UPPSALA UNIVERSITET | USER Uppsala Smart Energy Research group

What Motivates EV Drivers to Adopt Smart Home Charging?

A Socio-Psychological Perspective

STandUP Academy 2026

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Uppsala Smart Energy Research Group **(USER)**

An interdisciplinary group studying how consumers and prosumers can help realise smart grids, with a focus on **user behaviour** and **how people and technology interact**.



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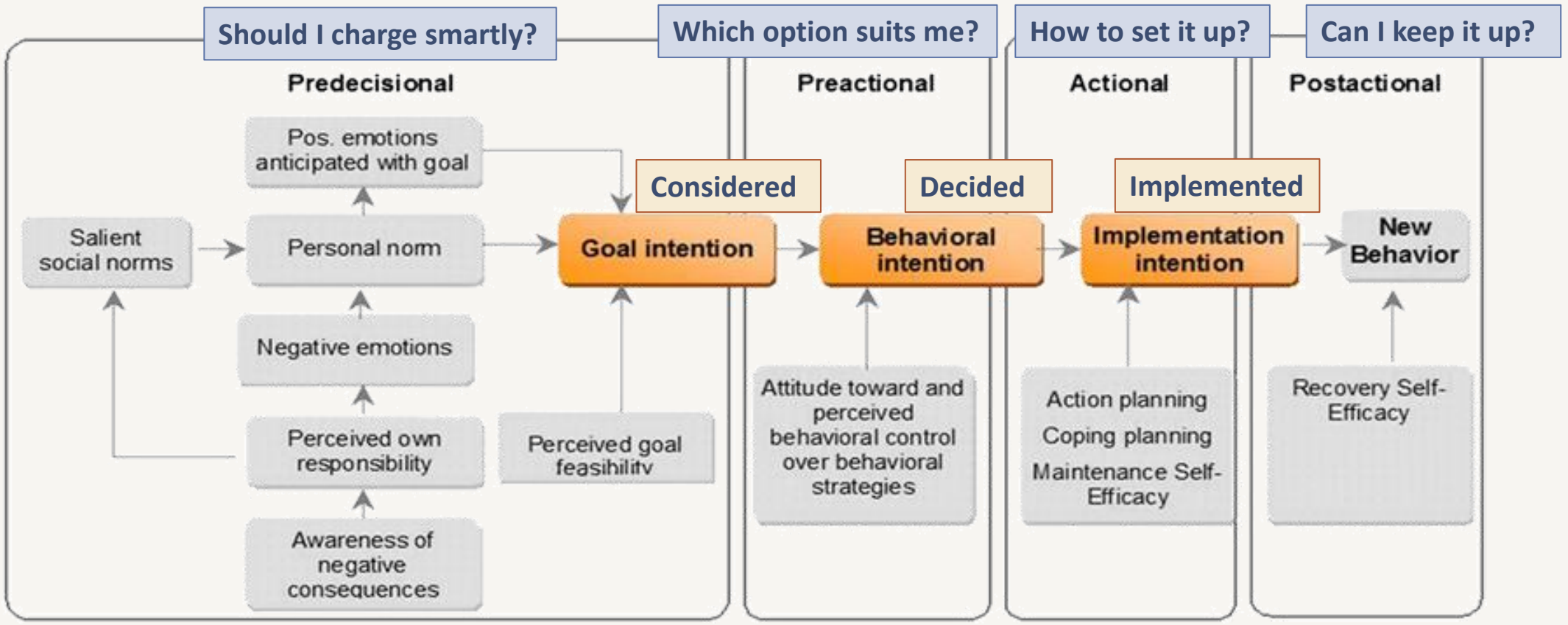
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Presentation: **Smart charging from a user perspective**

We apply a psychological model to understand the factors influencing the adoption of smart charging at home among EV drivers.



The Stage Model of Self-Regulated Behavioural Change (SSBC)



Sample: EV drivers in Sweden (N = 540)
Key model assumption: Each intention has a unique set of predictors.
If supported: Interventions could be matched to each stage.

Research Questions

(1) Which socio-psychological factors predict adoption intentions?

(2) Are predictors unique to each intention? Model testing

(3) Beyond psychology: Which demographic and contextual factors predict adoption?

Contents lists available at ScienceDirect

Transportation Research Part F

journal homepage: www.elsevier.com/locate/trf

The dynamics of purchasing an electric vehicle – A prospective longitudinal study of the decision-making process

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ARTICLE INFO

Article history:
Received 5 August 2013
Received in revised form 14 April 2014
Accepted 14 April 2014

ABSTRACT

This paper presents the results of a longitudinal prospective study whic
ple interested in the purchase of an electric vehicle for a period of two m
adapted stage model of self-regulated behavioral change (Bamberg, 20
questionnaire with a stage diagnostic and the measurement of centra
was administered to the participants every second day. The analysis
transitions between the stages occur along the paths of the stage mode

Contents lists available at ScienceDirect

Renewable Energy Focus

journal homepage: www.elsevier.com/locate/ref

Understanding malaysian homeowners' intention to adopt photovolta systems for EV charging: An integrated theory of planned behaviour a diffusion of innovation approach

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ARTICLE INFO

Keywords:
Co-adoption
Photovoltaic systems
Electric vehicles
Theory of Planned Behaviour
Diffusion of Innovation

ABSTRACT

This study investigates the behavioural and innovation-related factors influe
intention to adopt photovoltaic (PV) systems for electric vehicle (EV) charging.
sustainability, current policies treat PV and EV technologies in isolation, missi
low-carbon solutions. By combining the Theory of Planned Behaviour and Diff
study examines how attitudes, subjective norms, and perceived behavioural co

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Understanding behavioral factors influencing EV smart charging: A mixed-method study of citizens' capabilities, opportunities, and motivations

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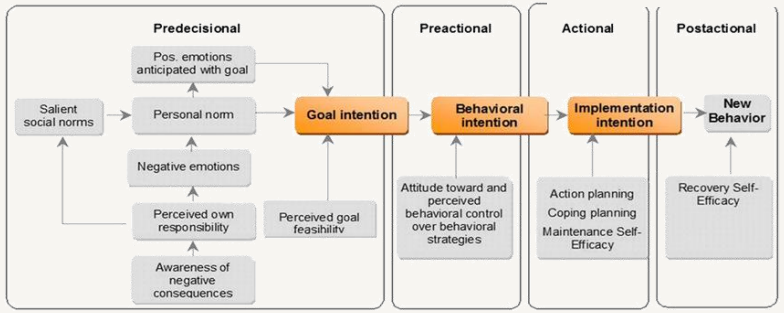
ARTICLE INFO

Keywords:
Electric vehicles (EVs)
Smart charging

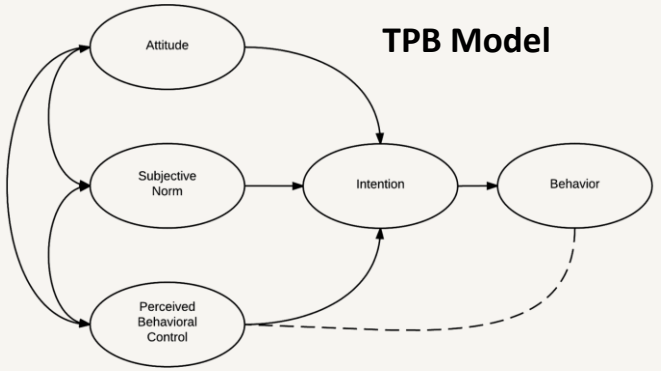
ABSTRACT

Objective: The increasing adoption of EVs presents challenges in balancing ener
charging offers a potential solution. This study examined which factors support

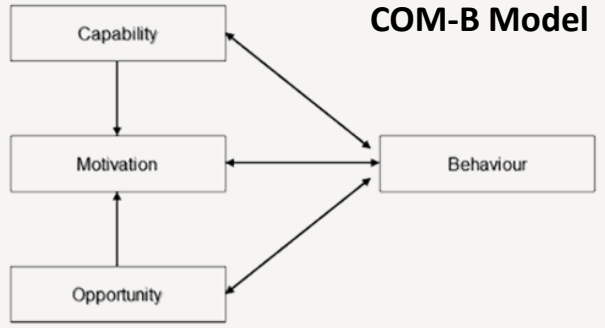
SSBC Model



TPB Model

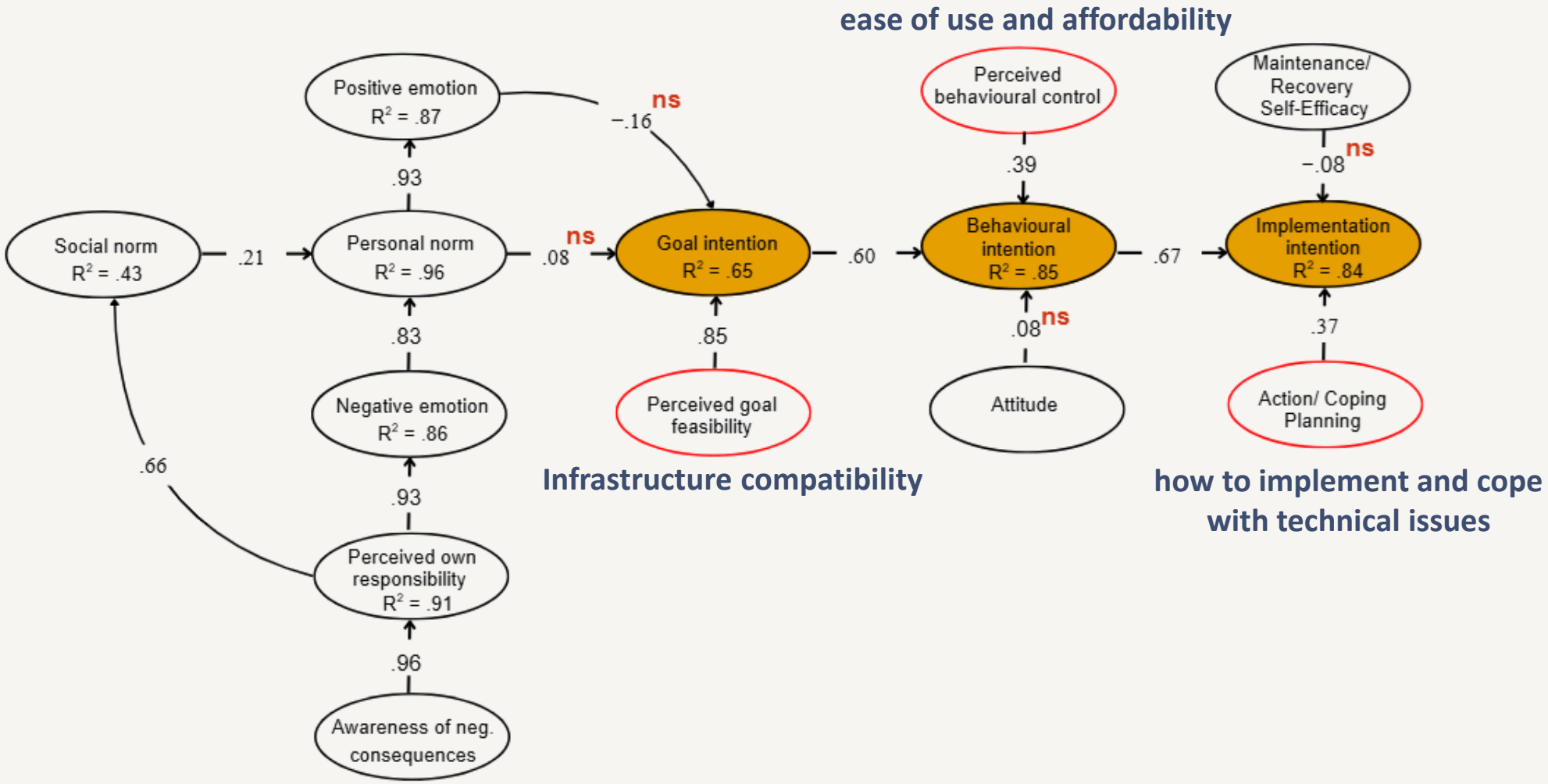


COM-B Model



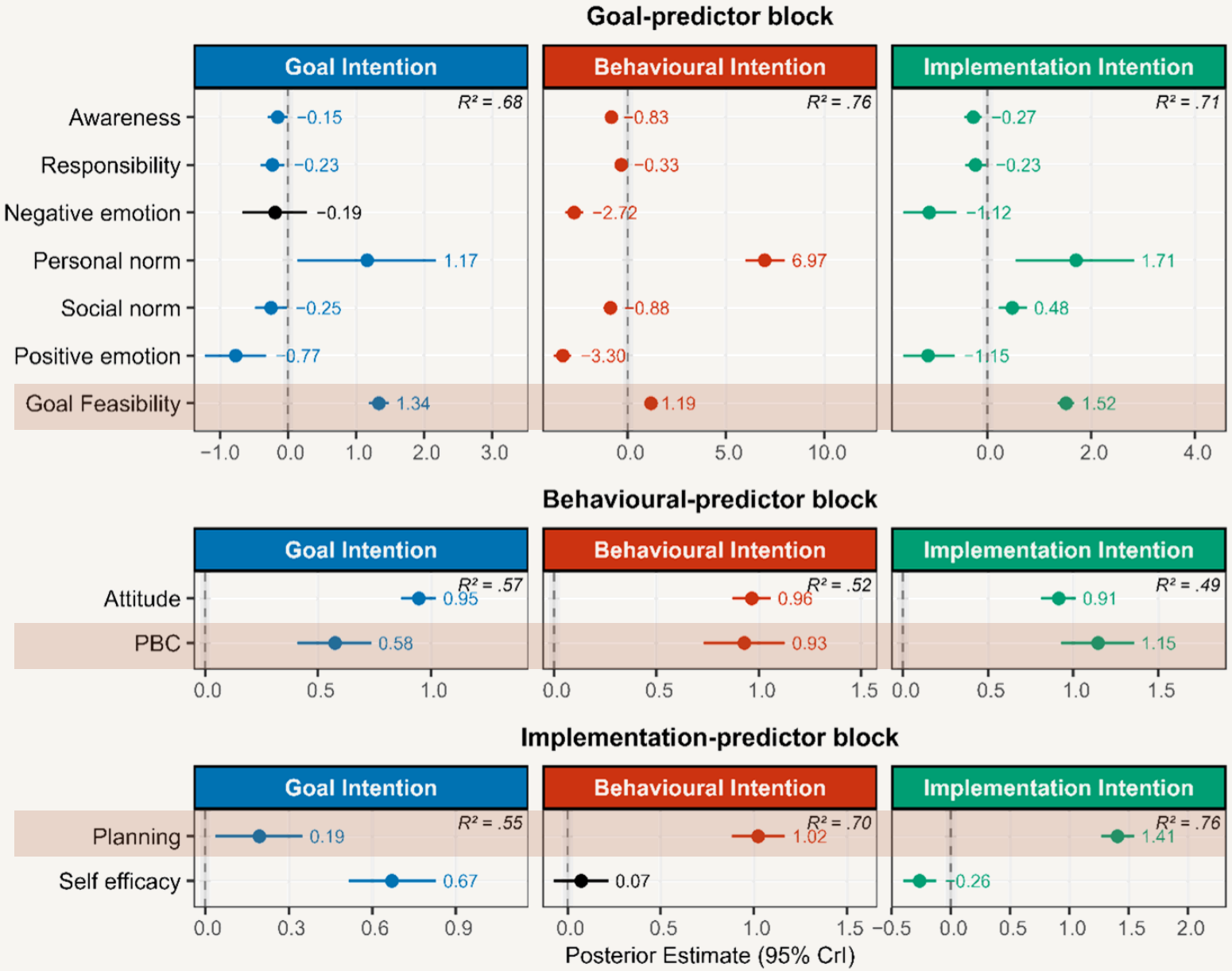
Observation: More and more interdisciplinary studies ground empirical work in established theory.
Promise: Theory-driven research is useful, but only if the theory holds.
Risk: If the underlying theory is flawed, such studies risk reinforcing that flaw.

RQ 1: Which socio-psychological factors predict adoption intentions?



Key findings: EV drivers appear already well-motivated. What predicts intentions to smart charge are practical factors.
Next question: Are predictors unique to each intention?

RQ 2: Are predictors unique to each intention?



Key findings: Largely no. The three key predictors were linked to all three intentions, not just their "own".

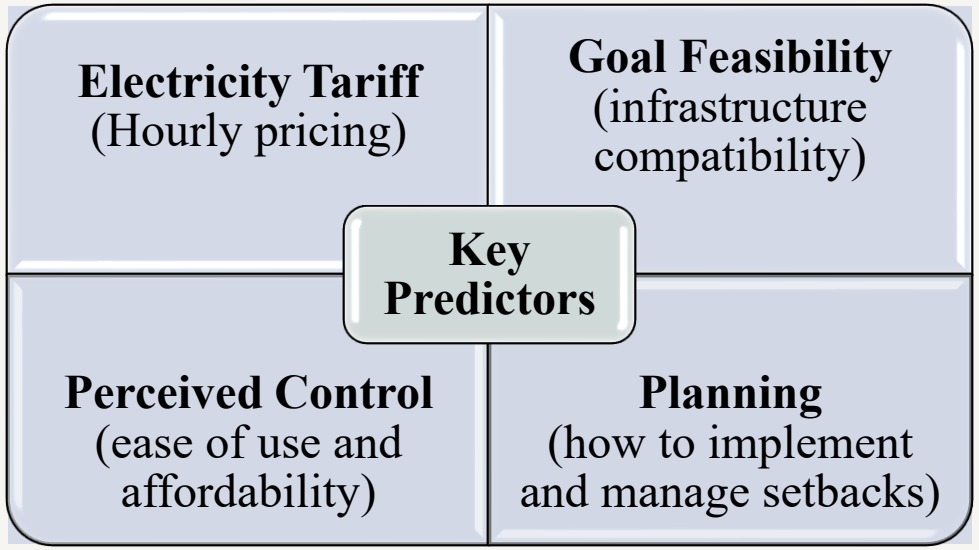
Hence: Promoting the three feasibility-related factors may raise all three intentions, weakening the case for tailoring interventions to each stage of adoption.

RQ 3: Which demographic and contextual factors are linked to more advanced adoption stage?

Evidential Strength	Bayes Factor	Ordinal Logistic Regression
Strong evidence for **association**	> 10	Electricity retail tariffs
Moderate evidence for **association**	3 – 10	–
Weak evidence for **association**	1 – 3	Household size; Access to charging at home
Weak evidence for **no** association	0.33 – 1	Household income; Vehicle Type
Moderate evidence for **no** association	0.1 – 0.33	Gender; Education
Strong evidence for **no** association	< 0.1	Age; Occupation; Urbanity; Housing type; Home ownership; Weekly charging frequency; Monthly vehicle usage; Vehicle ownership; Ownership duration; Access to charging at work

Key finding:

- **Electricity tariff** was the only factor with strong evidence of association.
- Drivers on **hourly pricing** are more likely to be at advanced stage than those on variable and fixed pricing.
- Demographics played a limited role, possibly because EV drivers are already a selective group.

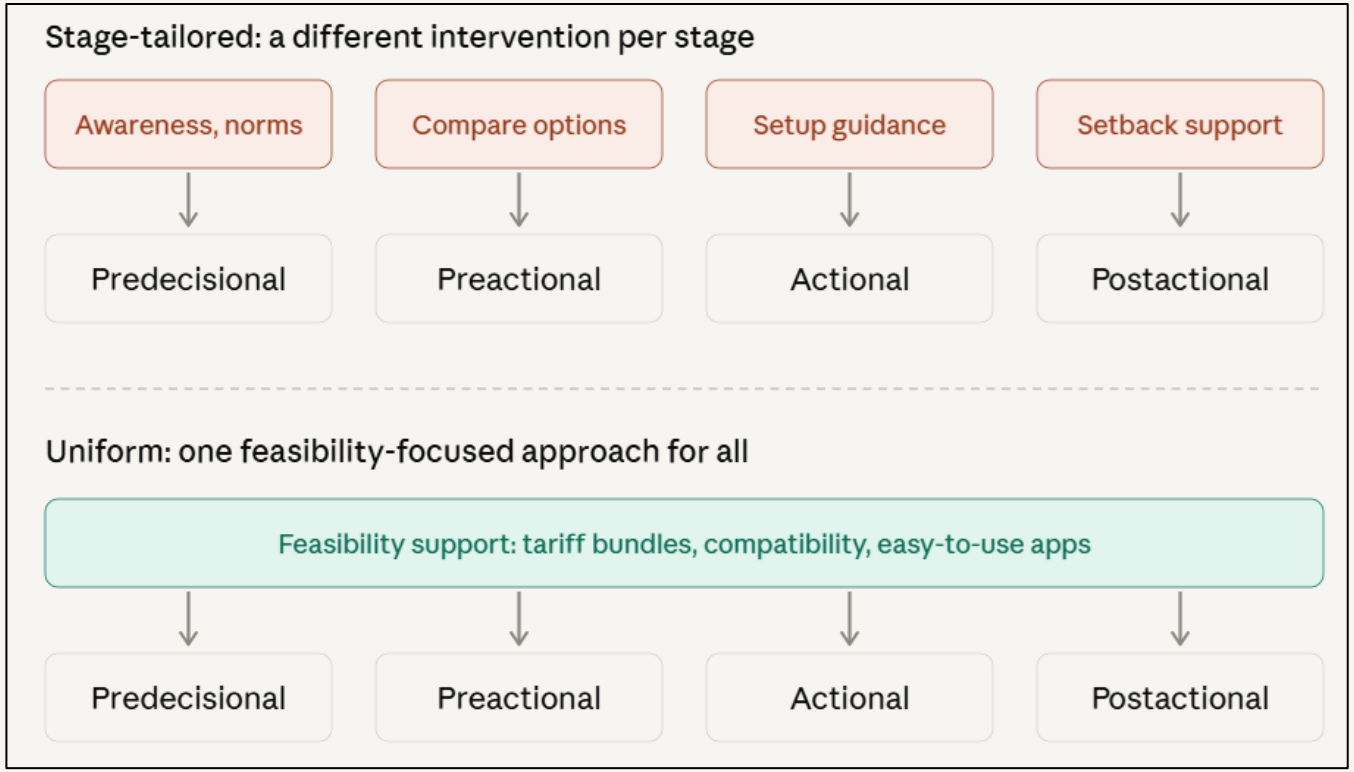


Why theory testing matters

With limited support for the model's assumptions, stage-based interventions risks wasting resources, when a uniform approach may be equally effective.

How to Promote Intentions to Smart Charge at Home?

- Bundle hourly tariffs with smart charging
- Providing aggregator services
- Making smart charging the default
- Offer flexibility payments
- Improving the usability of smart charging apps



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End of Presentation

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