

Using Incentives as Traffic Management Tool: Empirical Results of the 'Peak Avoidance' Experiment



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The Peak Avoidance Experiment

- Rewarding desired behaviours (travelling outside the peak, or using other modes) instead of penalising undesired behaviour

Research questions

- What is the effect of rewarding in the context of repetitive behaviour?
- What is the longer term effect of rewarding?
- Which constraints affect the behavioural responses to reward policies?

Design of the experiment

Location and timing

- A12 motorway between Zoetermeer and The Hague (6000 vehicles in the morning peak).
- 340 commuters between Zoetermeer and The Hague were rewarded during 10 weeks (October-December 2006)

Incentive strategy

- Participants were rewarded if they did not travel by car in the peak period (7.30-9.30), but:
 - travel by car before or after the peak
 - travel by public transport, carpool or bicycle
 - telecommute

Two reward options

- 3 monetary reward options:
 1. 3 euro to avoid the 7h30-9h30 peak hour
 2. 7 euro to avoid the 7h30-9h30 peak hour
 3. as 2, but 3 euro when travelling between 7h30-8h00 or 9h00-9h30
- credits to earn a Smartphone:
 - 60% of peak periods needs to be avoided



Figure 1: Trajectory of Peak Avoidance Experiment

Detection and data

- Car detection with on-board-units
- travel diary to record use of other modes, telecommuting and non-working days
- behavioural data also collected 4 weeks before and 2 weeks after the reward period

Effects of monetary reward

- without reward: 50% travels by car in the peak
- 3 EURO reward: 26% travels by car in the peak (-48%)
- 7 EURO reward or variable reward: 19-20% travels by car in the peak (-60%)
- primary behavioural response: shift to periods before and after peak
- no structural behavioural change following the reward

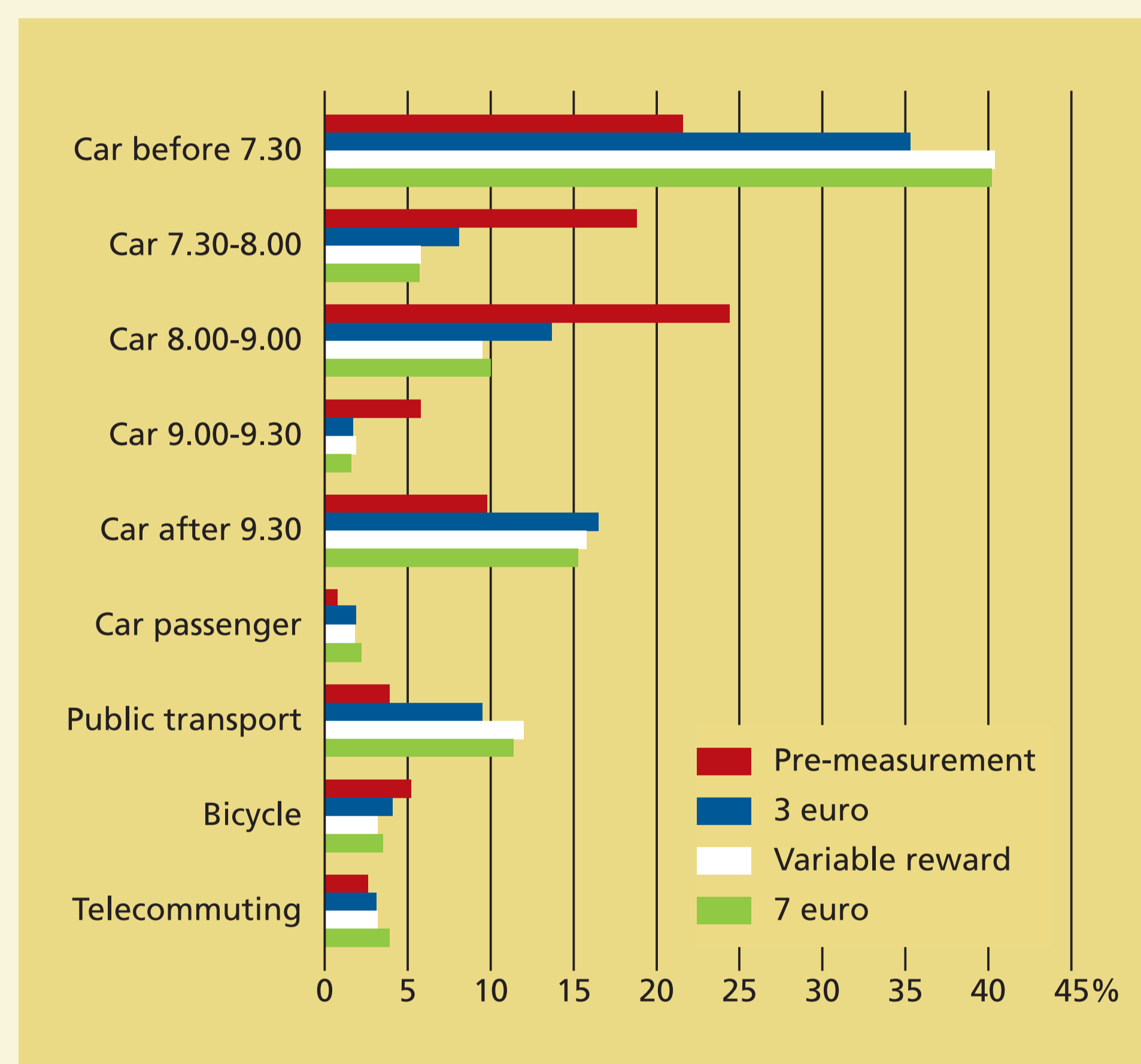


Figure 2: Effects of Monetary Rewards

Smartphone as a reward

- without reward 45% travels by car in the peak
- with Smartphone credits as a reward 15% travels by car in the peak (-66%)
- with only travel information 32% travels by car in the peak (-29%)
- providing travel information has an effect in itself
- primary behavioural response: shift to periods before and after peak
- majority earns 90 to 129% of the necessary credits: no structural behavioural change

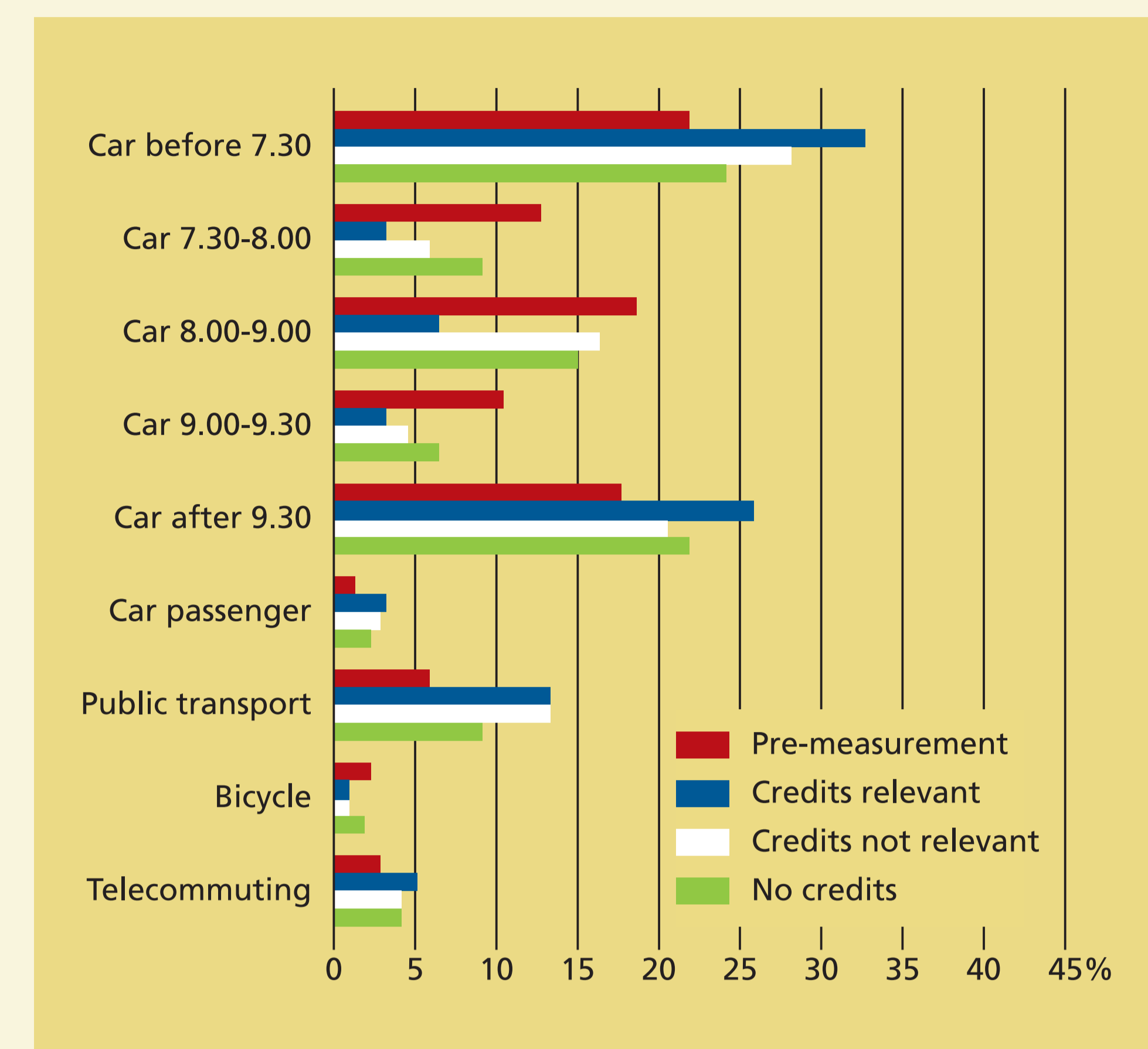


Figure 3: Effects of Smartphone Credits as Reward

Situational effects

- logistic regression models of behavioural responses

Results

- flexible work hours and availability of alternative modes increase behavioural change
- being a single parent prohibits early work start
- high education increases the probability of telecommuting
- users of travel information are more likely to avoid the peak

Conclusions

- using rewards (3-7 EURO or credits for a Smartphone) reduce car use in the peak by more than 50% (but for a self-selected group)
- most car trips are rescheduled to the periods before and after the peak
- when the reward ends, participant return to their original behaviour

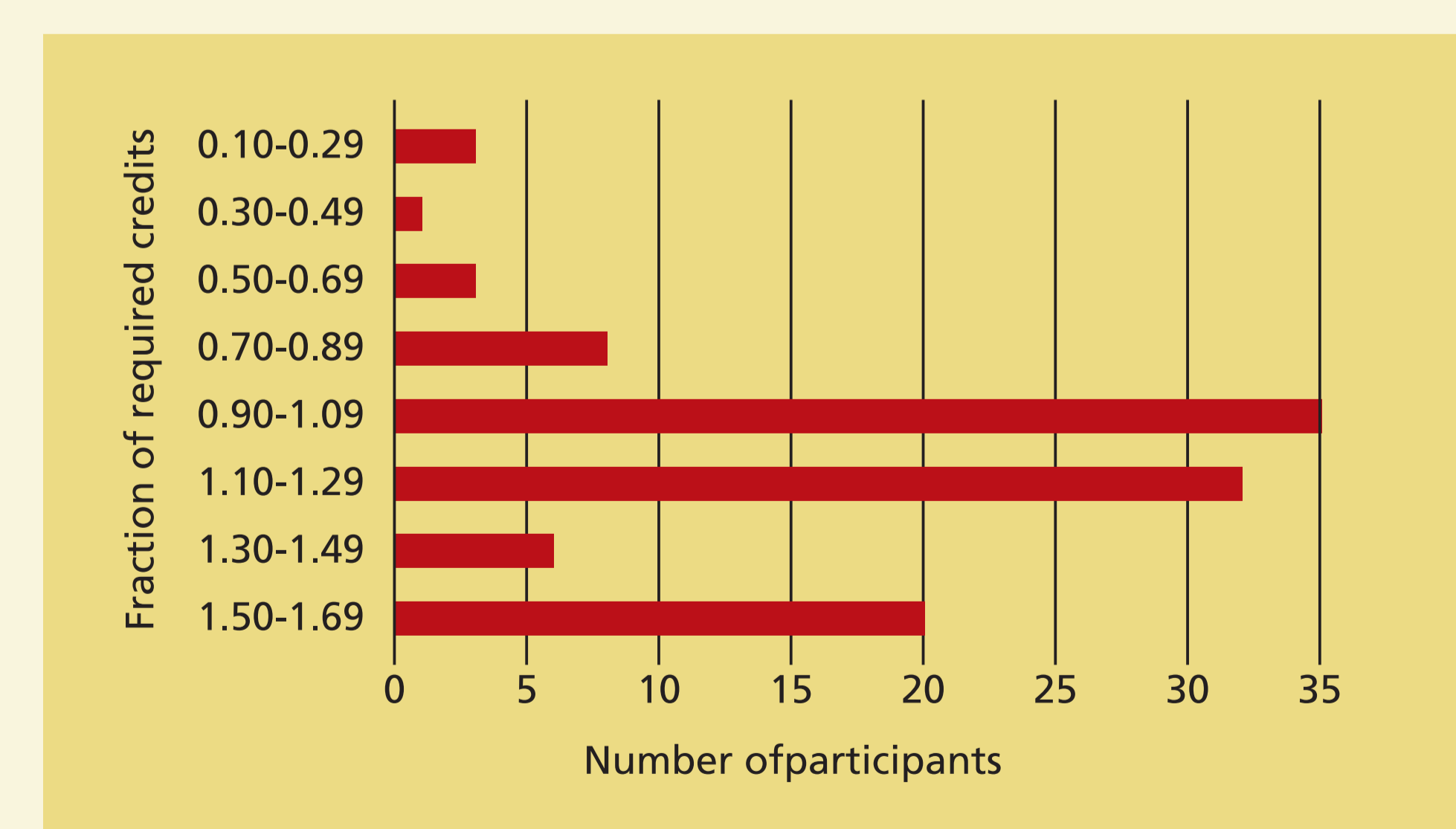


Figure 4: Percentage of Necessary Smartphone Credits Acquired