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Investigation of Illegal Pedestrian Crossings at Crosswalks in the Center of Athens, Greece

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Outline

- **Introduction & Theoretical Framework**: understanding the ‘Pedestrian Dilemma’
- **Methodology**: Experimental design and Stated Preference survey
- **Statistical Modeling**: Binary Logistic Regression and Generalized Linear Models
- **Results & Discussion**: Analyzing behavioral drivers, deterrents and environmental factors
- **Policy Implications**: Infrastructure and management proposals
- **Future Research**: Expanding the behavioral scope

The Theoretical Framework of Pedestrian Behavior

- **Pedestrian** non-compliance is rarely caused by simple negligence; it is influenced by hierarchy factors
- **The main Driver**: Journey time optimization often exceeds the subjective need for safety
- **Influencing factors:**

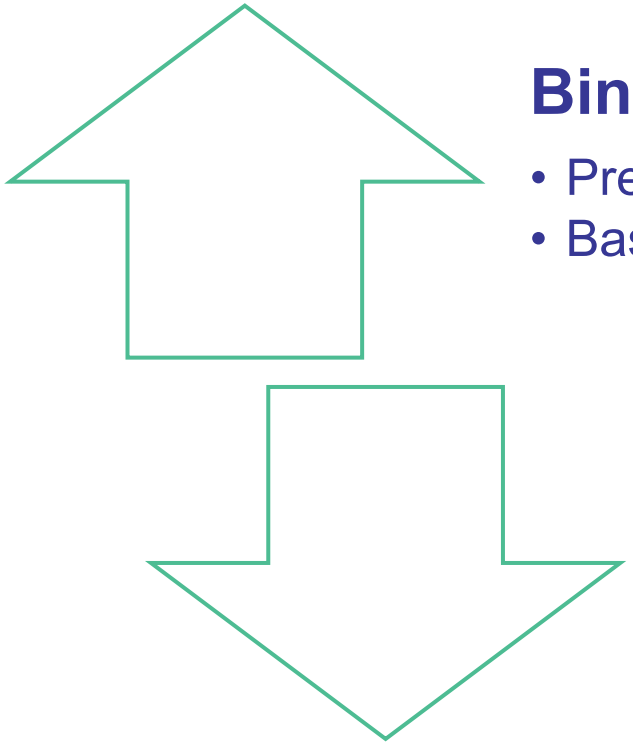
Methodology

Methodology | Stated Preference Survey

- **Survey Design**: A questionnaire comprising four parts, taking 8-10 minutes to complete
- **Experimental Scenarios**: 18 scenarios testing choices between illegal crossing and waiting
- **Key Variables**:
  - **Alternatives: Illegal crossing vs. Compliance**
  - **Parameters: Travel time, crash probability and signaler type (Baseline, Camera, Countdown)**
  - **Sample: 212 valid responses covering a wide range of ages and residency**

Methodology | Statistical Framework

- **Data Processing**: Response were coded and analyzed using Python
- Only statistically significant results were considered
- **Modeling Techniques**:



Binary Logistic Regression

- Predicts probability of illegal crossing
- Based on Yes/ No decisions

Generalized Linear Models

- Capture more complex behavioral relationships
- Allows analysis of trade-offs between variables

Results & Discussion

Results | Behavioral Drivers

- **Time and Efficiency**: Waiting time at signals and the feeling of delay are the primary triggers for illegal crossings. Pedestrians often prioritize cutting down on journey time
- As **delay increases**, probability of violation increases significantly
- Familiarity with the **environment** reduces perceived risk. **Residents** and frequent **visitors** show higher violation rates
- Favorable **conditions,** such as clear weather, short crossing distances and the absence of traffic, encourage illegal crossing

Results | Deterrents and Social Dynamics

- **The Power of Surveillance**: The presence of camera is the strongest **statistically significant deterrent**, increasing the perception of being monitored
- **Social Components**:
  - **Imitation Behavior: Seeing others cross can encourage illegal attempts**
  - **Risk Perception: Previous experience with crashes acts as a protective factor, increasing caution.**

Infrastructure and Environmental Impact

- **Technological Aids**: Countdown timers and traffic control buttons significantly increase pedestrian patience by removing wait-time uncertainty
- **Route Choice Dynamics**:
  - **Pedestrians choosing the shortest route or diagonal crossing show a high propensity for illegality**
  - **Users of protected crossings and signalized routes show much higher compliance**

Policy Implications and Future Research

Strategic Policy Recommendations

- Policy must be '**behavior-aware**', moving beyond traditional signage to proactive engineering
- **Core Proposals**:

Engineering	Management	Enforcement & Awareness
• Safety islands • Better lighting • Countdown indicators	• Implement dynamic green-time calculations	• Install surveillance cameras • Launch targeted safety campaigns

Limitations and Future Research Directions

- **Expanding the Scope**: Future studies should include non-internet users and a larger geographical sample (other cities)
- **Integrative Research**:
  - **Study driver-pedestrian interactions for holistic safety view**
  - **Utilize GIS tools for field mapping of dangerous hotspots with citizen input**
  - **Assess the economic costs of illegal crossings through delays and crashes**

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