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## MODELING INTERVENTION COMPLIANCE BEHAVIOR: INSIGHTS FROM A CROSS-SECTIONAL SURVEY

LILIAN KOJAN | 2ND NATIONAL CONFERENCE ON INFECTIOUS DISEASE MODELING, 13 – 15 MARCH 2024

# Background: Motivation

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- OptimAgent: Developing an epidemiological **agent-based model of Germany**



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- COVID-19 pandemic saw **strong heterogeneity in compliance** with (non-pharmaceutical) interventions

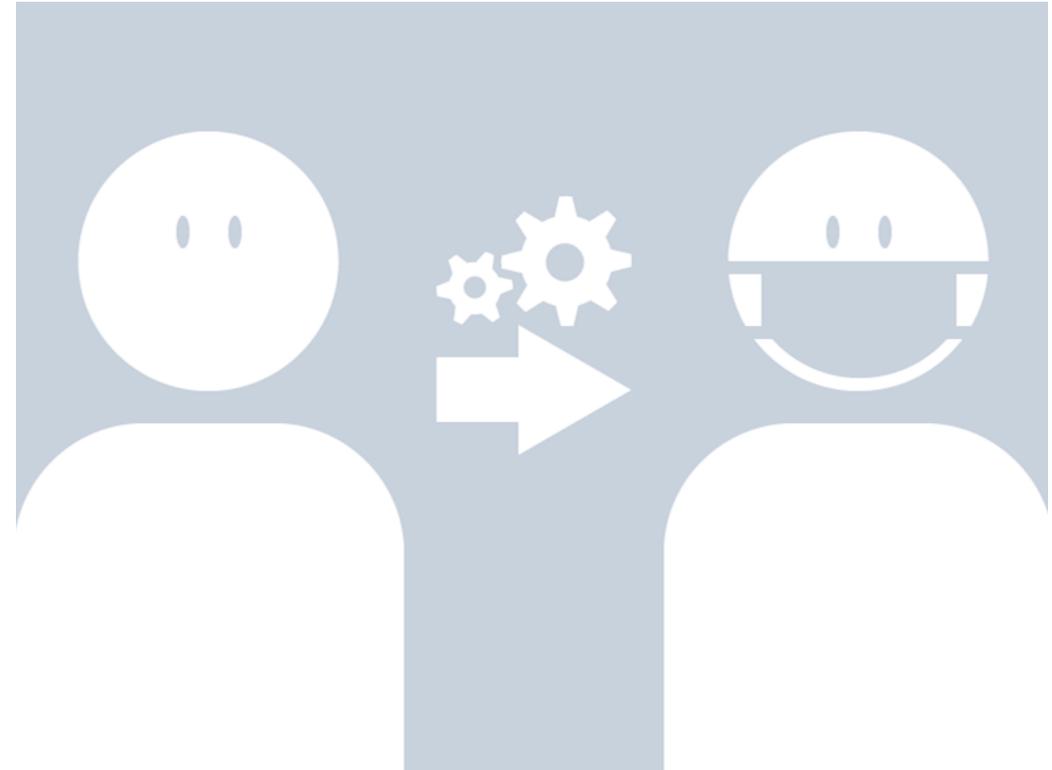


Source: tagesschau.de

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- OptimAgent: Developing an epidemiological agent-based model of Germany
- COVID-19 pandemic saw strong heterogeneity in compliance with (non-pharmaceutical) interventions
- Representing **individual intervention compliance**



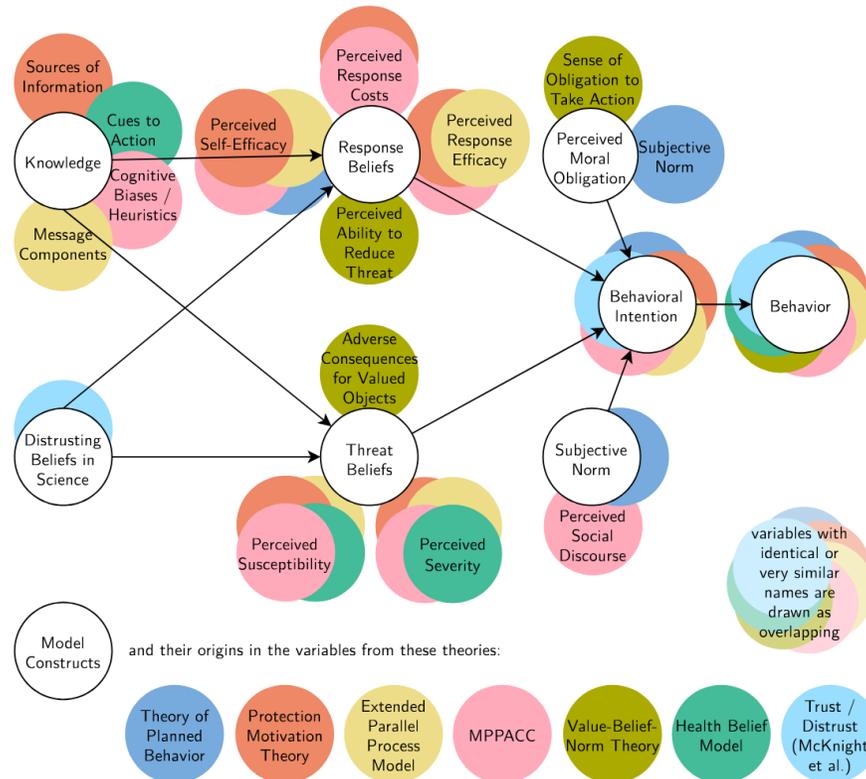
# Background: Motivation

- OptimAgent: Developing an epidemiological agent-based model of Germany
- COVID-19 pandemic saw strong heterogeneity in compliance with (non-pharmaceutical) interventions
- Representing individual intervention compliance
- **Balancing** model parsimony and predictive quality



Source: Vicki Hamilton from Pixabay

# Background: Theory and Evidence



Source: Model integration for COVID-19 protective behavior<sup>6</sup>

- **Many existing theories** of health and social behavior<sup>1-5</sup>
  - Most assume (bounded) rationality
  - Increasingly, focus on role of more „automatic“ and context factors<sup>5</sup>

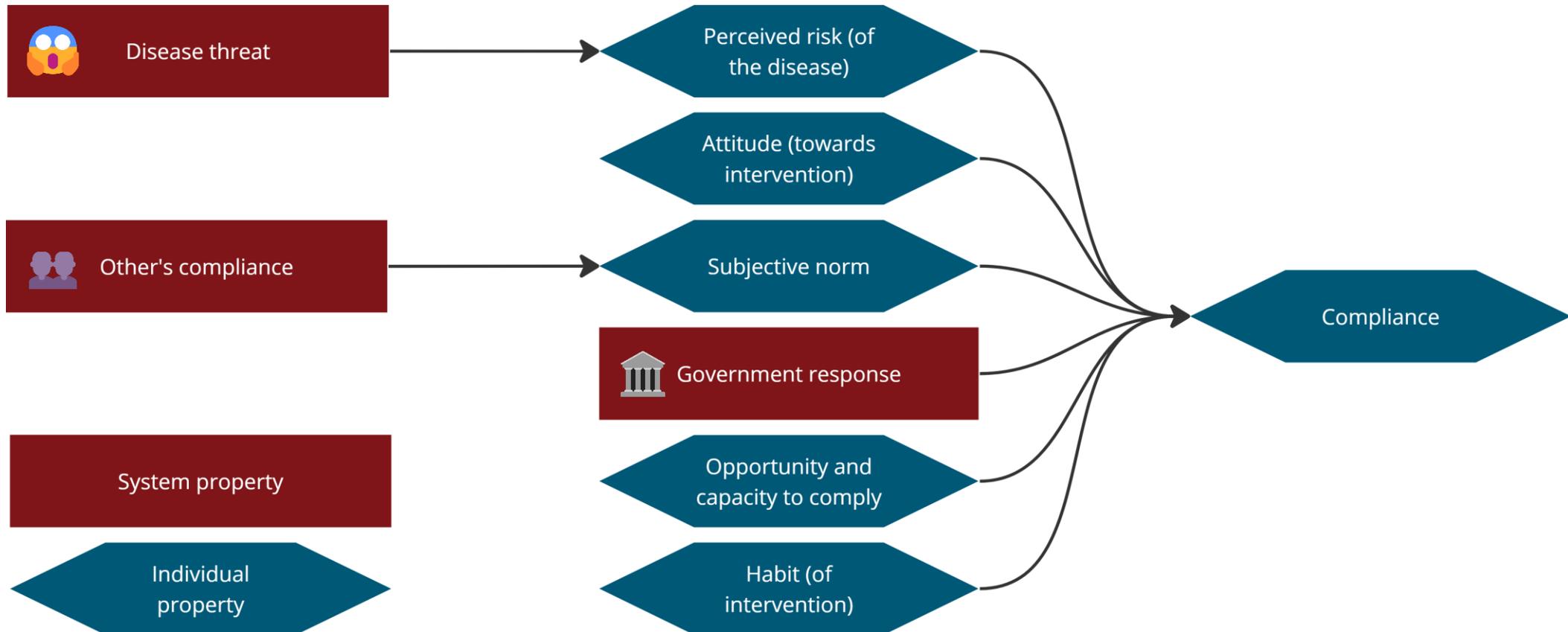
# Background: Theory and Evidence



Source: COHeRe project<sup>10</sup>

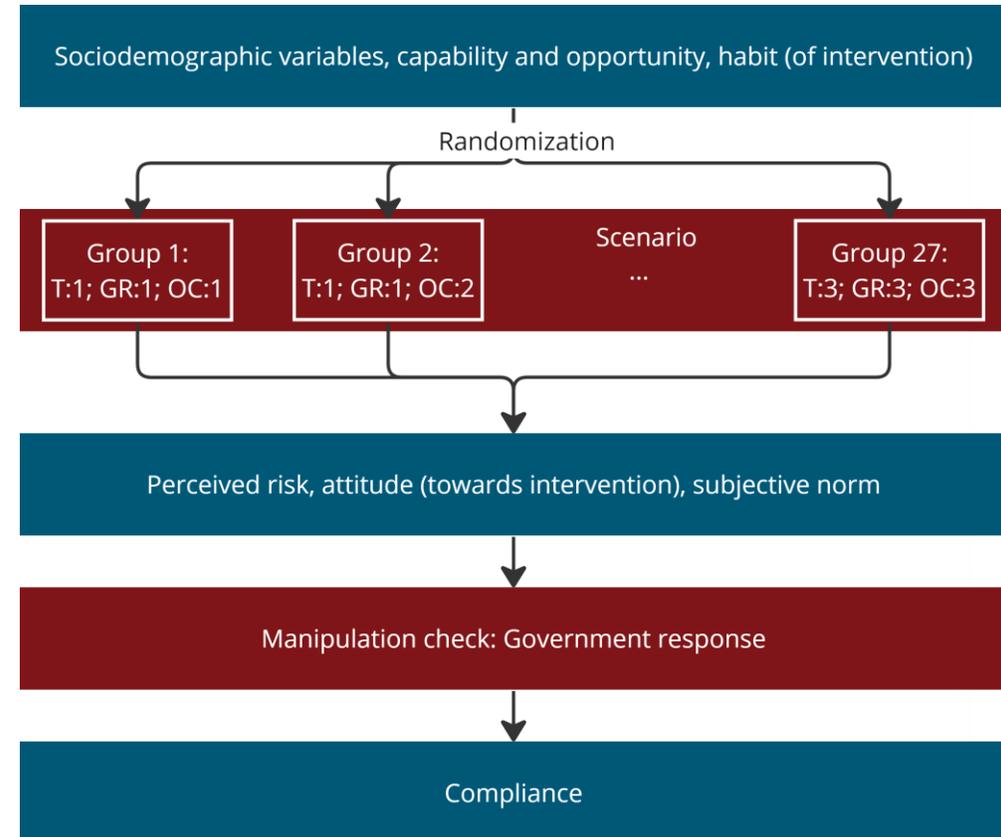
- Many existing theories of health and social behavior<sup>1-5</sup>
  - Most assume (bounded) rationality
  - Increasingly, focus on role of more „automatic“ and context factors<sup>5</sup>
- **Broad range of evidence** on health-related behaviour and its individual correlates from the COVID-19 pandemic<sup>7-10</sup>
  - Findings mostly consistent with existing theories

# Methods: Hypothesized model



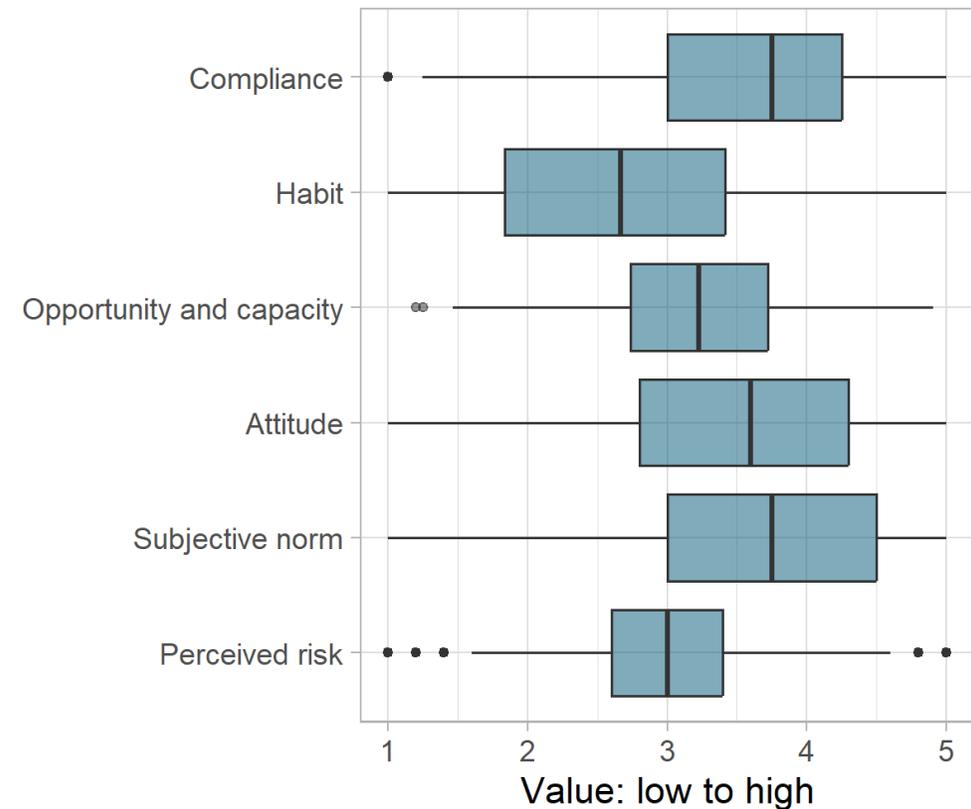
# Methods: Survey

- Cross-sectional survey study
- Scenario: Novel influenza
- 3x3x3 factorial design:
  - 🏛️ Government response: No recommendation, NPI recommendation, NPI mandate
  - 😱 Threat: Low, medium, high local disease incidence
  - 👥 Others' compliance: Low, medium, high
- NPIs: Mask-wearing, social distancing, testing

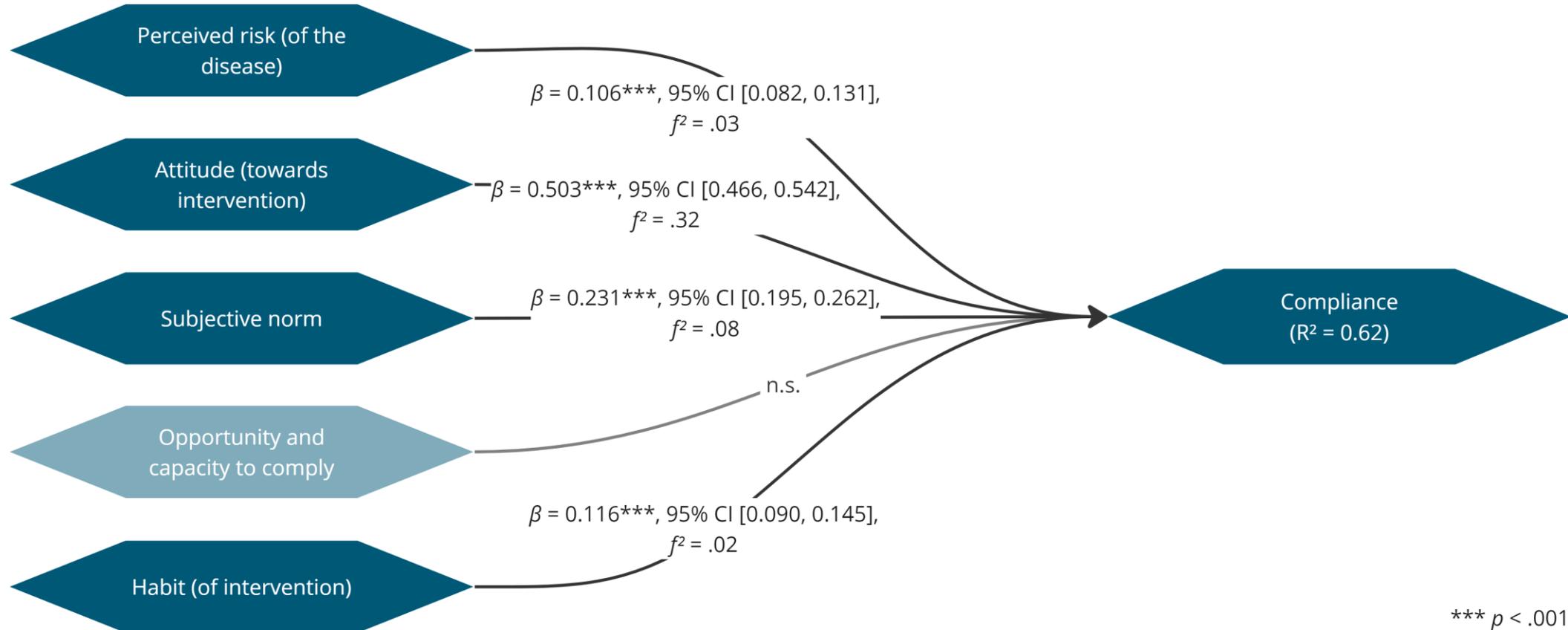


# Results: Descriptive

- Sample: N=3313 German adults, broadly representative for
  - AgexGender
  - Education
  - State
- Manipulation unsuccessful
- Most variables rather high, perceived risk and habit medium to low

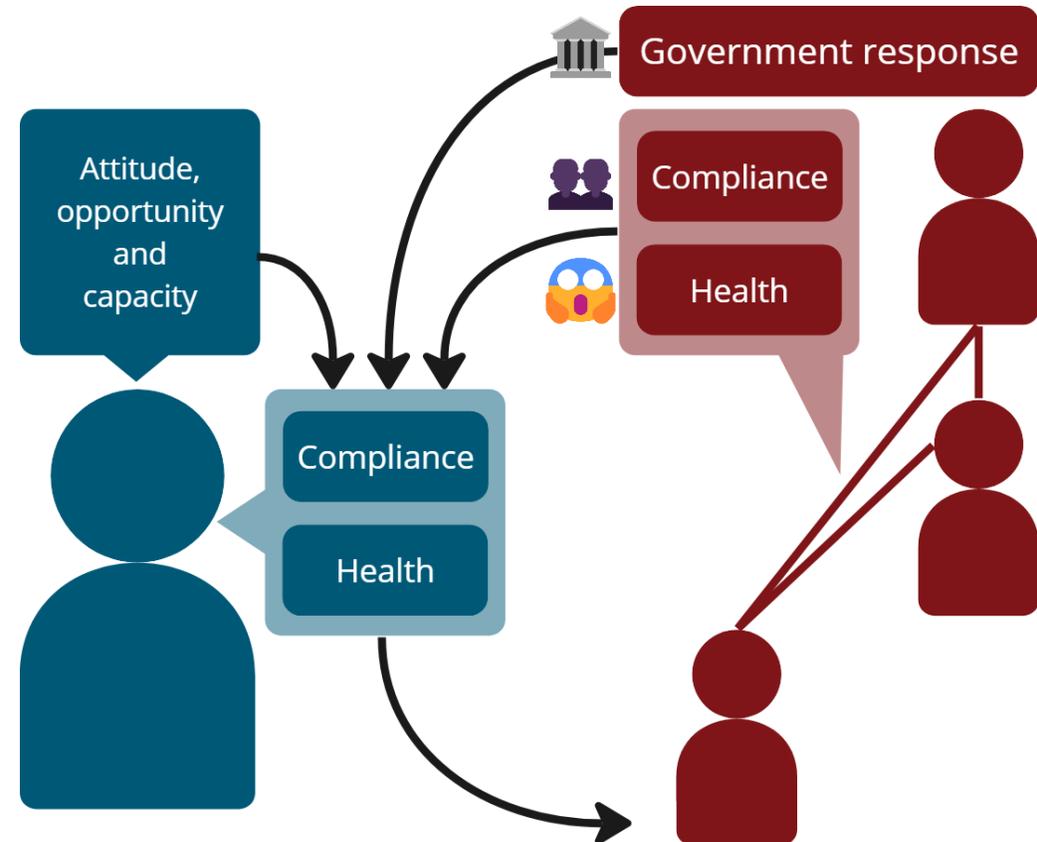


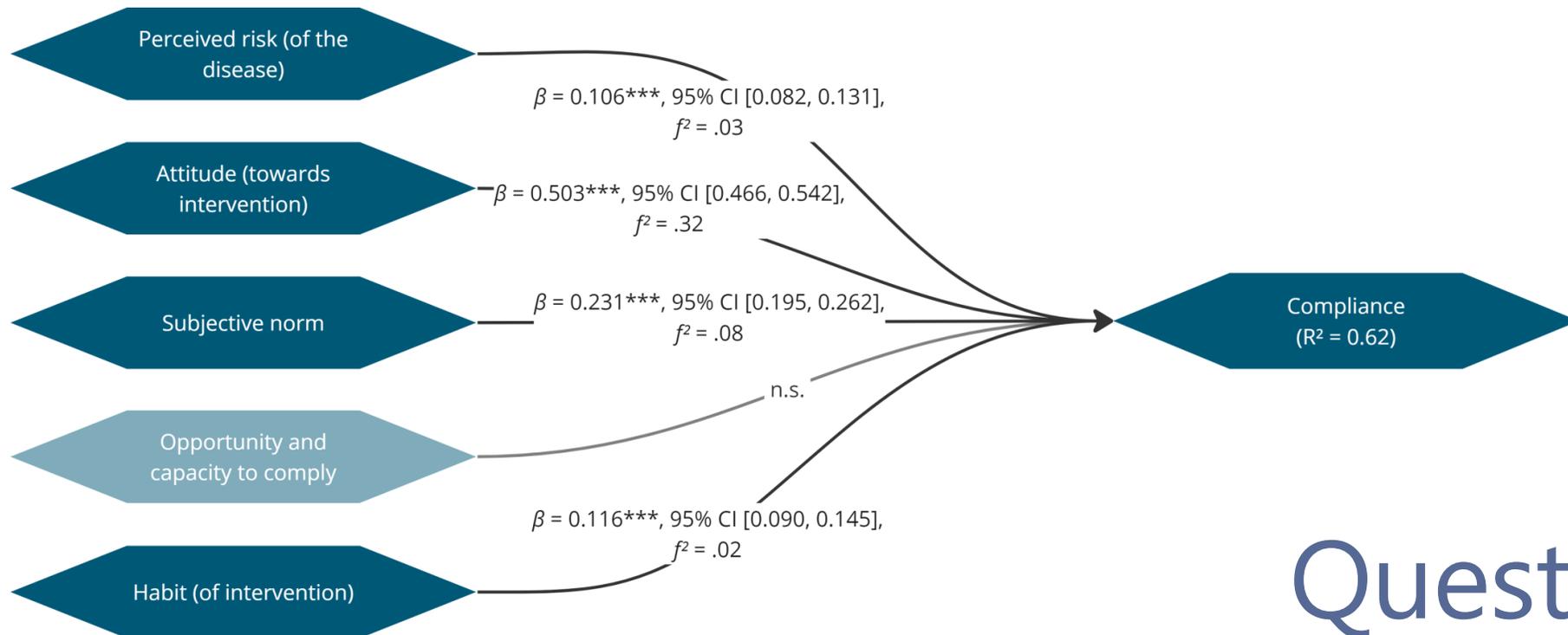
# Results: Model



# Discussion

- Potential avenues for modeling:
  - Attitude and opportunity as constant modifier for compliance probability
  - Threat beliefs and subjective norm updated dynamically from global model
  - Habits updated dynamically based on past agent behavior
- Caution when interpreting results: Cross-sectional self-report data
- Future work:
  - Test model in agent-based simulation
  - Compare with other models of behavior
  - Experimentally validate both model results and assumptions





# Questions?

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# References

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