

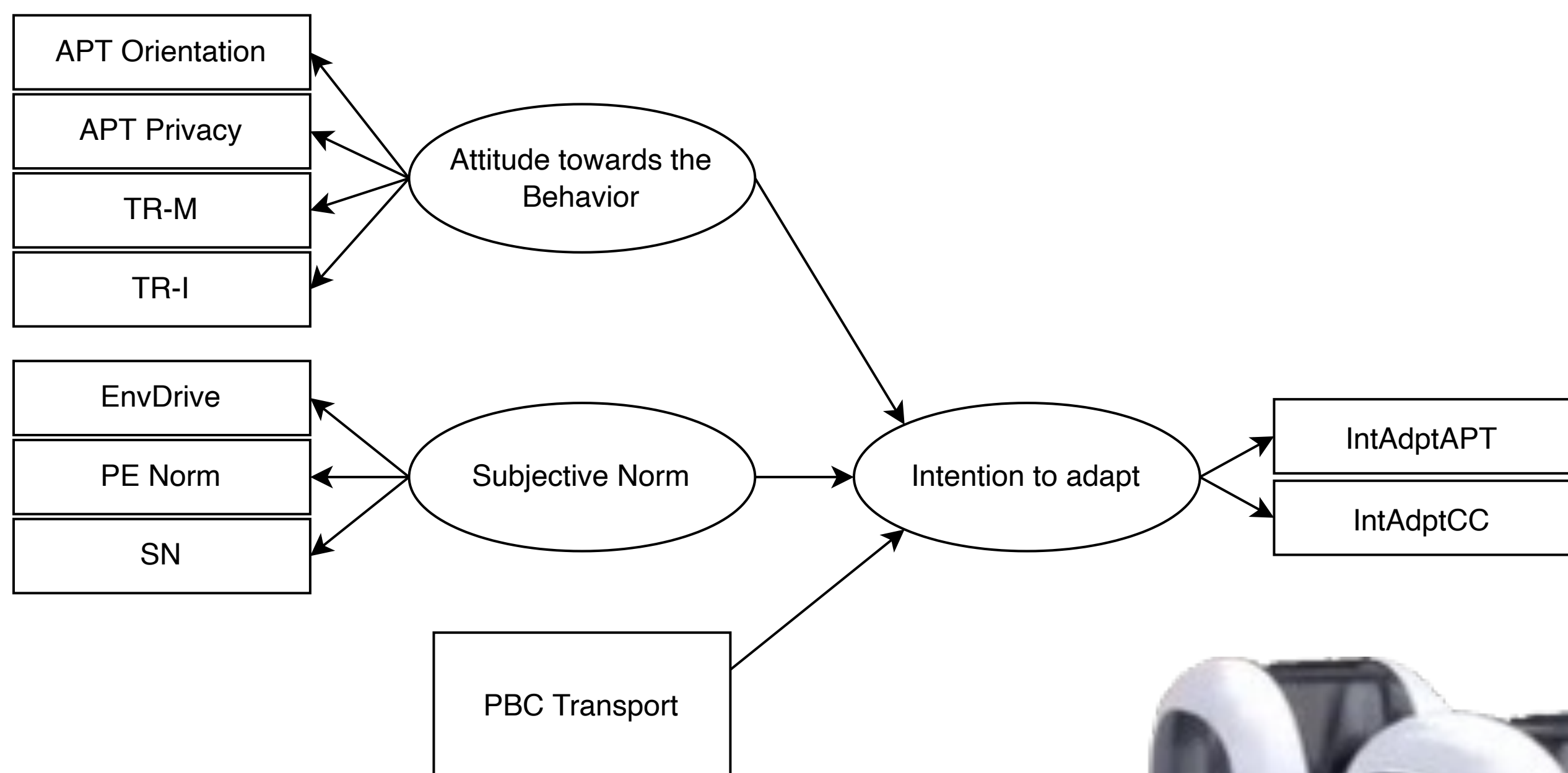
# Rethinking Public Transportation: Understanding Commuters' Intention to Adapt

## Introduction

**Relevance**  
Technical progress in highly automated vehicles inspires researchers and experts to reinvent established public transportation, augmenting the infrastructure with **innovative on-demand solutions** (von Behren et al., 2022). The availability of a new transportation mode in turn could **inspire commuters** to rethink their everyday mobility behavior (Yap et al., 2016). This study therefore explores the **psychological factors** influencing the intention to adapt to on-demand callable highly automated vehicles as a new form of public transportation (automated public transportation, APT).

**Our Study**  
We build on researching the intention to use a technology via the **theory of planned behavior** (e.g., Golbabaee et al., 2020) and enhances this approach by considering APT- and environment-focused constructs. Our study explores **the intention to adapt** rather than the intention to use highly automated vehicles. This dependent variable sets stronger focus on the **behavioral change** that is necessary for a successful implementation of APT.

Figure 1: Theoretically Derived & Pre-registered Structural Equation Model (SEM 1)



**Research Question**  
What is the impact of **psychological factors** related to **technology readiness** and **environmental considerations** on commuters' **intention to adapt** to highly automated on-demand vehicles?



## Method

**Sample**  
  $n = 101$  (41 ♀, 60 ♂)  
 $M = 49.3$  years  
 $SD = 10.2$ ; 27-68 years

- $N = 251$ , data cleanup contained test of basic understanding of new technology (66 failed), 84 participants were excluded for timing, failing the attention check or not recommending the use of their data
- 100 % commuters
- 12.9 % restricted in mobility for health reasons
- 45.5% live in the city, 20.8% in the suburbs, 33.7 % in a rural environment

### Briefing & Consent

**Introduction to Technology**  
via text (80 words) & video (2 minutes)

**Test** for a basic understanding of the new technology (FLAIT)

### Vignette

"Imagine yourself in a future where automated vehicles exist in your city, and you can use the technology on your daily commutes. For example, you regularly use it to cover part of your commute to work."

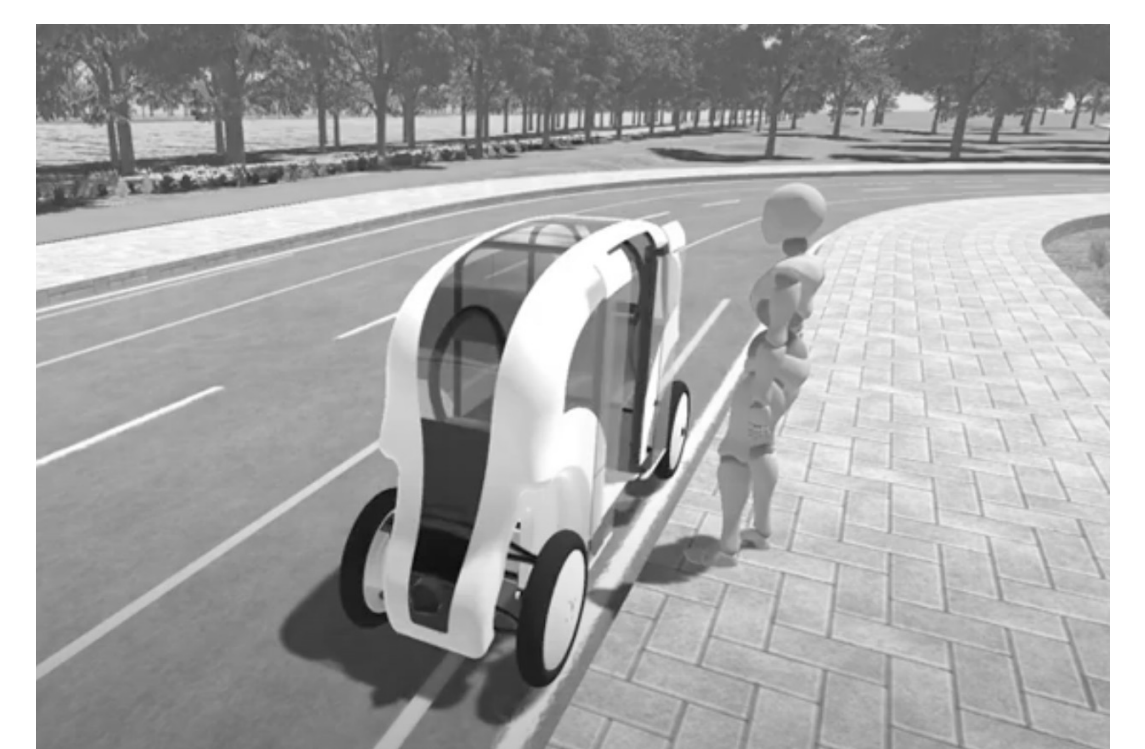
### Questionnaire

- Scales customized and validated via confirmatory factor analysis
- Technology Readiness Index 2.0 by Parasuraman and Colby (2015)
  - PsyVKN by Hunecke et al. (2021)
  - EnvDrive by Kumar & Ghodeswar (2015)
  - IntAdptAPT by Masud et al. (2016)

### Qualitative questions

### Demographics & Debriefing

Watch the **introduction video**  
(Password: FLAIT2023  
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## Results

from SEM 1 to SEM 2

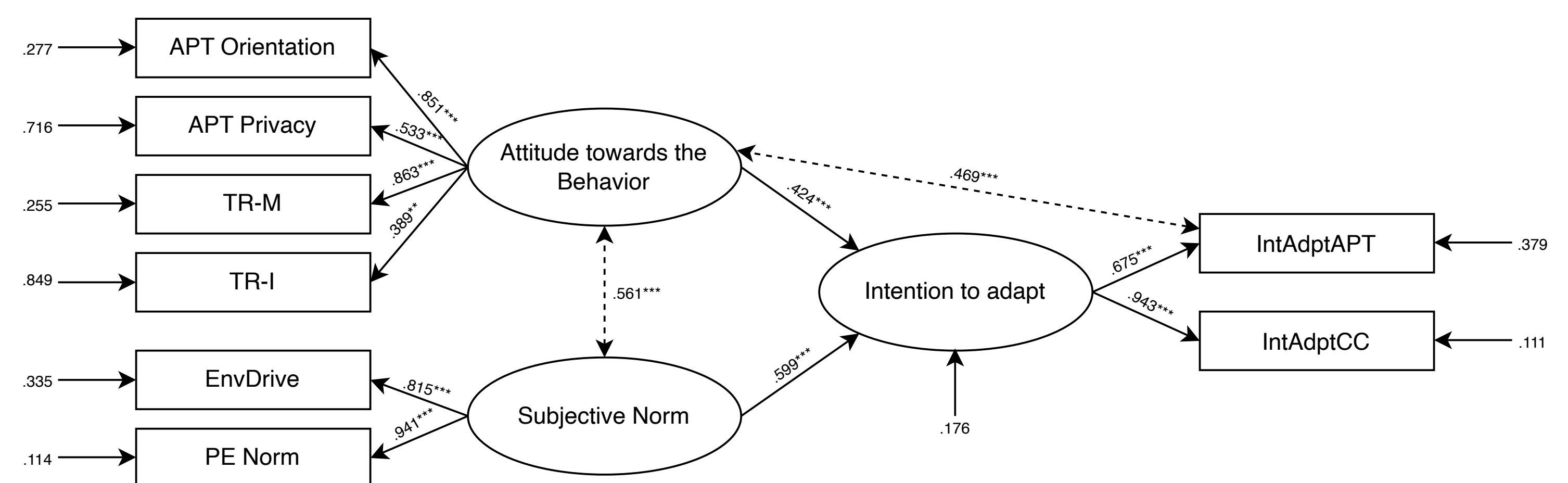
- SEM 1: partially acceptable model fit, but all paths in the model were significant, except the path between PBC Transport and Intention to adapt  
→ **PBC Transport excluded**
- CFAs showed valid operationalization for most constructs, except for SN ( $\alpha = .622$ )  
→ **SN excluded**
- Modification indices (Mplus) advised to admit a covariance between Attitude towards the Behavior and IntAdptAPT  
→ **covariance admitted**

Table 1: Goodness-of-fit of Structural Equation Models

	df	$\chi^2$	df/ $\chi^2$	CFI	RMSEA	SRMR	Conclusion
SEM 1	32	74.025	2.31	0.91	.11	0.148	partially acceptable model fit
SEM 2	16	20.563	1.29	0.99	.05	0.039	excellent model fit

Note. df = degrees of freedom, SRMR = Standardized Root Mean Square Residual, RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index.

Figure 2: Final Structural Equation Model (SEM 2)



Note. Figure shows factor loadings for the latent variables, residual variances, and direct effects with their respective  $\beta$ -weights and level of significance. \*\* $p < .01$ , \*\*\* $p < .001$ . SEM 2 explains 82% of the variance in the Intention to adapt.

## Conclusion

- Within attitude, motivators and inhibitors of technology readiness play a role, as well as a general orientation towards the automated public transportation  
→ **Technology readiness is important!**
- Within subjective norm, environmental drive and personal ecological norm drive the Intention to adapt  
→ **Sustainability is important!**



- Intention to adapt to highly automated on-demand vehicles can be explained by commuters' attitude towards using the technology and their subjective norm  
→ **Insights on why commuters intent to change!**
- structural equation modelling with latent variables offers a valuable approach to the study of technology adoption  
→ **Let's continue TPB research with SEMs!**

