The lasting impact of incentives: evidence from a peak avoidance experiment

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Introduction - background

Prevalent issue in transportation: **Congestion**

Ways to deal with this externality:
- Different taxation schemes
- Reward peak avoidance
- Tradable peak permits

Multiple *Spitsmijden* experiments in the Netherlands in recent years
Introduction - aim of this paper

Policy questions:

- To what extent is commuting behaviour affected by the incentive?
- Does it have a lasting impact?

Many claims made in policy reports

Contribution of this paper:

1. Identifying impact of participation on post-experiment behaviour relative to reference
2. Both participants & non-participants
Transportation context:

- Fujii and Kitamura (2003) research effect of one month free bus ticket on habit of driving
- Rose and Marfurt (2007) impact of ride to work event
- Ettema, Knockaert, and Verhoef (2010) suggest peak avoidances not sustained

Other context:

- Swait, Adamowicz, and Bueren (2004) provide an approach to include previous behaviour in choice of fishing site
Location: A12 motorway between Gouda and Zoetermeer (NL)
Timing: November 2008 - December 2009
Participants: close to 5000
Reward: €4 per avoided peak
Data - selection of observations

Requirement: functioning camera’s (reference, reward & post-experiment periods)

Multiple starting moments

141 participants (April 2009 - December 2009)
200 randomly selected other road users

4 weeks of observations during reference period
6 weeks of observations spread over reward period
2 weeks of post-experiment observations (2 months after end)
Habits

Definition of Goodwin (1977):

‘various sources of resistance to a change that on purely economic or rational grounds would be made’

(Relatively) insensitive to changes in levels of attributes once habit is formed

Swait, Adamowicz, and Bueren (2004):
Habit persistence - previous attribute levels
State dependence - previous choices that influence behaviour
Utility function

Discrete choices of 15 min. intervals between 6-10 AM

\[ V_{ijt} = \beta_0 + \beta_1 TT_{jt} + \beta_2 E_{ijt} + \beta_3 L_{ijt} + \beta_4 M_{ijt} + \beta_5 Y_{it-1} + \varepsilon \]

\( TT_{jt} \) = travel time at alternative \( j \) on day \( t \)
\( E_{ijt} \) = early relative to preferred moment
\( L_{ijt} \) = late relative to preferred moment
\( M_{ijt} \) = dummy for reward
\( Y_{it-1} \) = choice of individual \( i \) at day \( t - 1 \)

\( H_0: \beta_5 = 0 \)
\( H_1: \beta_5 > 0 \)
Data patterns

[Bar chart showing data patterns over 60 weeks, with two lines indicating relative to base rate (non-part.) and relative to base rate (part.).]
Data patterns
Data patterns
Data patterns

![Graph showing data patterns with weeks on the x-axis and values on the y-axis, with two bars for peak/non-peak and peak/non-peak (part).]

References
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Next steps:

- Data of other participants, starting at different moments
- Determine possible different reference groups
- Estimation (!)

Take away:

- Important to consider non-participants
- Lasting impact?


