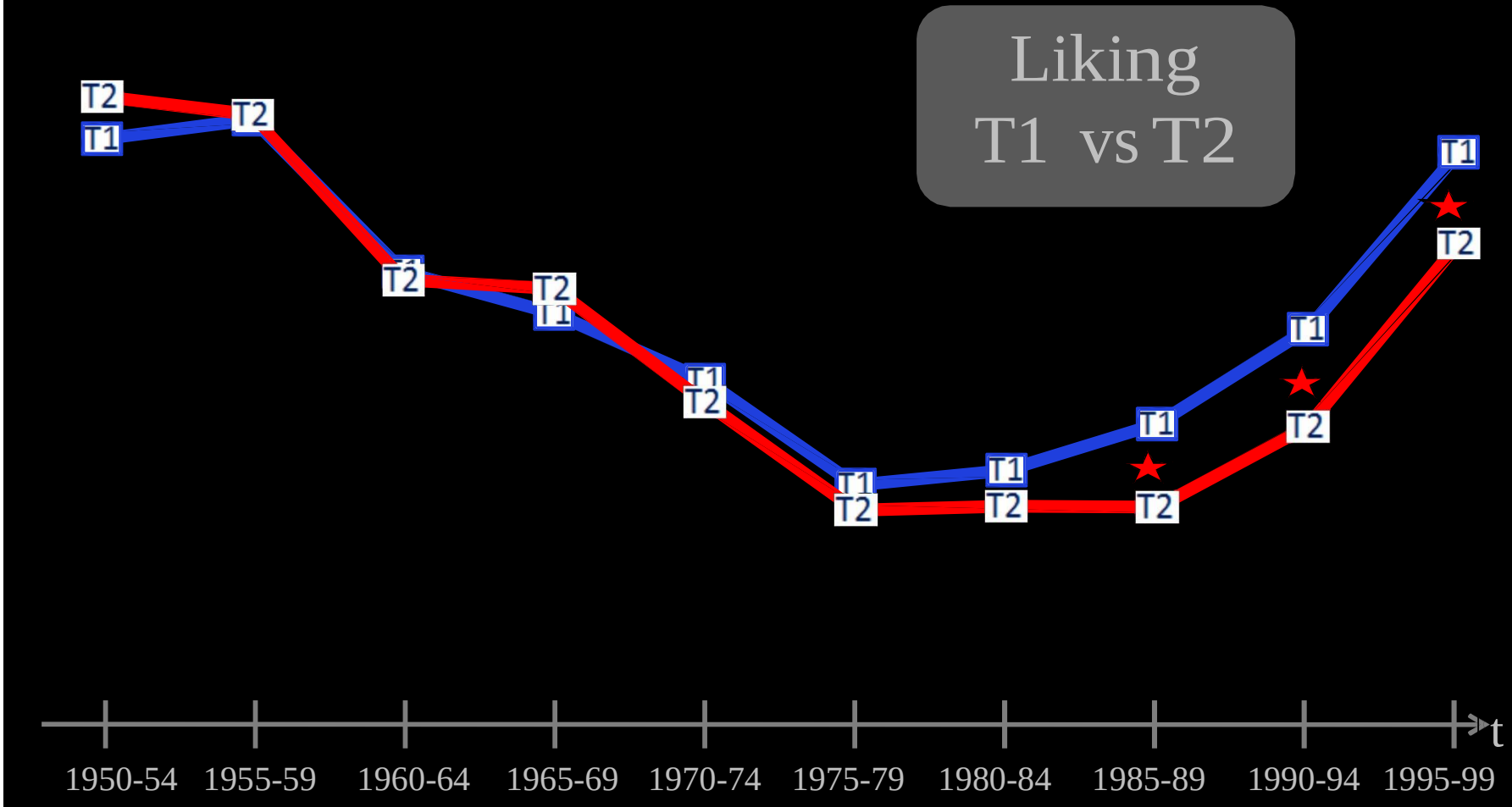
Micro-level:
e.g. Liking changes

Carbon (Acta Psych, 2010)

Zeitgeist

Problem #3:
Static perspective

The mechanism behind: Adaptation



Carbon (Acta Psych, 2010)

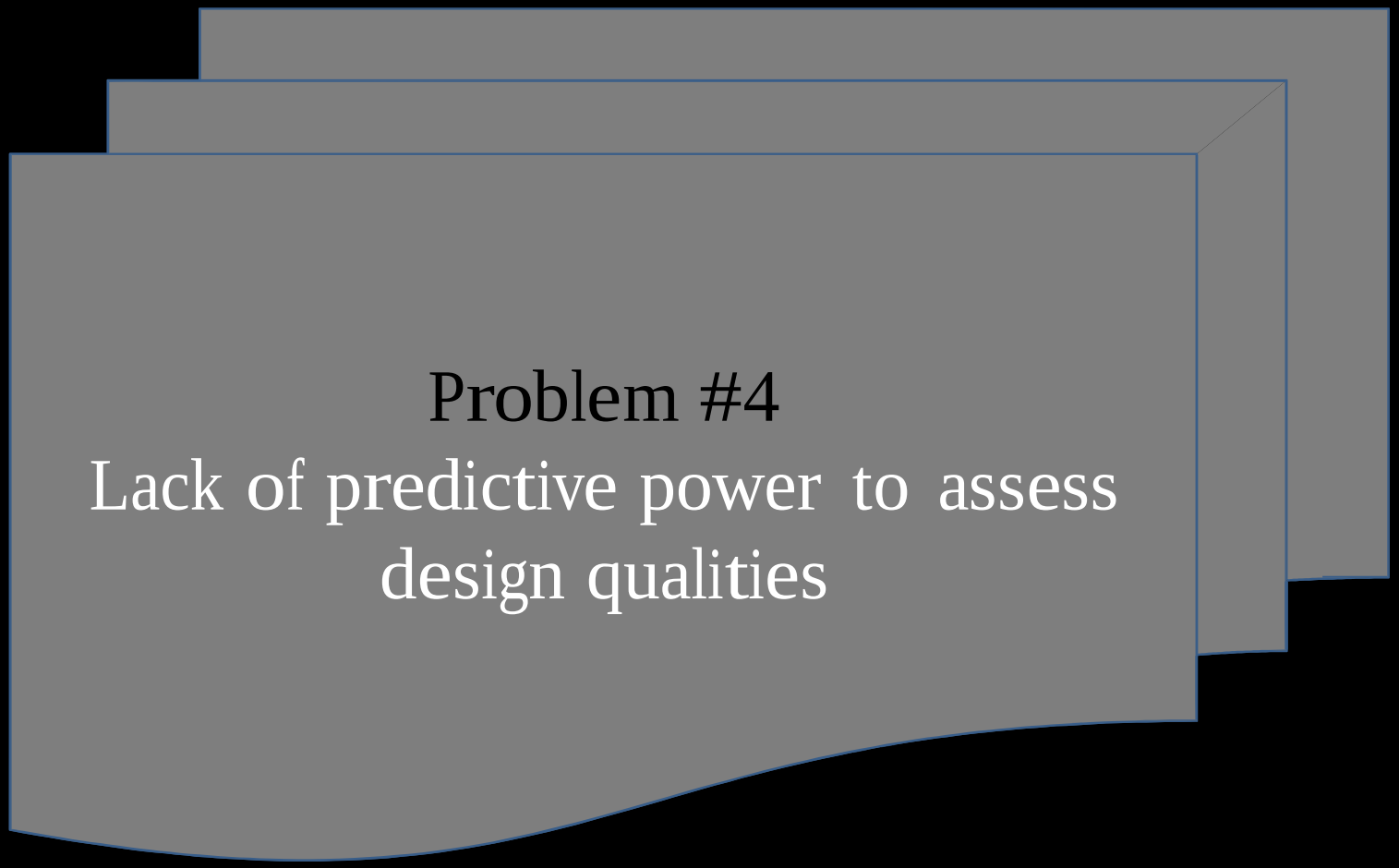
Zeitgeist

The mechanism behind: Adaptation

Adaptation seems an essential mechanism to explain the change of preferences

(detachment from familiar objects
PLUS
Increase of liking for novel objects)

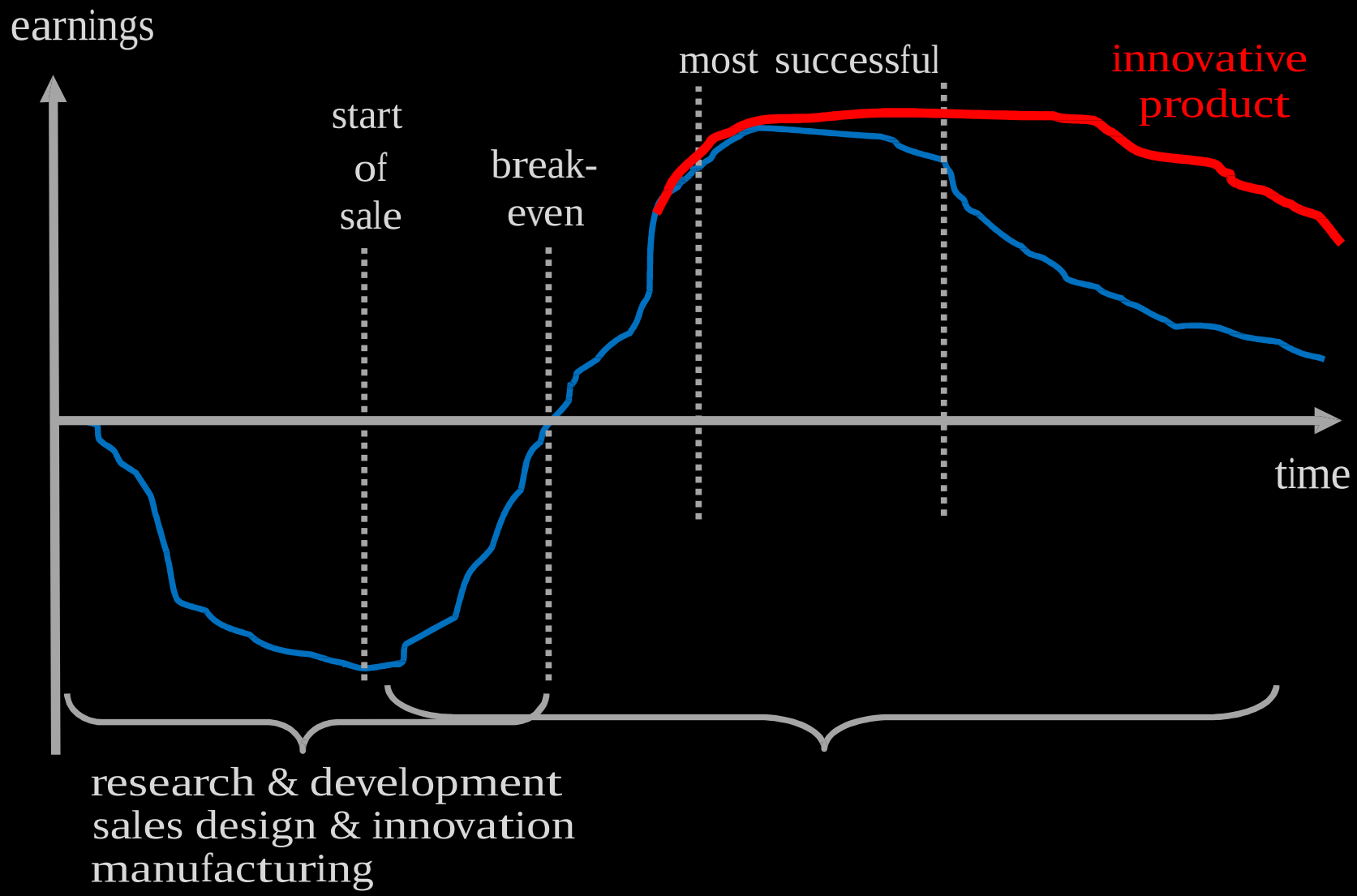
Carbon (Acta Psych, 2010)


Problem #4
Lack of predictive power to assess design qualities

Psychology of design

…often ends where future starts

The need for prediction



Psychology of design

To predict the acceptance of consumer products, we need to assess a (relatively) stabilized level of representation

Deepelaboration of the later to be evaluated material is mainly important for assessing the psychological quality of products that are …

- highly innovative
- very distinctive
- uncommon
- untypical

- unfamiliar

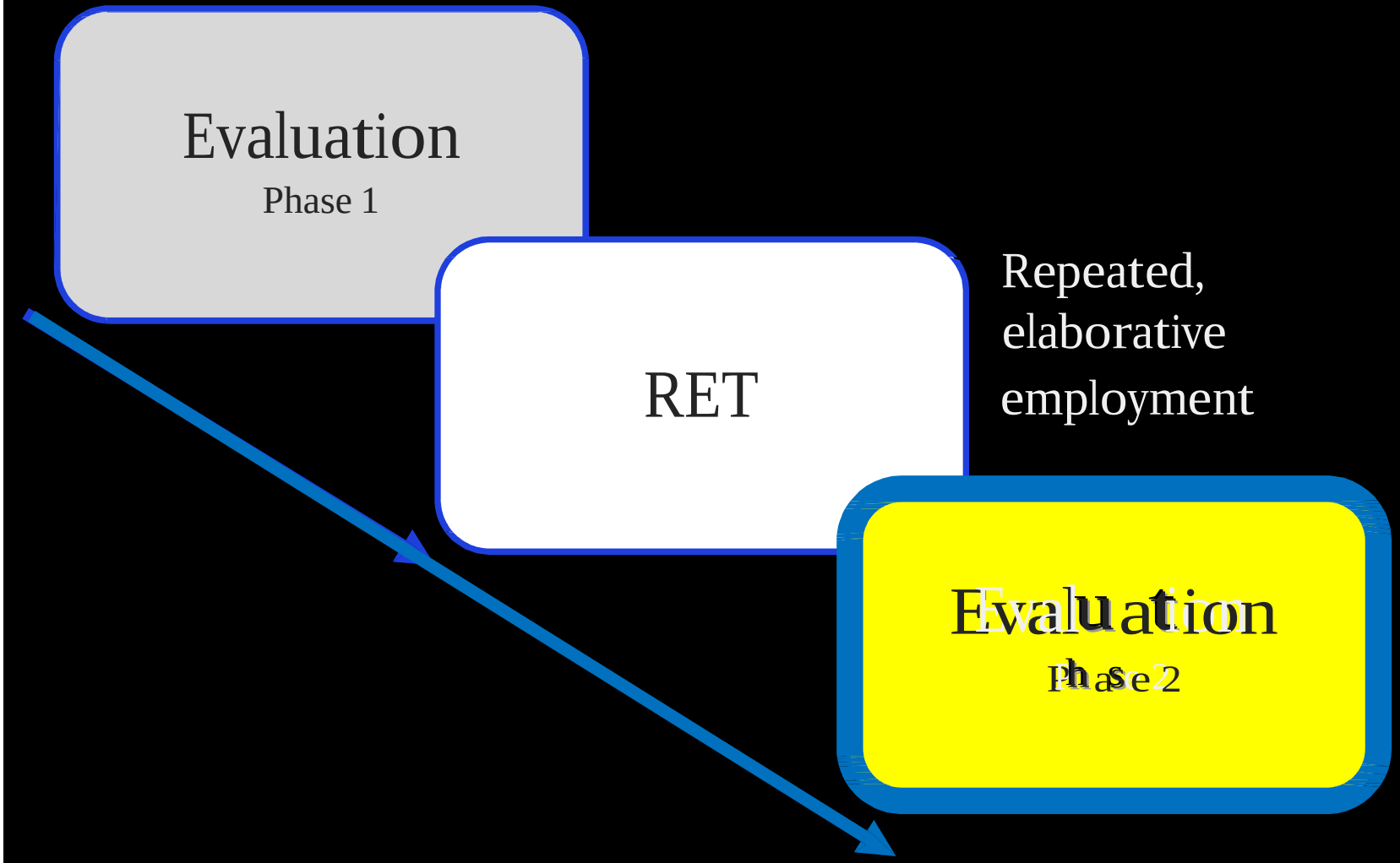
Predictive power

Single shot measurements (without any familiarization and elaboration phase) of products of low familiarity show weak predictability

Counteraction: Evaluators have to elaborate the material first, and only then they should be asked for appreciation

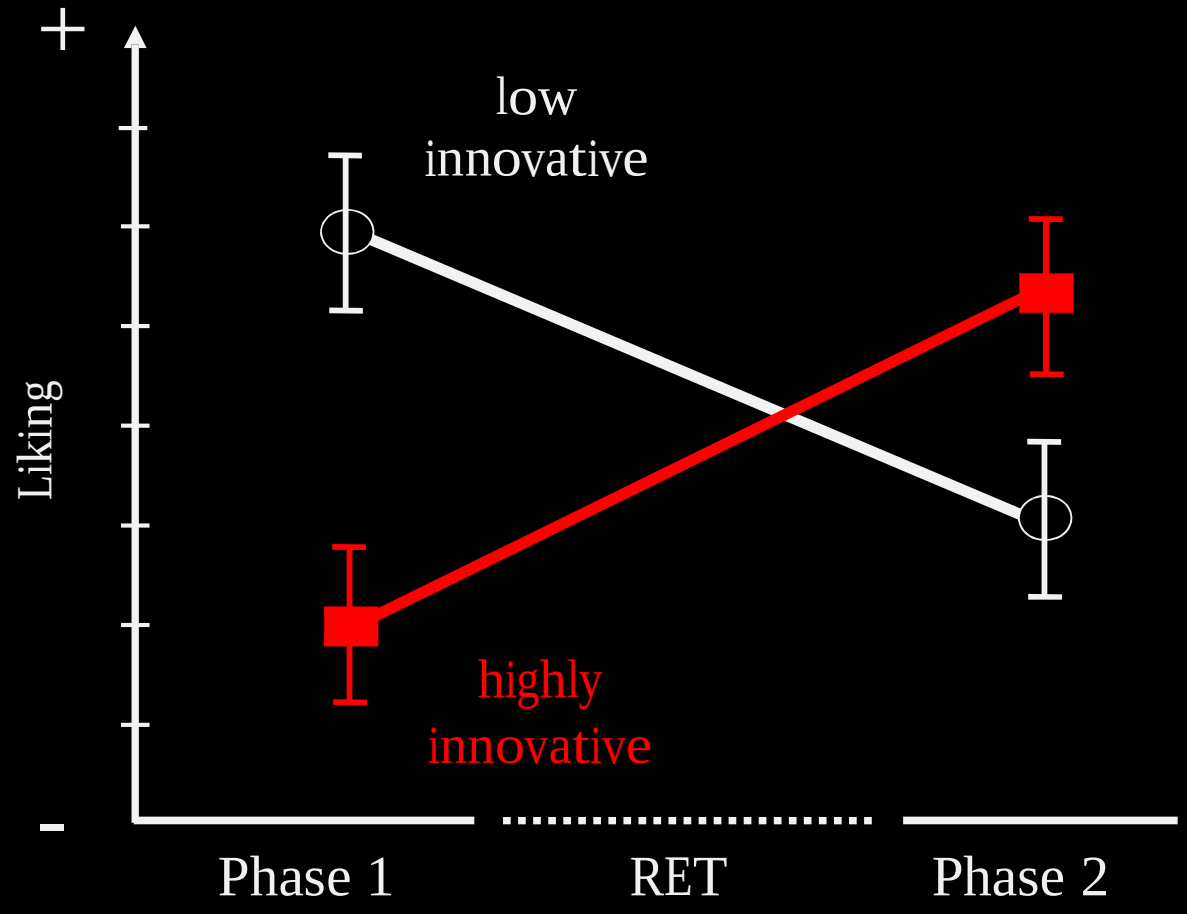
Repeated Evaluation Technique (RET) (Carbon and colleagues: Applied Cognitive Psychology, Psychology Science, Perception, Thexis, Acta Psychologica, Swiss Journal of Psychology, i-Perception, Journal of Experimental Psychology: HPP, SPIE)

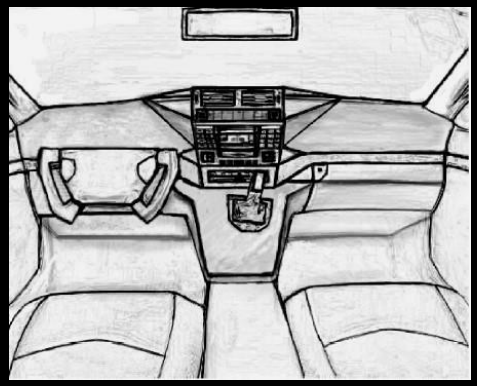
Repeated Evaluation Technique (RET)



Carbon et al. (2005-2017)

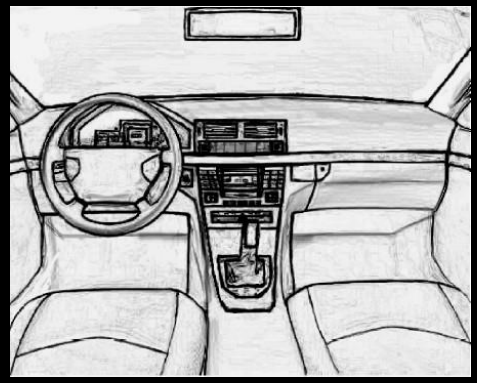
RET





highly innovative

low innovative



Problem #5

Aesthetics is not just about beauty & preference

Measurement

Problem #5:
Beyond simple measures

Real acceptance (e.g. of innovation) goes much further than simply asking people how they like something

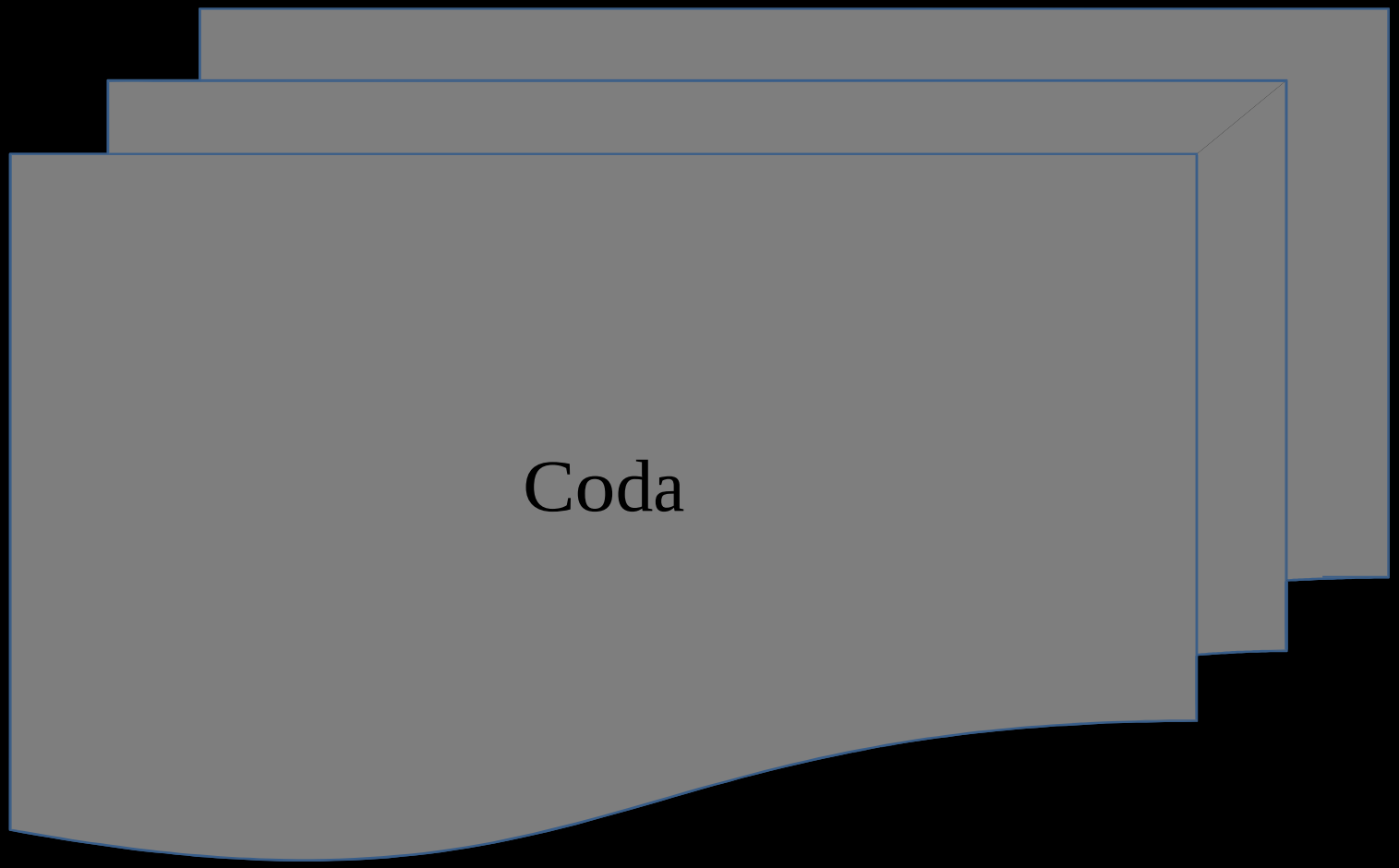
A massive lack of tools and inventories to capture the rich and various experiences people have with technology and design

Carbon (HVEI, 2017)

Own developments

- Car-IDQ (Car-Interior Design Questionnaire)
- IMUDE: Identifying Unique Design Elements
- Emotional Footprint: Assessing what people feel
- md-IAT: Multidimensional & implicit assessments
- BBSI: Measuring how strong a brand is
- CEP: Continous Evaluation Procedure
- RET: Repeated Elaboration Technique
- AET: Active Elaboration Technique

Carbon (2017)


Coda

Coda

- Technology and Design studies often lack psychological theories and empirical research
- Measurement of aesthetic factors is not well developed so far
- Acceptance, especially for innovative designs, cannot be predicted by simple single-shot measures

We need fundamental, systematic psychological theory and practice inherently implemented in these fields in the future

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Thanks for your interest!

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UNIVERSITY OF BAMBERG
OTTO-FRIEDRICH-UNIVERSITÄT BAMBERG