Technology Acceptance among Older People in Japan

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- Technology acceptance and social factors

- Subjective well-being, affective experiences and technology

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Technology Acceptance by Older People

- Older people can, and are willing to accept new technologies
  (Czaja & Sharit, et al., 1996)

- On the other hand, there still exist obstacles for older people to learn an use new technologies.
  (Rogers, et al., 2001)

  <u>Examples of obstacles</u>

  – No feel of warmth in products (Rogers, et al., 2001)

  – Lack of usefulness (Tsukada & Saito 2006)

  – Perception of risk (Rott et al., 1988)

- Focuses have been on technology and users

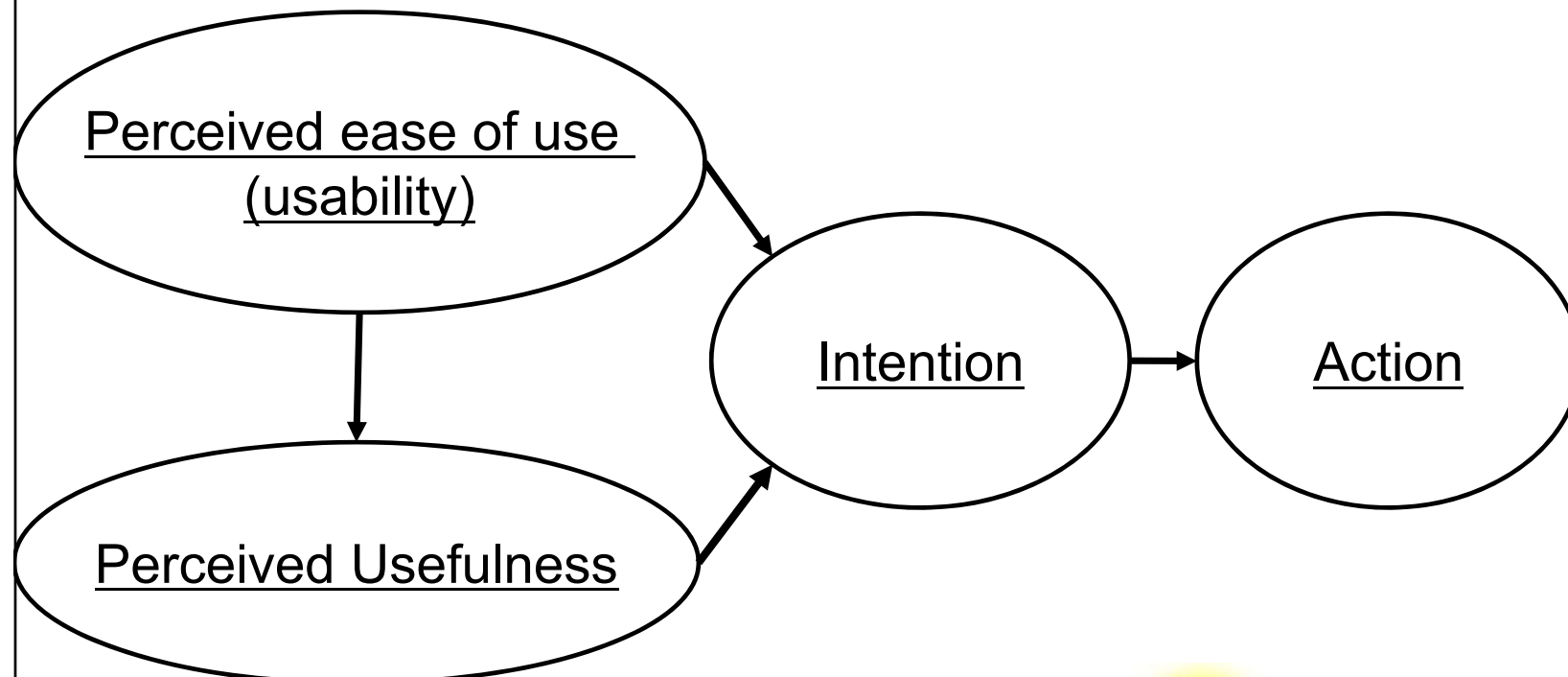 *cf*. TAM: perceived ease-of-use, perceived usefulness

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Existing Models: Social Motivation Studies

- Traditional Technology Acceptance Model (TAM)

Perceived ease of use (usability) → Intention → Action

Perceived Usefulness → Intention

- **Technology Characteristics**

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Social Factors

- Some researchers focused on social factors related to technology acceptance of older people
  - Respectability (Asahara et al., 2001)
  - Not wishing to change one's own life (Tavener-Smith & de Vet, 2006)

- Other kinds of social factors?

  e.g.
  - I will use it because people around me do.
  - I would like to buy in order to show it off to others

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Social Motivation Studies

- <u>Social motivations</u> have significant influence on people's intention for behavior (Fujita, 2003)

- Social Motivation

  - Motivations developed in relation with others in processes of social lives.

  - Murray (1938) organized categories of social motivation

    e.g. exhibition - wish to attract attention

    autonomy - with for autonomous decision

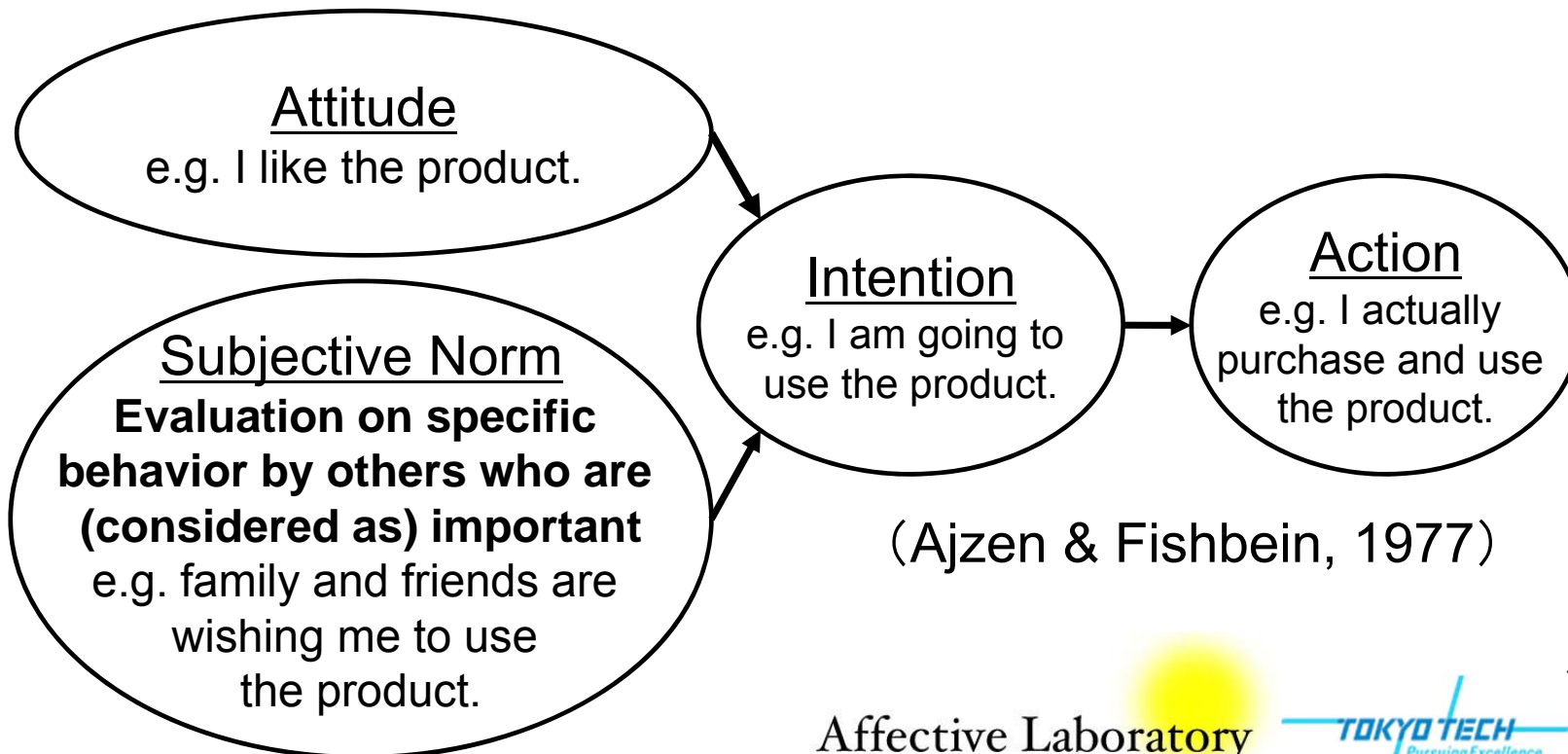Do social motivation imply social factors for technology acceptance?

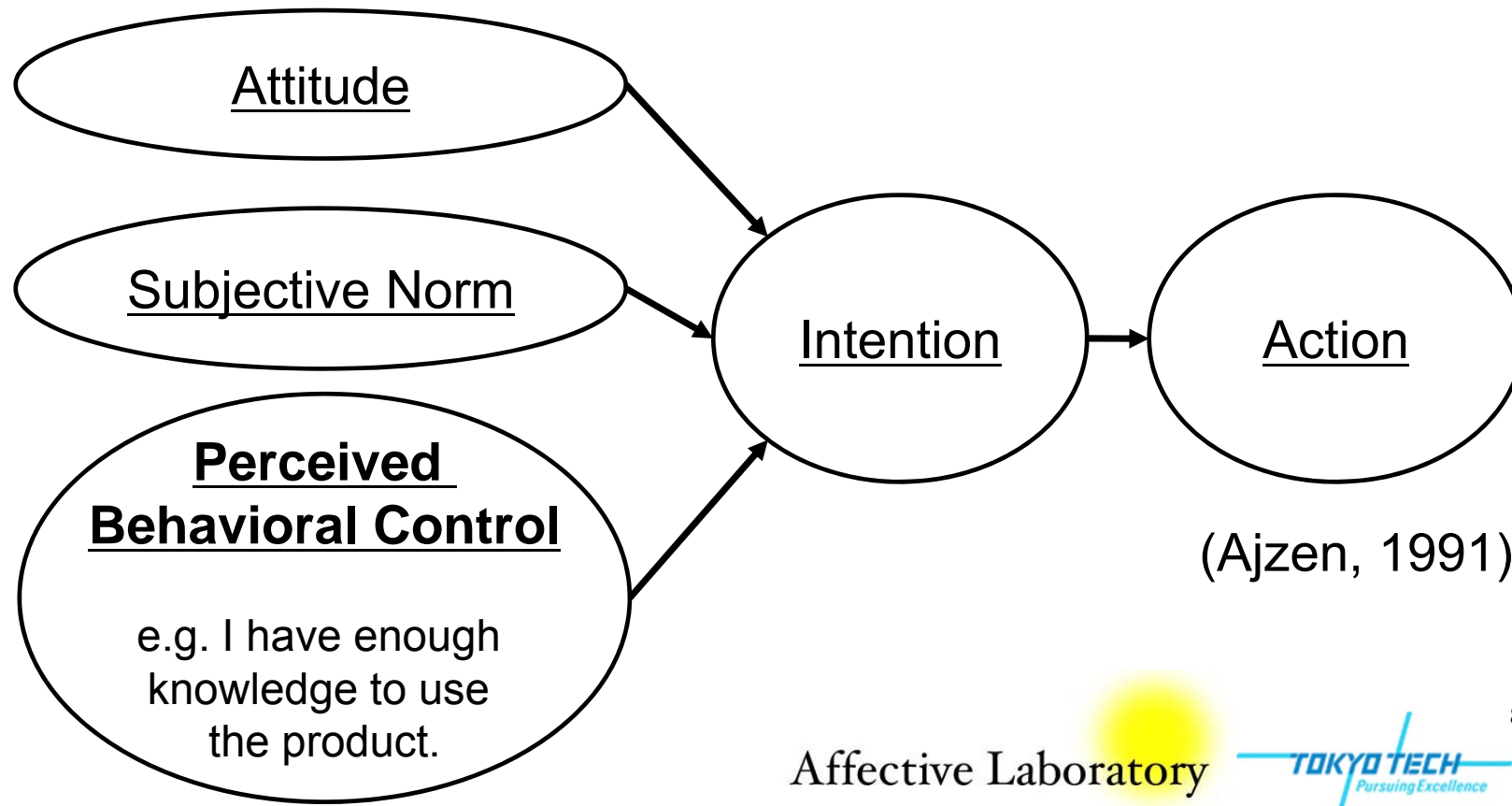Affective Laboratory   *TOKYO TECH*
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Existing Models: Social Motivation Studies

- ## Theory of Reasoned Action (Ajzen & Fishbein, 1977)

Attitude
e.g. I like the product.

Intention
e.g. I am going to
use the product.

Action
e.g. I actually
purchase and use
the product.

Subjective Norm
**Evaluation on specific
behavior by others who are
(considered as) important**
e.g. family and friends are
wishing me to use
the product.

（Ajzen & Fishbein, 1977）
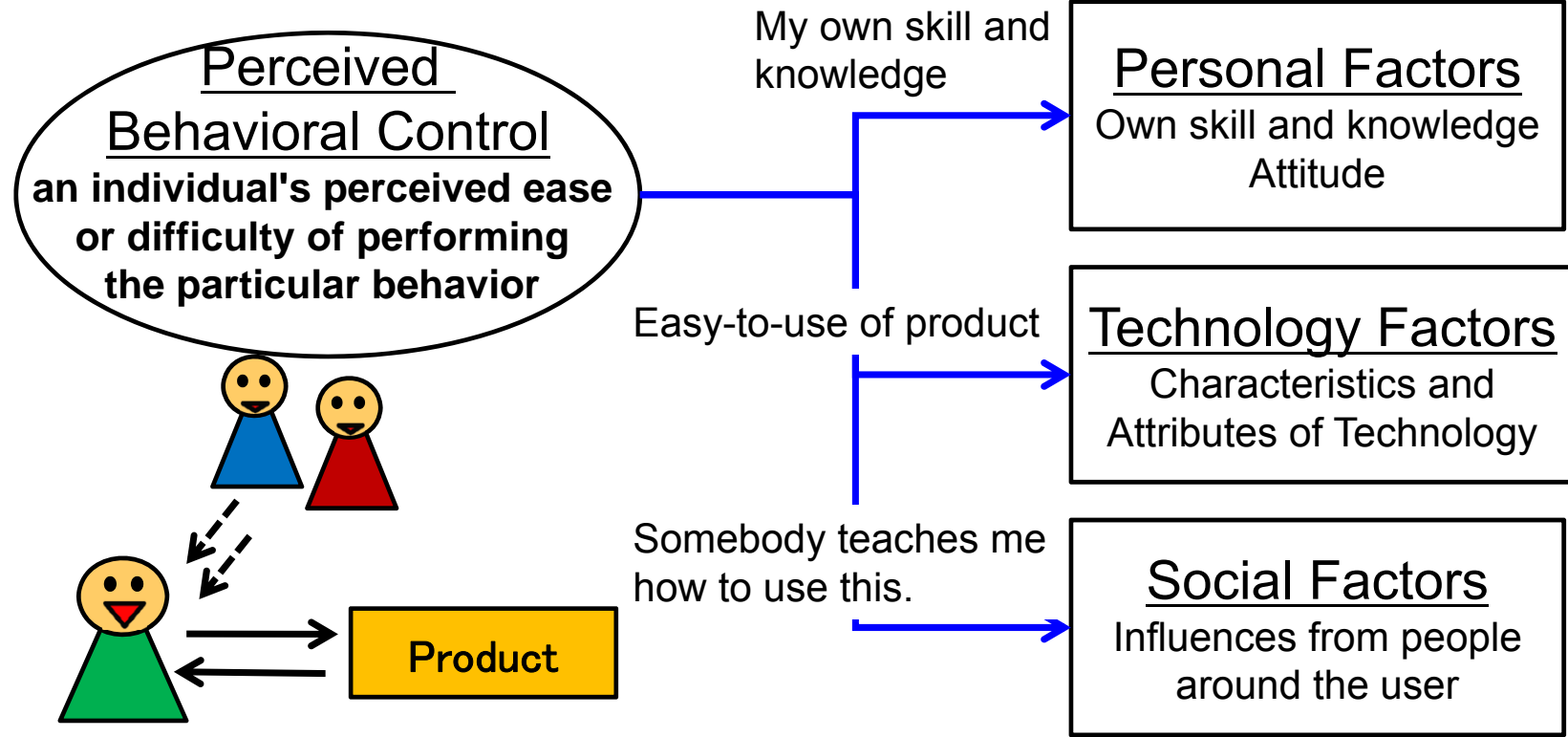
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Existing Models: Social Motivation Studies

- Theory of Planned Behavior (Ajzen, 1991)

Attitude

Subjective Norm

Perceived Behavioral Control

e.g. I have enough knowledge to use the product.

Intention

Action

(Ajzen, 1991)

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Perceived Behavioral Control

Perceived Behavioral Control (ellipse)
an individual's perceived ease or difficulty of performing the particular behavior

My own skill and knowledge

Personal Factors
Own skill and knowledge
Attitude

Easy-to-use of product

Technology Factors
Characteristics and Attributes of Technology

Somebody teaches me how to use this.

Social Factors
Influences from people around the user
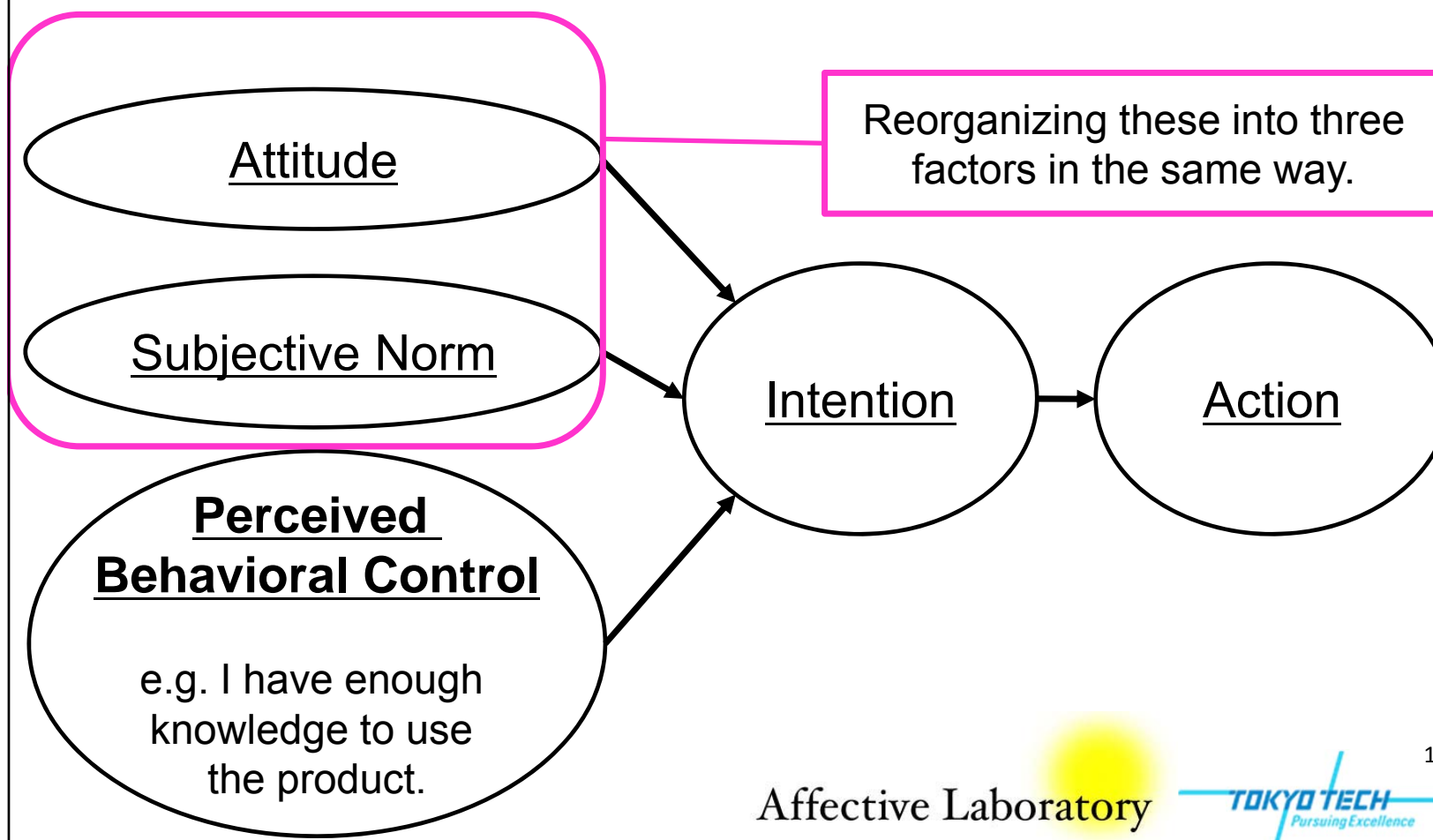
Product
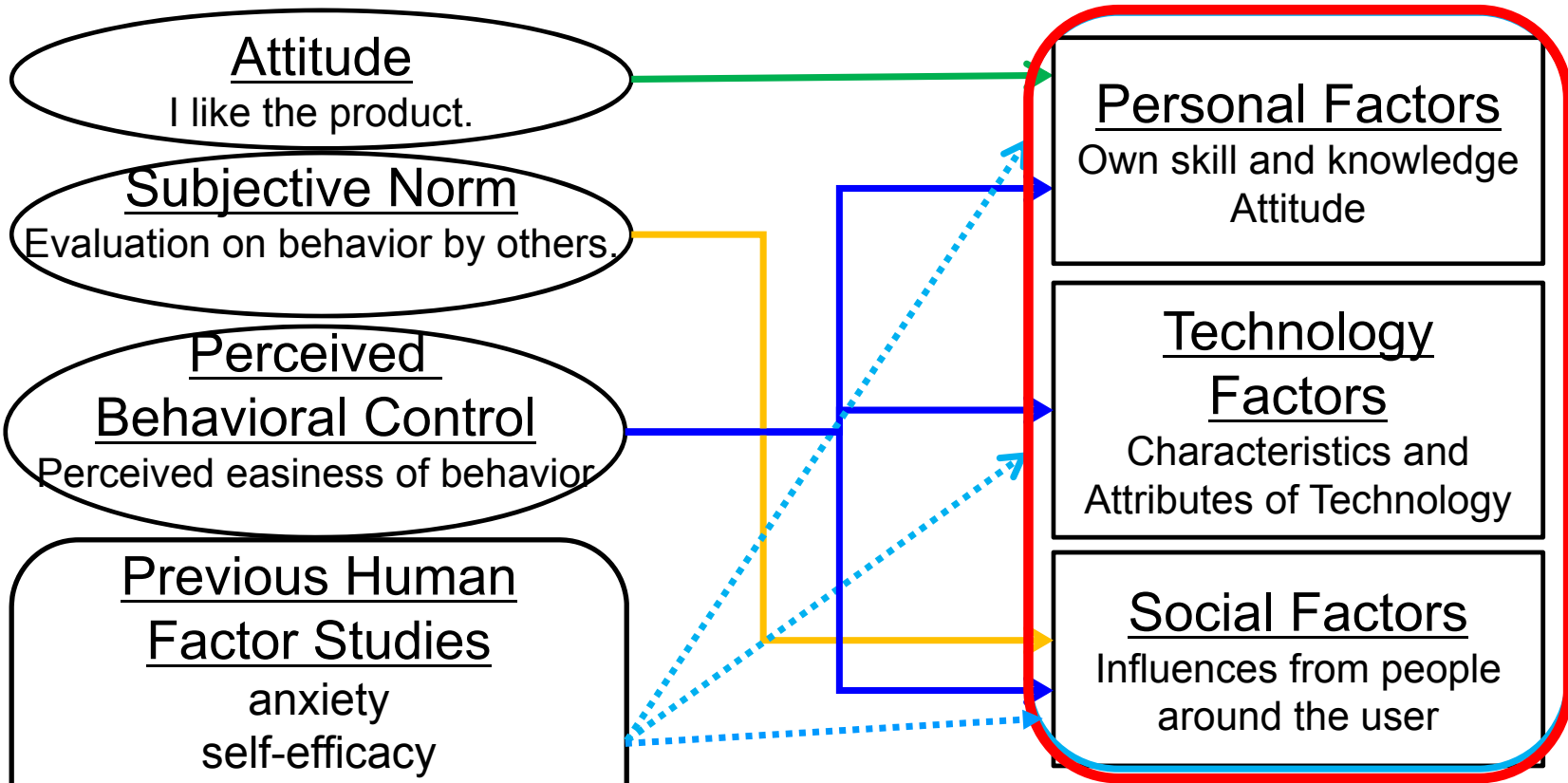
Perceived Behavioral Control might consists of personal, technology and social factors.

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Reconstructing Theory of Planned Behavior

Attitude

Subjective Norm

Reorganizing these into three factors in the same way.

Perceived Behavioral Control

e.g. I have enough knowledge to use the product.

Intention

Action

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Personal, Technology, and Social Factors

Attitude
I like the product.

Subjective Norm
Evaluation on behavior by others.

Perceived Behavioral Control
Perceived easiness of behavior

Previous Human Factor Studies
anxiety
self-efficacy
motivation
Usability
respectability etc.

Personal Factors
Own skill and knowledge
Attitude

Technology Factors
Characteristics and Attributes of Technology

Social Factors
Influences from people around the user

Any other factors to be included?

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Hofstede's Cultural Dimensions

source:
http://www.geert-hofstede.com
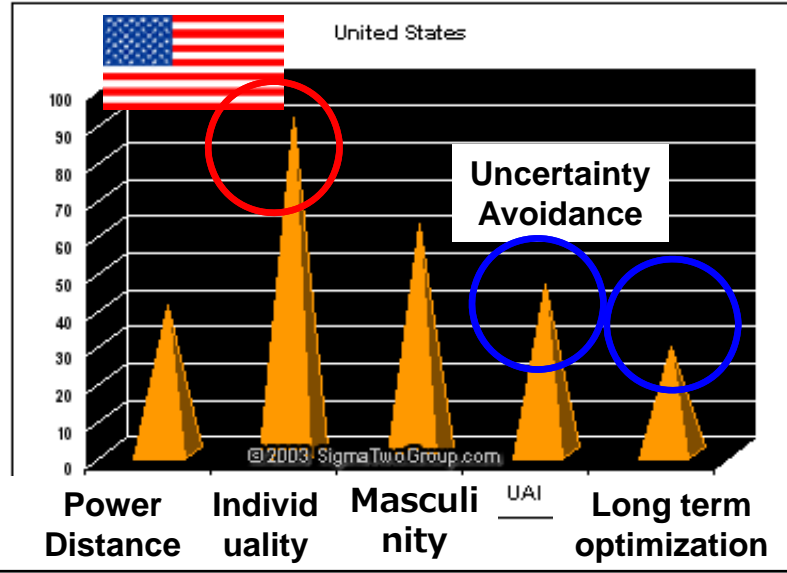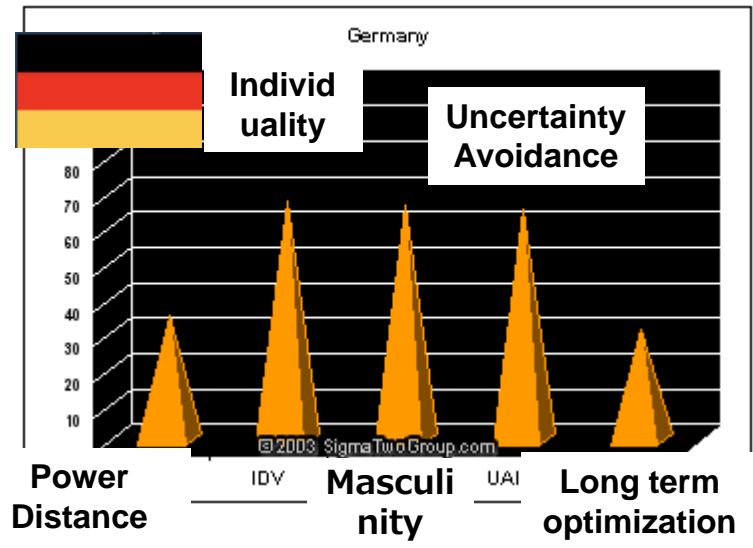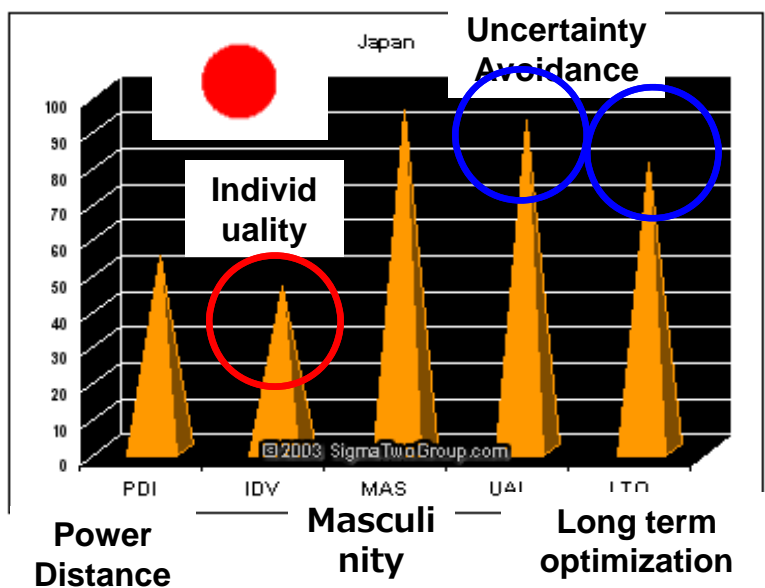
Interview with Developer of Products for Elderly

- Focus Group Interview with Older People
  - Older adults aged over 60
  - own experiences (cues) when started to use some of technology products.
  - With demonstration of new technology, intention to use, and in what situations.

- Interview with Developer of Products for Elderly
  - development team of cell phone models designed for older users (NTT docomo).
  - How older people start to use their cell phones
  - Who are supporting older users to learn usage

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Factors Discovered through Interviews

- Personal Factors

  <u>Self esteem</u>: "Owning this product makes me proud."

  <u>Purpose or benefits</u>: "Necessary for my job."

- Technology Factors

  <u>Aesthetics</u>: "I own this because its design is beautiful"

  <u>Safety</u>: "I will not use if the product is dangerous."

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Factors Discovered through Interviews

- Social Factors

Murray's Social Motivation

"I use the product if people use it." ——— **Deference**

"I use the product if I can use it with others."— **Affiliation**

"I want to show off this product to others" ——— **Exhibition**

"I want to teach others how to use this." ——— **Care**
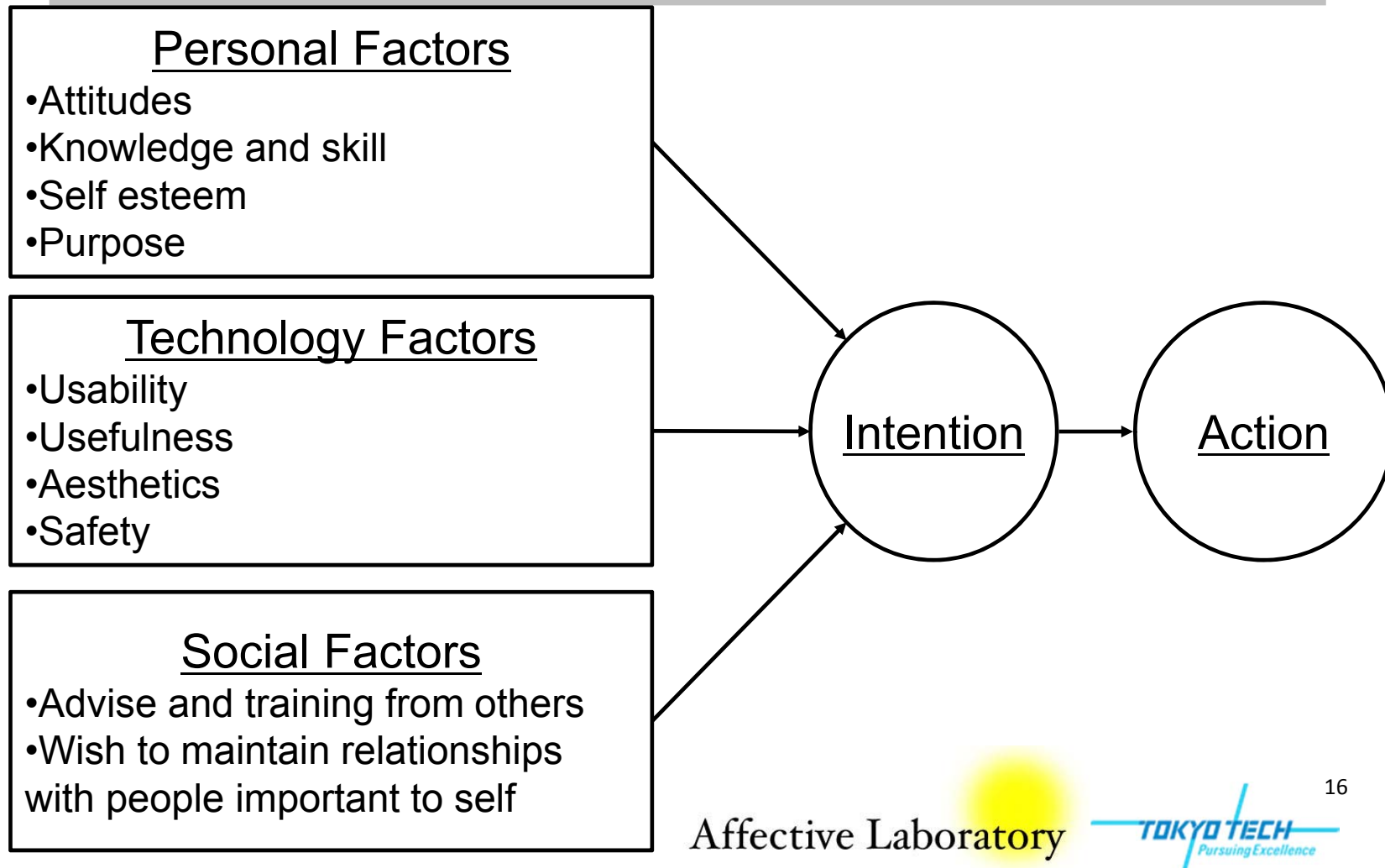
"I hate to be seen by others ——— **Humiliation avoidance**
   when I fail to use"

<u>Social Motivations that reflects wishes to maintain good relationships with others</u>

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Proposed Technology Acceptance Model

Personal Factors
- Attitudes
- Knowledge and skill
- Self esteem
- Purpose

Technology Factors
- Usability
- Usefulness
- Aesthetics
- Safety

Social Factors
- Advise and training from others
- Wish to maintain relationships with people important to self

Intention → Action

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Future Work

- **Comparative study with other cultures**
- **Constructs of well-beings older people can obtain from technology**

- Further detailed analysis
  - Segmentation of older people
    - Personal attributes
  - Stratification of products according to actual usage
    - Products that have been actually used
    - Products that are considered for (future) usage
- Possibility of existence of other factors, especially social ones.

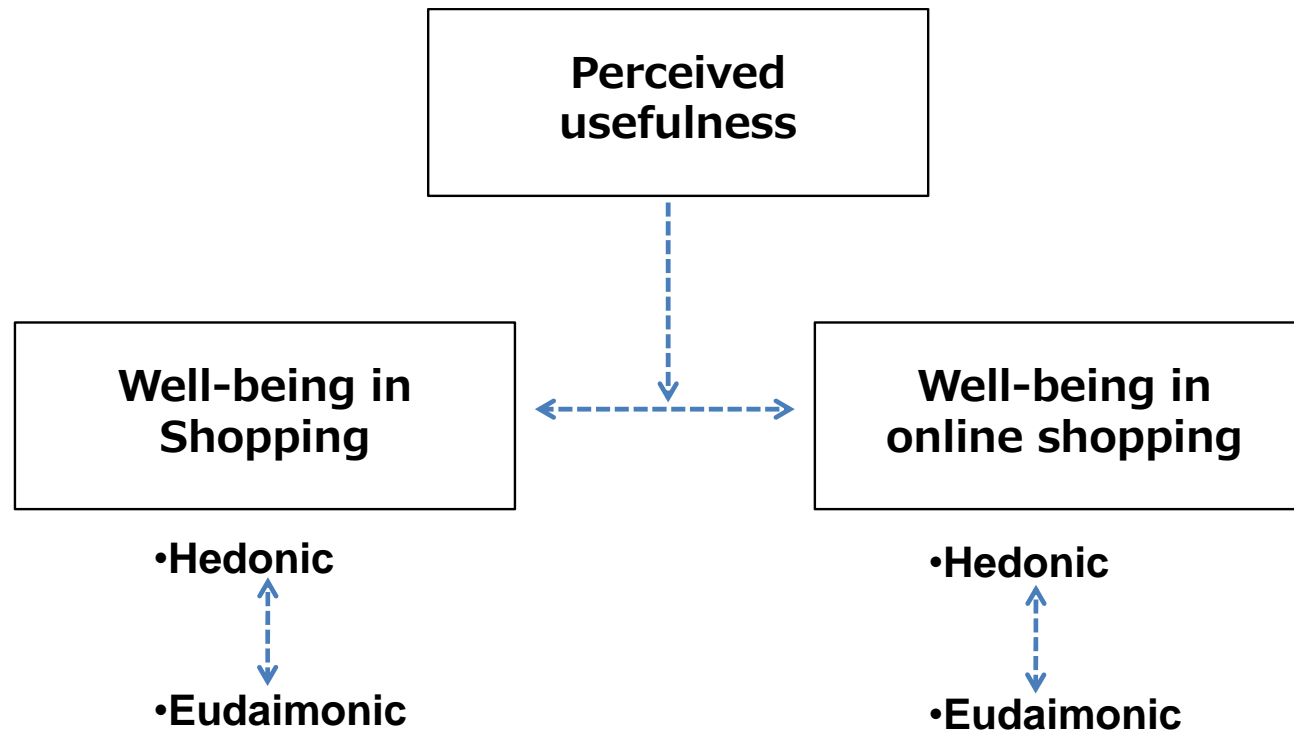Affective Laboratory   *TOKYO TECH Pursuing Excellence*
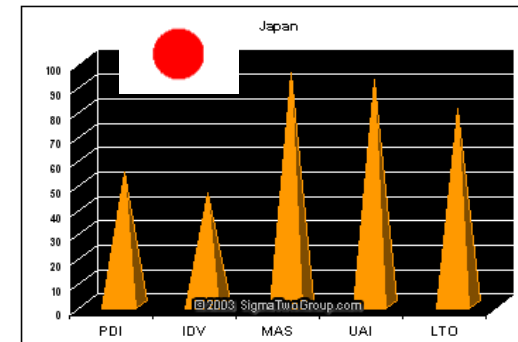
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Well-being by technology

- Well-being: optimal psychological functioning and experience (Ryan & Deci,2001).
- The formation of two relatively distinct, yet overlapping, perspectives.
  - **Hedonic well-being (HWB)**
  - **Eudaimonic well-being (EWB)**
  - In some studies, they were called "pleasure and joy".

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Does shopping experience affect online shopping experience?

Perceived usefulness

Well-being in Shopping

•Hedonic

•Eudaimonic

Well-being in online shopping

•Hedonic

•Eudaimonic

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Affect

- *affect* (psyc.) = general term representing human affective status including emotion, mood, feeling

- Includes both positive and negative

- *affection* = a feeling of gentle love and caring

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Defining *affectiveness*

Def.:

1. How objects or people are capable to evoke affective responses (or affective experiences) among other people.

2. How people are capable to deliberate possible affective responses as results of their existence and/or actions.

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Affective Technology

- Not just being easy to use.
- Owning it is happy and proud.
- When using, comfortable and satisfied.

 such technology products / services
  ≡ *__affective technology__*

When people use technology:

- when do they feel joy and pleasure?
- when do they become absorbed?
- any individual difference in the ways they feel happy?

→ How can we make "affective technology"?

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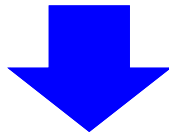   Pursuing Excellence

Viewpoint of Human Factors

- Learn human characteristics
  - Perception
  - Cognition
  - Psychomotor
  - Affectivity (human characteristics in terms of affective responses)

•**Culture**
•**Lifestyle**
•**Value system**
•**Personality**

- Apply for design

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Future perspectives

- A number of questions to be answered:
  - In what situations / conditions people experience affects?
  - What factors of products / services are essential to elicit affects?
    - cf. affective quality (Zhang & Li, 2005)
  - How can we measure *affectiveness*?
    - both attributes of artifacts and affective responses of human
  - Diversification across:
    Individual, cultures, generations etc
  - How can we make affective technology / service in practice?

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Implications

- (At least in Japan,) social factors have to be considered to promote older people's acceptance of technology.

- Affective characteristics of older people have to be learned
  - in addition to perceptual, cognitive, and psychomotor characteristics,
  - in relation with culture, lifestyle, value systems

- Technology should be designed to enhance hedonic/eudanimonic well-being
  - in addition to conventional subjective / objective well-beings

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Thank you!

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