Technology Acceptance Models

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The Evolution of (Tech) Adoption Theory

1 — In the Beginning…

Diffusion of Innovations (Rogers, 1962, 1995)

Theory of Reasoned Action (Fishbein & Ajzen, 1975)

2 — TAM was born

Technology Acceptance Model (Davis, 1986, 1989)

Antecedents of Perceived Ease of Use (Venkatesh & Davis, 1996)

Theory of Planned Behavior (Ajzen, 1985, 1991)

3 — Extending Extensions

Determinants of Ease of Use (Venkatesh, 2000)

TAM 2 (Venkatesh & Davis, 2000)

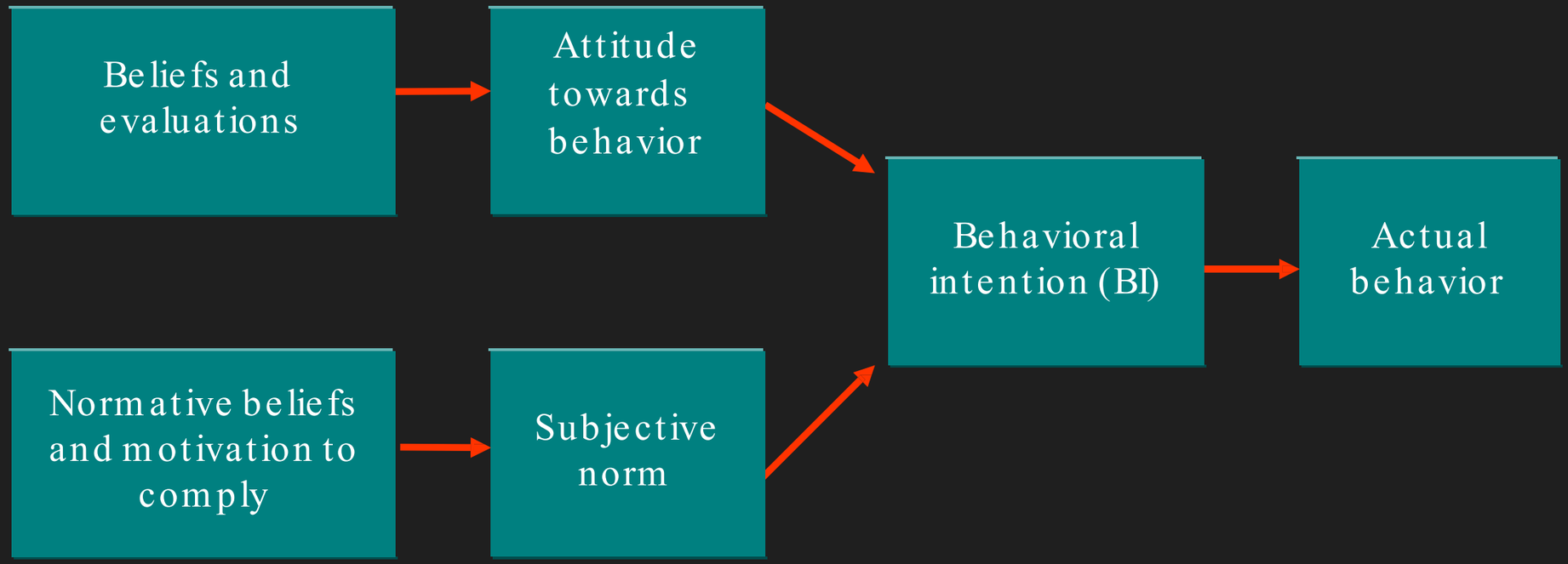
Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, G. Davis, & F. Davis, 2003)

4 — What in the Parsimony?

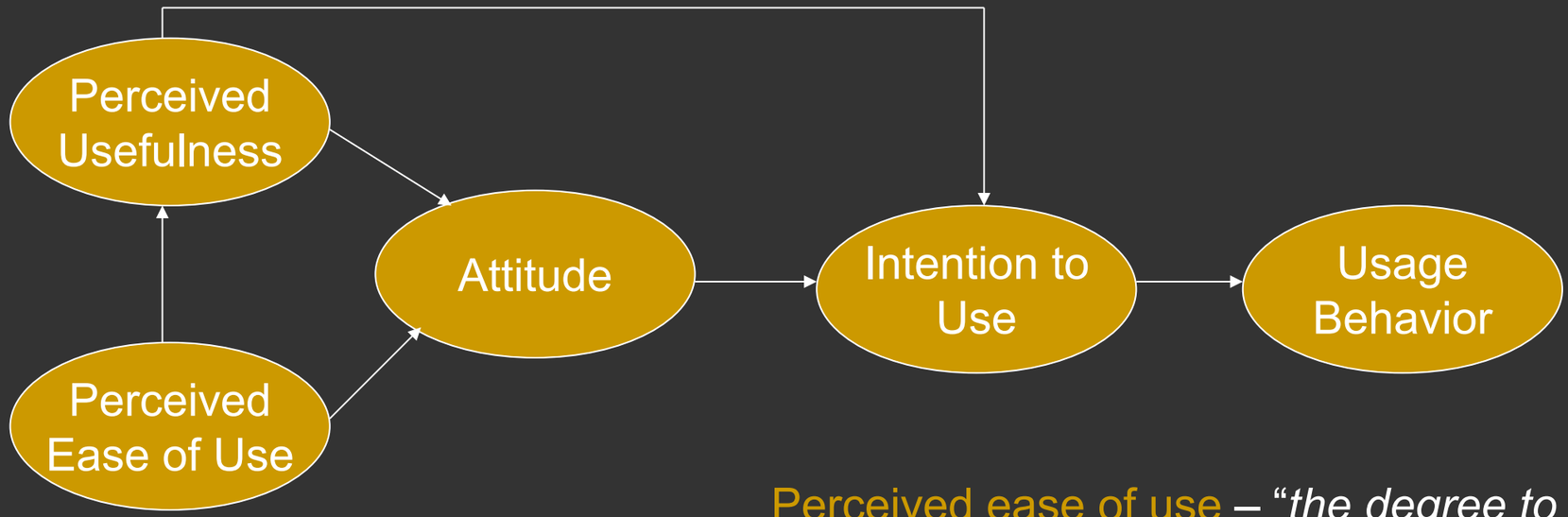
TAM3 (Venkatesh & Bala, 2008)

UTAUT2 (Venkatesh, Tong, Xu, 2012)

Theoretical Framework (TRA)



TAM (Original)

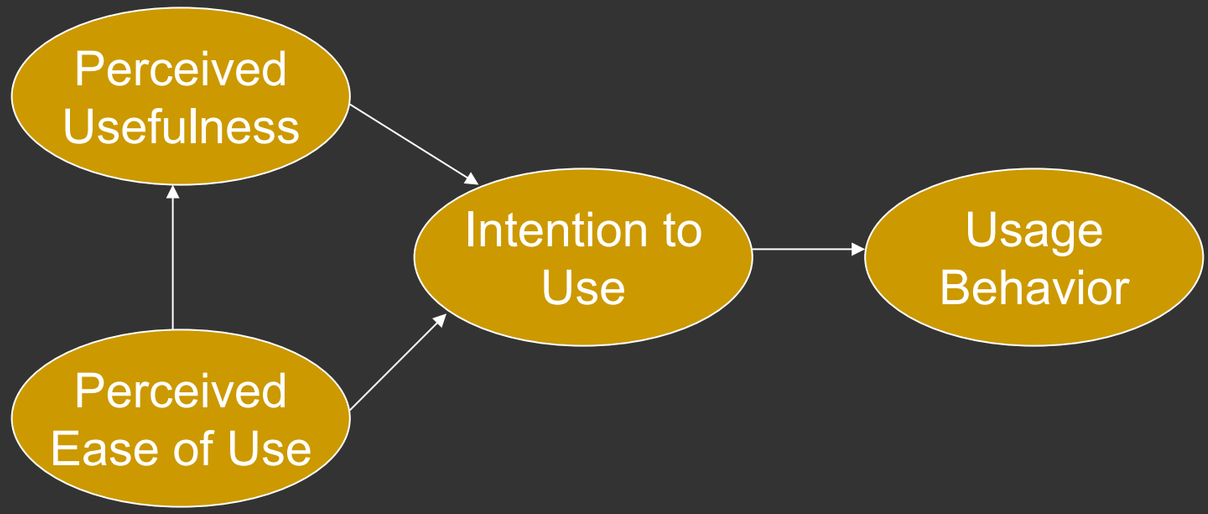


Davis (1989)

Perceived ease of use – *"the degree to which a person believes that using a particular system would be free of effort"* (Davis, 1989, p. 320)

Perceived usefulness – *"the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320)*

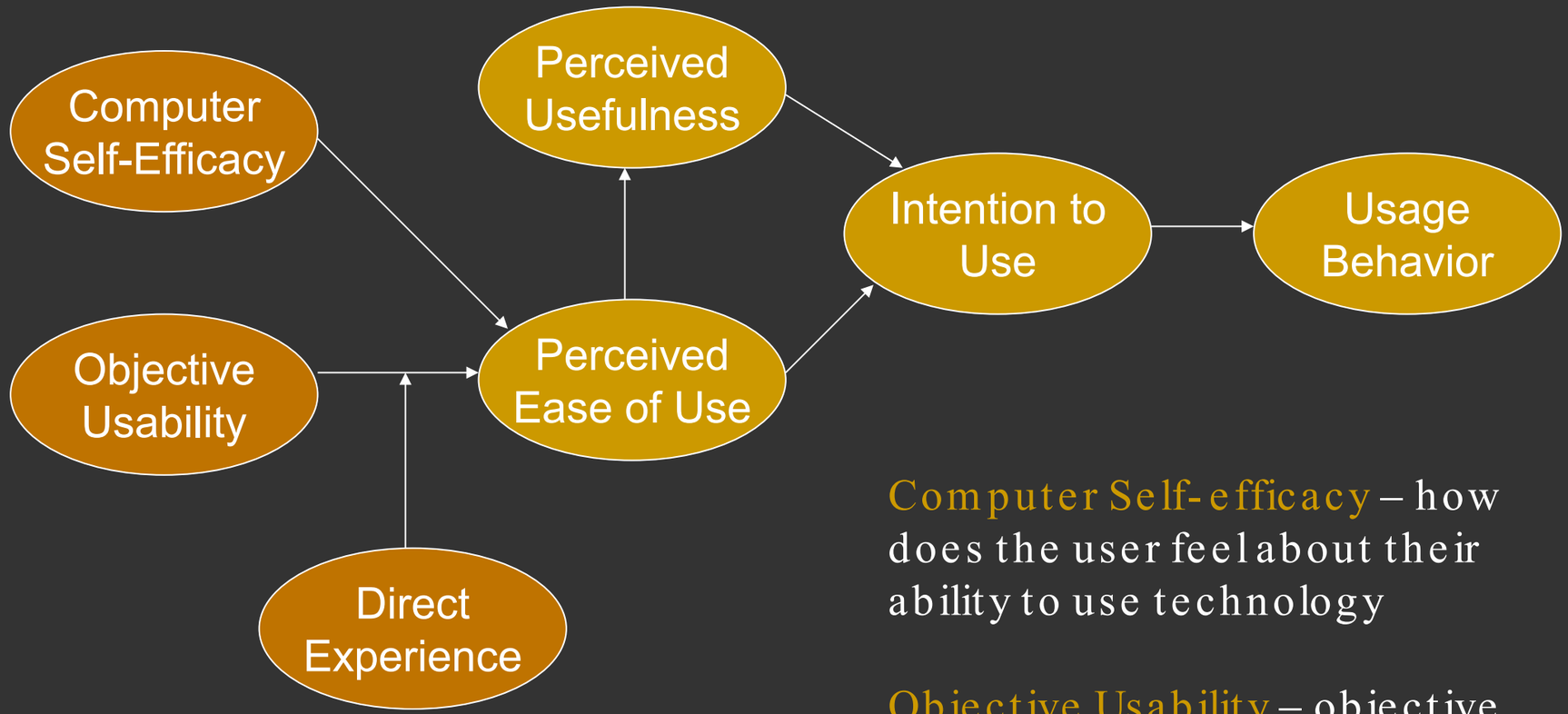
TAM (Parsimonious)



Davis, Bagozzi, and Warshaw (1989)

Technology: WriteOne, word processor
Sample Size: 107 MBA students

Antecedents of Perceived Ease of Use

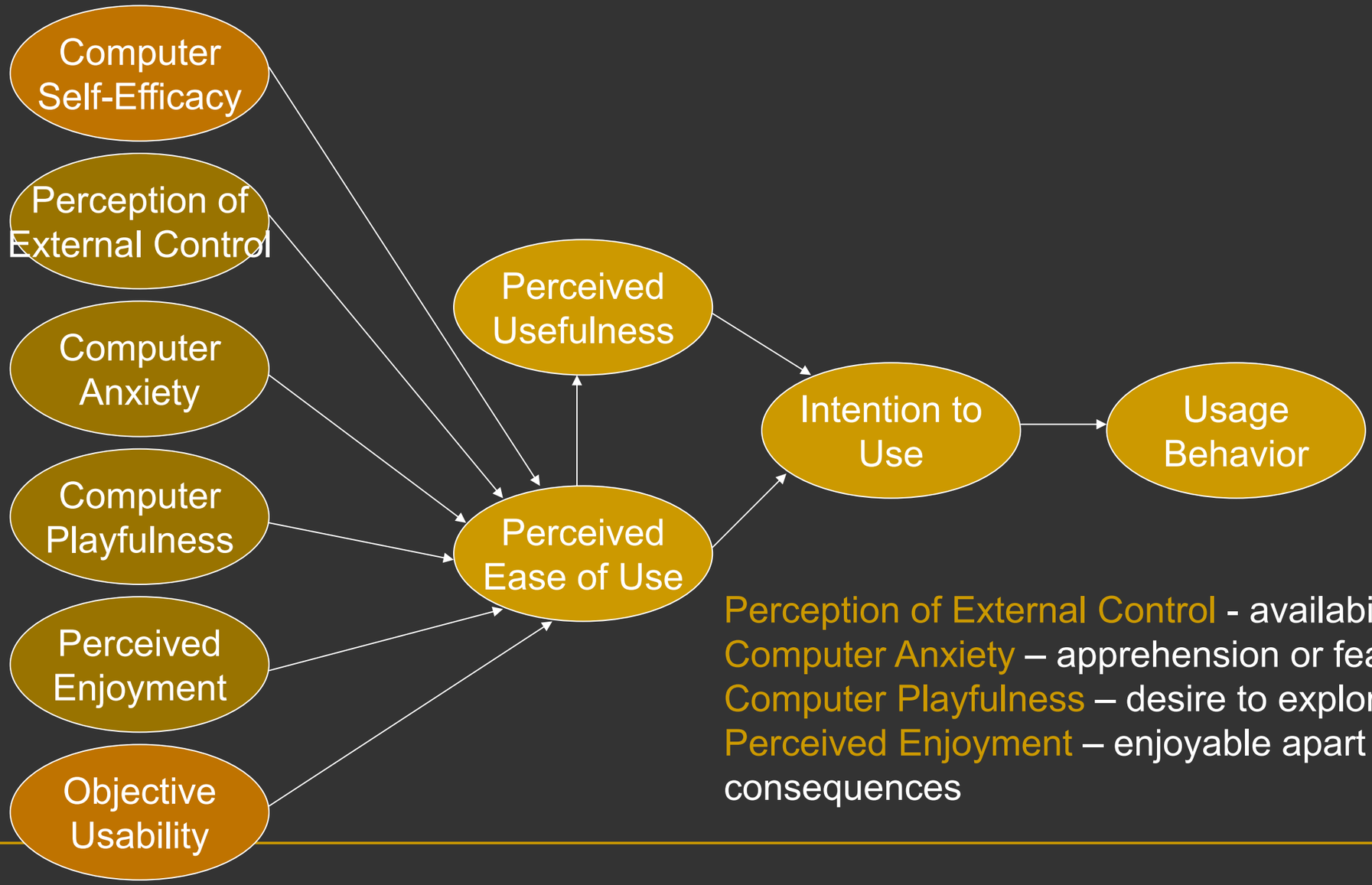


Venkatesh and Davis (1996)

Computer Self-efficacy – how does the user feel about their ability to use technology

Objective Usability – objective system measures, e.g., keystroke model, expert to novice performance comparison

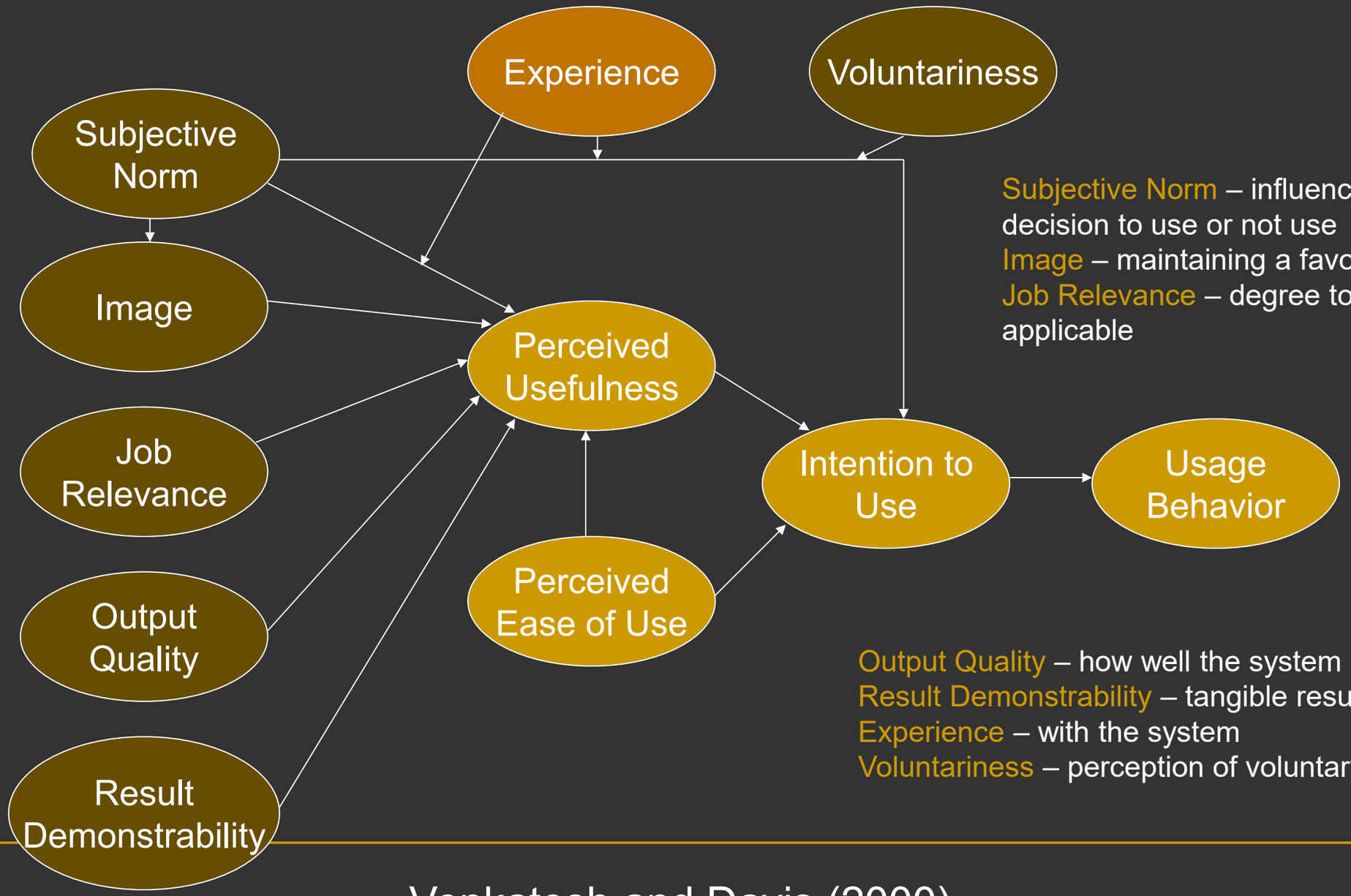
Antecedents 2.0



Perception of External Control - availability of support staff
Computer Anxiety – apprehension or fear
Computer Playfulness – desire to explore and play
Perceived Enjoyment – enjoyable apart from performance consequences

Venkatesh (2000)

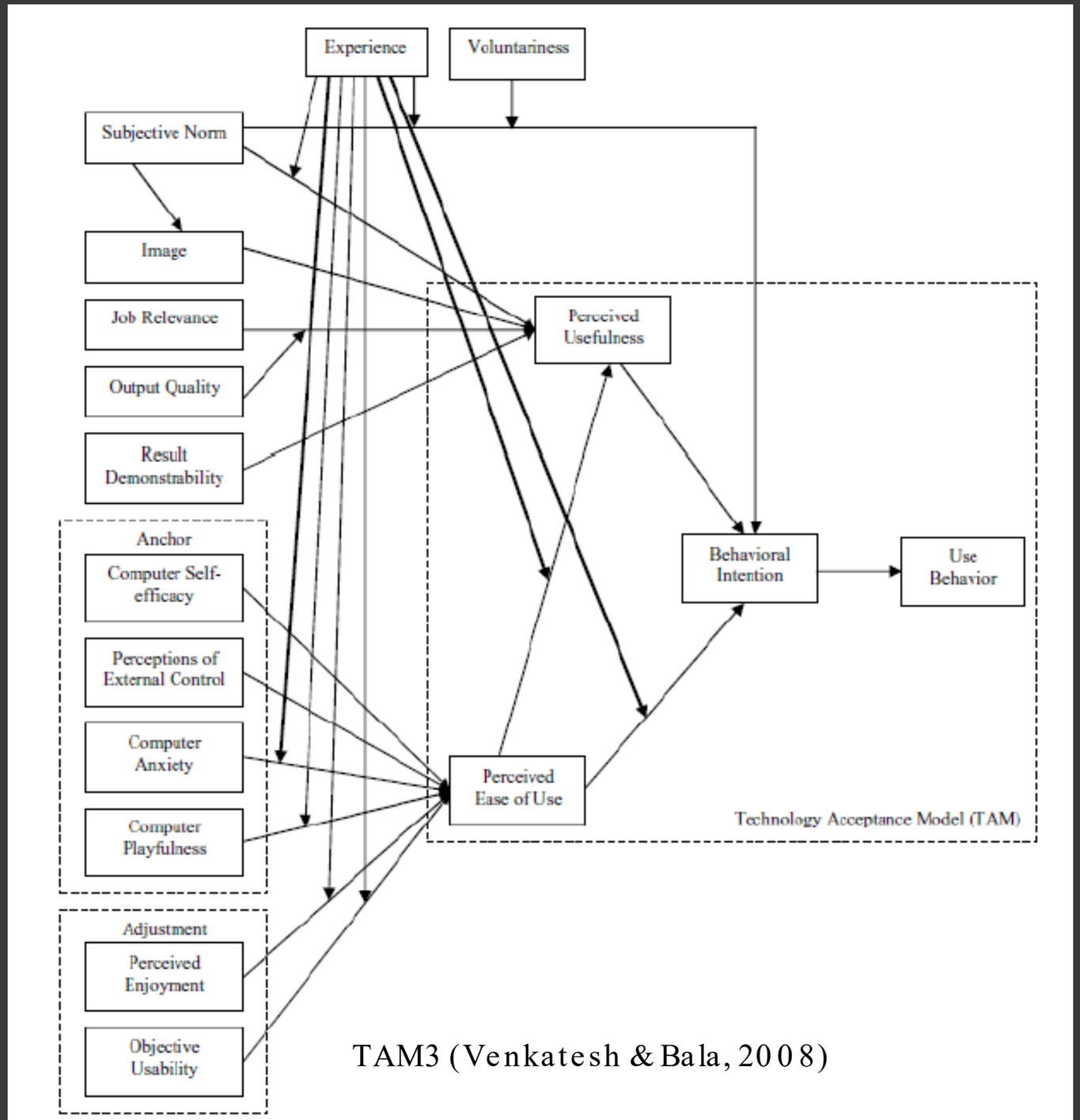
TAM2



Subjective Norm – influence of others on user's decision to use or not use
Image – maintaining a favorable standing
Job Relevance – degree to which the target system is applicable

Output Quality – how well the system performs tasks
Result Demonstrability – tangible results
Experience – with the system
Voluntariness – perception of voluntary/mandatory use

Venkatesh and Davis (2000)



TAM3 (Venkatesh & Bala, 2008)

Perceived Usefulness
Perceived Ease of Use
~~Attitude~~
Computer Self-Efficacy
Objective Usability
Direct Experience (Experience)
Computer Anxiety
Computer Playfulness
Perceived Enjoyment
Subjective Norm
Image
Job Relevance
Output Quality
Perception of External Control
Result Demonstrability
Voluntariness
Intention
Use

Why do people accept or reject technology?

And why do we care?

1 **Connections to Health**

Improved outcomes

2 **Main Variables**

It’s not as complicated as it seems

3 **Health..for whom?**

That said... we have some work to do.

Technology and health

1 Consumer-Focused HIT Interventions

Not connected to practitioners

Websites, apps, and wearable devices

Improved health outcomes

Example: Kazemi et al. (2017) found mHealth interventions effective in reducing substance abuse.
Example: Uhrig et al. (2012) showed significant risk reduction behaviors among HIV-positive men using a tailored SMS-based intervention.

2 Practitioner-Focused HIT

Clinicians and healthcare administrators

Reduce costs, medical errors, improve clinical decision-making and patient-centered care

3 System Users

Speaking of clinicians and healthcare administrators…

Senteio & Magsamen-Conrad (in press)

Technology and health

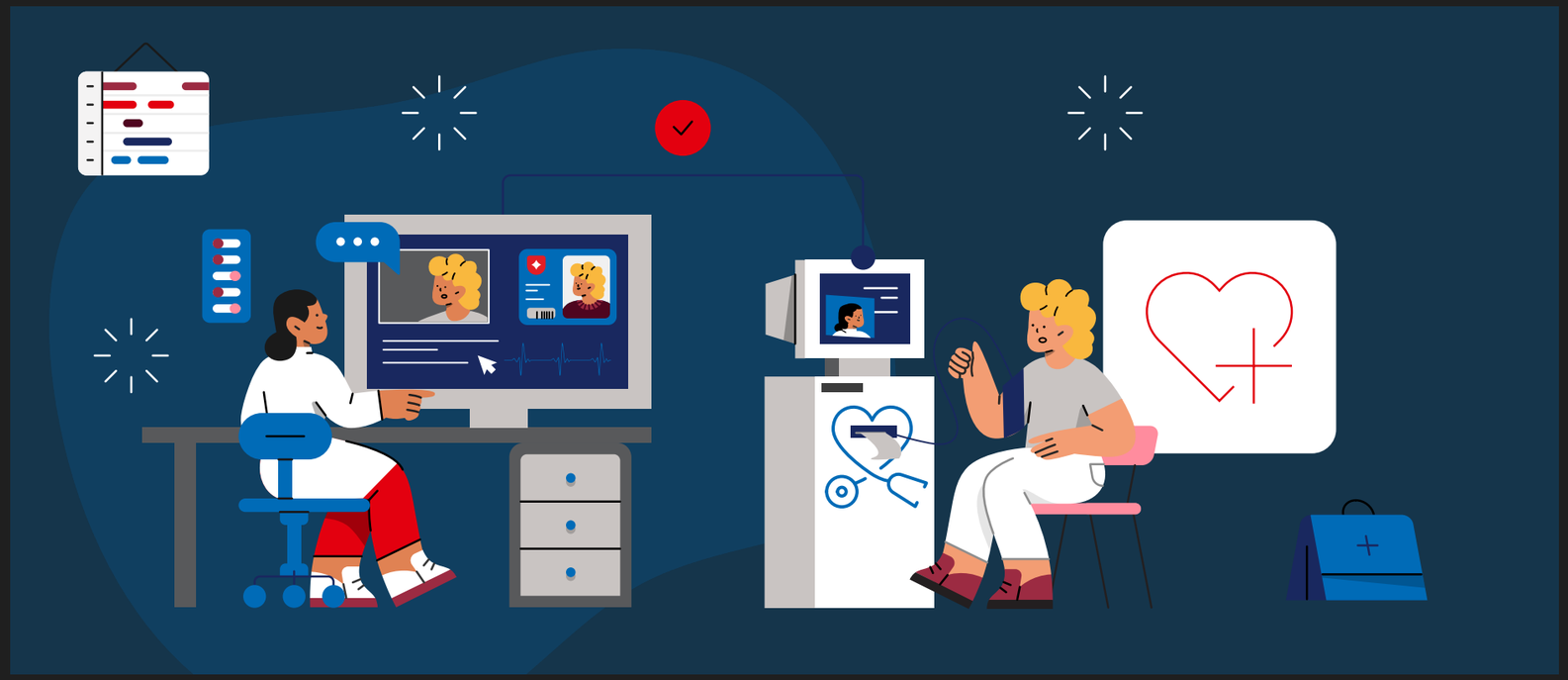
1 Consumer-Focused HIT Interventions

Not connected to practitioners

Websites, apps, and wearable devices

Improved health outcomes

Example: Fischer et al. (2010); Sarfati et al. (2019) on reducing costs and improving care.
Example: Low et al. (2013) on cost savings for providers, healthcare delivery organizations, and payers.



2 Practitioner-Focused HIT

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Reduce costs, medical errors, improve clinical decision-making and patient-centered care

Senteio & Magsamen-Conrad (in press)

Advantages of HIT Interventions

Improved Access

HIT provides health resources where otherwise unavailable, increasing access to health information and support.

Cost-Effectiveness

Telemedicine and other HIT solutions often prove more cost-effective than traditional face-to-face alternatives.

Tailored Content

HIT enables personalized health interventions based on individual needs and medical conditions.

Remote Monitoring

Allows for unobtrusive mood tracking and remote health status monitoring, enabling timely interventions.

Senteio & Magsamen-Conrad (in press)

Technology and health

National Institutes of Health pathways to prevention workshop: Improving rural health through telehealth-guided provider-to-provider communication

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Speaking of clinicians and healthcare administrators…

Wakefield et al., 2024; Aidoo & Magsamen-Conrad, in preparation

Construct: Performance Expectancy AKA Perceived Usefulness	
Definition	Individuals' assessment of the technology as beneficial to adopt over their current approach. Derives from the impression that the technology is personally effective, useful, and efficient.
Theoretical Derivative	DOI; TAM; UTAUT
Individual-level HIS Application	Perceptions related to the benefit of the particular HIS are important for both patients and practitioners. Both need to believe the HIS is superior to the systems they already have in place, is useful, and will work with what they currently use.
Organizational-level HIS Application	Whether the HIS helps further positive health outcomes due to system superiority should be evaluated because of, and despite, the expense and effort of the HIS implementation.
Narrative Example: Patient	Naomi has been using a lancet to monitor her diabetes at home. However, her doctor wants her to transition to a digital glucometer. While initially resistant, Naomi is willing to use the new device after learning it can watch her glucose levels while she sleeps and alert her if she experiences sudden drops or spikes. She believes this to be far superior to waking up hyper or hypoglycemia.
Narrative Example: Practitioner	Dr. Smith's health care organization wants all employees to input information into the digital files of their new HIS. Dr. Smith thinks the paper records are easier to use and maintain. However, after learning that a digital archive is much like a written archive, but superior in their searchability, enabling more expedient critical health evaluations for their patients. Dr. Smith begins to type rather than handwrite patient notes and keeps them in a digital repository.
Technology Adoption Communication Strategy	Create educational materials (at appropriate grade level) that illustrate the advantages of the HIS over existing practice. Image dominant infographics are often well-received.
Exemplar	Using regression analyses, Magsamen-Conrad, Wang, et al. (2020) found that ICT effort expectancy and performance expectancy significantly predicted nearly 40% of the variance eHealth literacy, when controlling for age, sex, health information-seeking experience, and level of education. Research findings on the predictive power of UTAUT constructs (e.g., performance expectancy) indicate that HIT adoption functions more similarly to organizational contexts in which IT adoption is not experienced as fully voluntary (Magsamen-Conrad et al., 2019).

Magsamen-Conrad et al., 2025

Construct: Effort Expectancy AKA Ease of Use	
Definition	Individuals' perceptions of how hard it will be to use the technology.
Theoretical Derivative	DOI; TAM; TC; UTAUT
Individual-level HIS Application	HIS systems that are perceived as superior to the systems in place (i.e., performance expectancy, see above) cannot result in positive outcomes if practitioners and patients do not feel capable of using the systems themselves because the effort of doing so is overwhelming.
Organizational-level HIS Application	The implementation of HIS extends beyond installation of the technology to include assessment and intervention to foster helpful patient and provider expectancies.
Narrative Example: Patient	Iman's doctor recommends he use the hospital's digital medication tracker on their ePHR system to ensure that he is taking the correct daily dose as a part of his surgery recovery. Iman agrees that it is a good idea but when he opens the tracker, it looks really hard to use and complex. He thinks it will take a lot of time to figure it out. Iman decides not to use it, feeling as if he's more at risk of mixing up his medications if he uses it than if he doesn't.
Narrative Example: Practitioner	Dr. Cassedy has been asked to use the ePHR portal's new system to provide patients with digitally accessible referrals. Dr. Cassedy thinks the system is straightforward and understandable. They think it will be easy to use.
Technology Adoption Communication Strategy	Develop messaging and training videos (at appropriate grade level) underscoring the ease of use, perhaps as compared to previous systems, that help to illustrate the advantages of the HIS over existing practice.
Exemplar	Magsamen-Conrad, Wang, et al. (2020) found that general ICT effort expectancy predicted 29% of the variance in eHealth literacy even when controlling for demographic variables.

Magsamen-Conrad et al., 2025

Privacy and Autonomy Challenges

Unaccounted Factors

Privacy concerns in technology adoption not addressed in dominant theories.

Health Information Exposure

Forced disclosure of sensitive data in healthcare settings.

Disempowerment

Loss of autonomy in health-related decision making due to technology.

Magsamen-Conrad et al., 2025

Challenges and Disadvantages of HIT

1

Digital Divide

Persistent issues with technology access and literacy can exacerbate health disparities.

2

Integration Issues

Many HIT interventions lack integration with existing hospital-based patient education programs.

3

Consistency Requirements

Positive health outcomes often require consistent, long-term use of HIT solutions.

4

Limited Scope

Some interventions target specific behaviors but fail to address broader social determinants of health.

Senteio & Magsamen-Conrad (in press)

The Technological Capital Model of eHealth (TCeH)

The TCeH model emphasizes the role of technology in shaping health outcomes.

Digital Access

Examines the availability and affordability of technology.

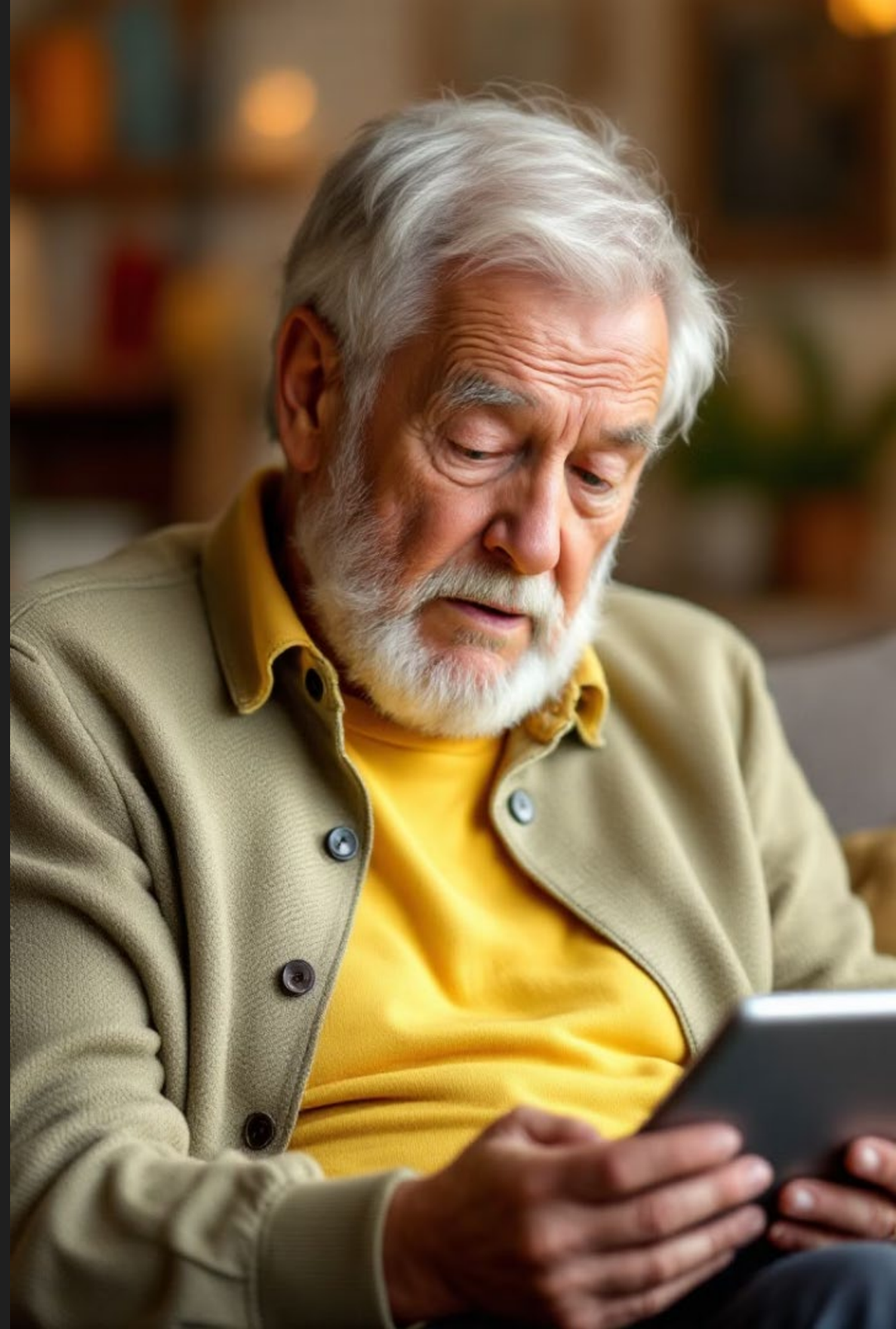
Digital Privilege

Considers the advantages certain groups have in accessing and using technology.

Digital Oppression

Recognizes how technology can be used to marginalize and exclude.

Magsamen-Conrad et al., 2025



A Call for Change

Challenge researchers and practitioners to address digital inequalities.

1

Acknowledge Systemic Barriers

Recognize the role of social structures in shaping technology use.

2

Promote Equitable Access

Ensure that everyone has the opportunity to benefit from technology.

3

Foster Inclusive Practices

Develop technologies and interventions that are accessible and relevant to all.

Magsamen-Conrad et al., 2025

Why do people accept or reject technology?

And why do we care?

1 **Connections to Health**

We can improve health with technology

2 **Effort and Usefulness**

Adoption theories are more alike than they are different

3 **Who gets left behind?**

Consider mounting concerns related to privacy
Check your “digital privilege”

Technology Acceptance Models

Thank you!

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