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NUDGING DOWN THEFT FROM INSECURE VEHICLES. A PILOT STUDY

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Keywords:	Nudge psychology, Theft from motor vehicles, Crime Reduction, Behavioural change, Police				
Abstract:	This report presents the preliminary findings of a pilot study to reduce thefts from cars committed against insecure vehicles, using the behavioural insights or 'nudge' approach. The recipients of the 'nudges' were potential victims of theft from insecure vehicles living in high rate areas, where a bespoke leaflet campaign was developed to nudge vehicle owners to thinking more carefully when leaving their vehicles unattended, particularly when left on their driveways overnight. Although somewhat tentative at this stage, the preliminary findings indicate that the percentage of thefts committed against insecure vehicles in the two treatment areas was reduced significantly when compared with the two control group areas where no nudge interventions were introduced. This demonstrates that if appropriate nudges (grounded in psychological theory) are coupled with and delivered by appropriate messengers, then prosocial behavioural change can be encouraged which can lead to a reduction in criminal behaviour and opportunities for crime.				

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Introduction

The malleability of human behaviour by subtle tweaks burst into public consciousness by its repacking as the 'nudging' of behaviour (Thaler and Sunstein, 2008). The originality of the approach lay not in its content but its representation as a way of shaping behaviour to be more prosocial. The argument was that people should retain the freedom to behave as they wished, but nudged to be more prosocial. In the first example given in the Thaler and Sunstein book, it was shown how schoolchildren could be nudged into choosing healthier food. It would be good if more people were organ donors, made adequate pension plans, and gave blood for transfusion. Recent successes for the approach have included issuing handwritten envelopes in letters demanding payment of tax (the amount of tax recovered increased enormously), moving the reminder that falsely claiming expenses is fraud from the bottom to the top of expense claim forms decreased the expenses claimed, and the **adoption** of an 'opt out' as opposed to an 'opt in' approach improved organ donation.¹

The initial exponents of the nudge approach, Thaler and Sunstein (2008) claim that nudging is not about removing choice in decision making, but rearranging the 'choice architecture' in such a way to promote prosocial options in ways which make their selection more likely. The notion of governments structuring individual choice is bound to be controversial, and has evoked parallels with Orwellian dystopias. It is perhaps least controversial in the context in which it is used in this report; the reduction in the probability of committing crime, namely theft from motor vehicles that have been left insecure. This should be uncontentious because the only group nudged away from the behaviour are motivated offenders and potential victims, and their acquisition or supplementation of a criminal record is injurious to their long-term interests. This is to say nothing of the benefits to someone who would otherwise

¹ http://www.behaviouralinsights.co.uk/publications/page/2/. Accessed 25/03/2016

become a crime victim, and the citizen whose insurance premiums are inflated by commission of the crimes prevented.

In a sister paper currently in development by Roach and Pease, it is argued that nudge is simply an arm of what is widely known as 'Situational Crime Prevention' (Clarke, 1995; 1997) where criminogenic environments are manipulated to reduce opportunities for crime. Sharma and Kilgallon Scott (2015) have argued that there is a subtle but important difference between the Situational Crime Prevention (SCP) and Nudge approaches. While SCP targets a criminal's ability to make rational choices, nudges are based on the principle that most choices that people make are irrational (i.e. not consciously calculated) and hence the choice architecture can be manipulated to influence their behaviour. Nudging being more appropriate for unconscious decision-making, or as Kahneman and Tversky refer to it 'system 1' (e.g. intuition), as opposed to the more conscious and effortful, system two thinking which necessitates rational calculation (Tversky and Kahneman, 1992; Kahneman, 2011). The point being that many of the decisions we make will be intuitive at the system 1 level and so ripe for the subtle influence of nudging. Nudges can of course also be used to provoke us into thinking about the consequences of our decisions before we act. Sharma and Kilgallon Scott (2015) suggest that theft from shops might be reduced if retailers displayed signs showing how savings made from reductions in losses due to shop-theft, would be donated directly to charity.

It suffices to say here that the rebranding of this work as nudging has brought it to Government and public attention and released a set of imaginative people to think of new kinds of nudge. MINDSCAPE is the mnemonic by which the Behavioural Insights Team (formerly of the UK Cabinet Office) categorises behaviour shaping.² The elements are shown in Table 1

INSERT TABLE 1 HERE

² http://www.behaviouralinsights.co.uk/publications/mindspace/. Accessed 26/11/2016.

Acronyms are themselves nudges, being ways of facilitating decision-shaping ways of thinking. There is no shortage of acronyms or practice guides in the nudge literature. MINDSCAPE is a useful one. It suffices here at least, if nudges are thought of as constituting simple and cheap measures which may be put in place and readily tested for their effects on decision-making, in contrast to what can be expensive situational measures such as the installation of close-circuit television. The advantage of keeping it simple, at least in the crime reduction context, would be so as not to deter police and other agencies from taking it too seriously. When anti-crime nudges are cheap to implement, then one can afford to roll out lots of them and see which work in an 'evidence-based' way.

Although the literature on cognitive bias has grown exponentially in recent years with its influence on decision making permeating some professional contexts, such as criminal investigation (e.g. Rossmo, 2008), how such natural biases can be used to do 'good' by 'nudging' people to take more care of their valued possessions, by exciting, for example, the well documented influence of 'loss aversion' in human decision making (Tversky and Kahneman, 1992; Kahneman, 2011) has not. A brief account of attempts to reduce bicycle theft by 'nudging' (although not badged so) are presented next, prior to the outlining of a pilot 'nudge' project to reduce theft from insecure motor vehicles in Durham.

A nudge by any other another name.

Johnson, Sidebottom and Thorpe (2008) categorize existing responses to theft into four groups depending on the crime reduction *mechanism* through which the intervention is expected to work. The crime which they use to exemplify the point is bicycle theft:

- 1. Interventions designed to detect bicycle thieves
- 2. Schemes focusing on the registration of and recovery of bicycles

- 3. Schemes aiming to improve bicycle parking facilities
- 4. Schemes aiming to improve locks and the manner in which they are applied.

The fourth is of greatest relevance here, with 'the manner in which they (locks) are applied' important because it implies that a significant number of thefts might involve inappropriately applied locks – a probable euphemism for 'unlocked' or 'insecure' as with thefts from cars, a problem identified in County Durham. In a follow up study, Sidebottom, Thorpe and Johnson (2009) used targeted publicity in the form of small stickers placed on bikes depicting how to lock a bike securely, to produce a statistically significant reduction in bike thefts in treatment areas.

Although not badged so, there has been several previous crime prevention studies built on the nudge approach. Daniel Nettle and colleagues, for example, explored how signage displaying images of 'watching eyes' **affected** bicycle thefts at three locations on a university campus where levels were previously high (Nettle, Nott and Bateson, 2012). Why is this an example of a crime reductive nudge you might well ask? Put simply, it perceptually increases the salience of surveillance. It does not tell the person who sees it what to do. The findings saw a significant reduction in thefts of bikes in all three experimental (treatment) locations, offset by an equivalent increase in thefts from control (and other locations). The signs were effective but had displaced thefts to the control locations and places on campus without signs (Nettle et al., 2012). The displacement result is almost unique in the literature, making more detailed analysis of the dynamics of the crime (including recovery rates, clustering of thefts etc., suggesting whether the crime was an organised enterprise). Signs throughout the campus are feasible and the campus was geographically separate from the surrounding town, making

it probable that, the entire campus being covered, one would anticipate less complete displacement.

Publicity has long been used to reduce crime (Johnson and Bowers, 2003; Barthe, 2006) with most being victim-orientated campaigns, often targeting potential (future) victims (e.g. Sidebottom, Thorpe and Johnson, 2009; Poyner, 1993). Barthe (2006) identifies the two forms which most victim-oriented publicity take: (1) generic schemes relating to crime and its prevention; or (2) specific schemes aimed at certain groups, with generic schemes found to be far less effective at reducing crime (e.g. Riley and Mayhew, 1980; Johnson and Bowers, 2003; Sidebottom et al, 2009). Johnson and Bowers (2003) suggest that this is explained by the relevance of communication strategies to the target population that the publicity is intended to affect. Barthe's (2006) finding echoes that crime prevention publicity can only be fulfilled if ways are found which effectively reach and engage intended audiences. In regard to theft related crimes such as burglary, for example, UK police have traditionally used a 'lock it or lose it' approach, whereby areas have been targeted with leaflets of the kind INSERT FIGURE 1 HERE presented in Figure 1.

As can be seen, such leaflets and posters at best only convey a generic message to raise residents' awareness of vulnerability and the need for personal vigilance and responsibility for personal security in high burglary areas. The same message is delivered in the same way, irrespective of whom the message is intended to influence. When the first author recently asked an officer from a UK police force if his force still used the same type of leaflets and posters in burglary reduction campaigns, he said that they did. When he was asked next whether there was any evidence to suggest that these leaflets had had the desired effect (i.e.

reduced the number of burglaries) he said, 'No, but we have a warehouse full of them to get rid of'. The central point however is that the leaflets tell people what to do. By contrast, nudges invite subtle reframing of the perception of the situation. Us humans don't like being told what to do.

The purpose for our pilot study was to reduce the percentage of thefts from cars committed against vehicles which are left insecure, by targeting vehicle owners. Our method was simple, to develop more bespoke, better targeted messages, to be delivered by the most appropriate medium for the target audience concerned. In short, we wanted to employ a nudge approach to re-vamp (and target more appropriately) messages to influence people to take more precautions in areas where thefts from insecure vehicles was high. A nudge pilot study to reduce the number of thefts from vehicles left insecure (i.e. unlocked) in County Durham is now presented.

Method

Although the number of recorded thefts from motor vehicles in County Durham has been reduced over the last few years, the proportion committed against insecure vehicles has remained constant. In the past few years, on average over 25% of all thefts from vehicles crimes in County Durham were against (suspected) insecure vehicles, with the figure as high as 70% for some areas. A reduction in the number of insecure vehicles would therefore make a significant contribution to the overall number of thefts from vehicles in the county. A pilot research study adopting the nudge approach was developed to reduce the number of thefts from motor vehicles in County Durham, by concentrating on those areas where the proportion of thefts from vehicles left insecure was found to be highest.

Selecting comparable pilot areas

 It was decided that four areas within County Durham were needed to serve as either 'target' or 'control' areas, in relation to the use of the nudge pilot initiative in Durham. To enable appropriate comparison, the four areas had to be similar in respect of:

- The level of the problem in the area posed by theft from insecure motor vehicles.
- The size of the population (in terms of households or persons).
- The socio- economic demographics of the area.

Data used to facilitate the identification of the four pilot areas included primarily;

- Crimes recorded by Durham Constabulary (as '045/10 Theft from a motor vehicle') that occurred in the 3-year period 01/09/2012 to 31/08/2015.³
- Experian 'Mosaic Public Sector' Group data by post code was used to determine the social make-up of specific areas within County Durham & Darlington (classifying citizens based on information about the respective addresses, using one of 15 groups based on location, demographics, lifestyles and behaviours).
- 3. It was agreed that the most effective local geography would be that of 'Lower Super Output Area' (LSOA), whereby each area contains approximately 1,500 resident persons (ranging from a minimum of 1,000 to a maximum of 3,000) and contains between 400 and 1,200 households⁴.
- 4. In order to map theft from motor vehicle crime data, records not containing XY coordinates (relating to the crime location) were updated manually, either by; matching with the co-ordinates recorded in the corresponding police incident log (from which the theft was then crimed) or where no log existed (e.g. subsequent crime generated

³ Crime data relating to theft from insecure vehicles was isolated using the search terms: insecure, unsecure, not locked, unlocked, Left open (reviewed by an analyst) within the Modus Operandi text of the crime record.
⁴ Northgate XD (Gis system) was used to count both the total theft from motor vehicle and the number of thefts from insecure

⁴ Northgate XD (Gis system) was used to count both the total theft from motor vehicle and the number of thefts from insecure vehicles per Lower Super Output Area, using choropleth analysis.

during investigations) the recorded address (or partial address/description of the location the crime occurred) was used to determine relevant co-ordinates using a Gis computer system.⁵

From this analysis, the resultant theft from insecure motor vehicles crime data was converted into an index by using the simple formula

count of theft from insecure vehicle x 100 LSOA average for this category

The index was then used to identify the LSOA's that had disproportionately high levels of theft from insecure vehicles, compared with the whole of County Durham, as follows

theft from insecure vehicle Index ≥ 300 (3 or more times higher than average)

Those areas where theft from insecure vehicles, as a percentage of all theft from motor vehicle, was higher than would be expected based on the whole of County Durham and Darlington were further highlighted as potential pilot study areas.

theft from insecure vehicle (% all theft from vehicle) > 26.5%

From twenty possible areas identified using the above criteria (including matching for socio-

demographics, four were eventually chosen;

a. Durham (treatment 1)

- b. Chester-le-street (control1)
- c. Wear Valley (treatment 2)
- d. Wear Valley (control 2).

With all four groups chosen and randomly assigned to one of two conditions, an appropriate

'nudge strategy' was developed and is detailed next.

Developing appropriate nudges

⁵ Experian Micromarketer G3 was used to count the number of postcodes within each Lower Super Output Area that were classified as Mosaic Public Sector Group A-O, via data catchment analysis.

As discussed, the treatment and control areas were matched as closely as possible on social economic demographics, and each of the four was identified as a quite affluent, mainly residential area, populated with mainly professional people with families. One recurring reason identified for why previous victims of thefts from vehicles in these areas had left their vehicles insecure, was, 'I had been shopping and forgot to lock the car when I got home'. Most vehicles targeted had been either left insecure on the vehicle owner's driveway or on a road outside or adjacent to their property. Table 2 applies the MINDSCAPE criteria (displayed in Table 1) to nudge vehicle owners in the treatment areas to take more care to ensure their vehicles are left secure (i.e. locked) especially at night.

INSERT TABLE 2 HERE

The leaflets were distributed to residents in the two treatment areas between September and October 2015, and are presented in Figure 2.

A carefully designed leaflet put through a resident's letterbox was considered the most appropriate means of delivering the 'take care to lock your vehicle' message, for two main reasons. First, the demographic of the resident populations for the four areas indicated that the majority of people were 'professional', working people, hopefully more likely to read the leaflet in the first instance, than younger people in other areas of the county. Second, the areas were mainly populated by parents with young families, who would be inclined to read a message from the police when it came through their letterbox to protect their children if not themselves. If the demographic had indicated a younger population of vehicle owners then maybe delivery of the message by electronic communication, such as email or text message, or via social media, such as Twitter and Facebook, may have been more appropriate options. Needless to say, nothing was distributed in the two control areas.

INSERT FIGURE 2 HERE

Results

Table 3 displays all thefts from motor vehicles, number of thefts from insecure vehicles, the insecure index scores, and the percentage of all thefts from motor vehicles that were recorded as being from insecure vehicles, for the four areas selected, for the 3-year period 01/09/2012 to 31/08/2015 (i.e. prior to the distribution of the nudge leaflets).

INSERT TABLE 3 HERE

As can be seen, all four areas (2 treatment and 2 control) have a high percentage of thefts recorded as being against insecure (e.g. unlocked) vehicles (range = 32.2% to 69.2% of all thefts from vehicles). No statistically significant differences were found between the four areas either for the number of thefts from insecure vehicles or with regards the percentage of thefts from vehicles that were considered insecure.

Thefts from motor vehicle data was collected for the four areas, for the four months of the pilot project and is summarised in Table 4.

INSERT TABLE 4 HERE

As can be seen, at the end of the four month pilot period (i.e. 3-4 months after the leaflet drops in the treatment areas) the percentage of thefts from insecure vehicles had reduced in three out of the four areas, only not doing so in Wear Valley (control area 2), contributing to an overall reduction in thefts from vehicles in these three areas. Both treatment areas (Durham and Wear Valley 1) saw a reduction in the percentage of thefts from insecure vehicles for the pilot period to 33% and 25% respectively, a reduction of 9% and 7% in those areas compared with the average percentages for these areas in the previous three years (41.9% and 32.2% respectively). The percentage of insecure thefts from vehicles in control area 1 (Chester-le Street) had also reduced by 18% (60% to 42%) over the pilot period, where the number of thefts from vehicles overall had increased. Possible explanations for this will be offered in the discussion section.

The mean percentage of insecure thefts from vehicles was 50.25% for the control area (with a high standard deviation of 25.94) whereas for the treatment areas it was 12.75% (with a lower standard deviation of 6.95) suggesting that the percentage of thefts from insecure vehicles was not only higher in the control areas, but also varied greater in the control areas, suggesting that the reduction in theft from insecure vehicles in the treatment areas was more likely to have been as a result of the nudge (leaflet intervention) than from other unknown confounding factors. The mean of the two groups was 37.5 (95% confidence interval of this difference ranging from 4.64 to 70.36). An independent t-test was used to calculate the difference in the mean percentages of thefts from insecure vehicles between the treatment and control areas and the difference statistically was found to be significant at the 0.05 level $(t=2.80, df=6, p=0.03)^6$.

⁶ with a standard error of difference = 13.42.

Discussion

The main findings from the pilot study show that both treatment areas showed a reduction in the percentage of thefts from insecure vehicles when compared with the control areas, which is best attributed to the nudge leaflet intervention. The use of a carefully constructed, bespoke, yet cheap, intervention to nudge vehicle owners in the treatment areas to lock their cars at night appears to work, at least in the short-term, supporting previous claims that crime prevention publicity is only effective it is communicated effectively to specific groups of people (Johnson and Bowers, 2003; Barthe, 2006; Sidebottom et al, 2009). Moreover, that nudging only stands a good chance of working when the right message is designed for the right people and is then delivered by the most appropriate means.

Pilot studies of course always come with caveats and limitations. First, there was not a clear distinction in the reduction of the percentage of insecure thefts from cars between the treatment and control areas, as control area 1 (Chester-le-Street) also saw a reduction in the percentage of thefts from insecure vehicles. It however, also saw an increase in the number of thefts from vehicles overall, which the two treatment areas did not, suggesting that there was a likely small displacement effect from insecure to secure thefts from cars in this area that was not found in the treatment areas. There are a number of other possible explanations for why this occurred, for example, more people in control area 1 may have hidden the fact that that they had left their vehicles unlocked, with a knock on effect of reducing the percentage of insecure thefts from cars in that area. Insurance companies are unlikely to pay out compensation in cases where the owner was negligent with regard to vehicle security, which was an important part of the message conveyed by the leaflet. There might also have been a diffusion of benefits effect from a nearby treatment area, whereby residents of control area 1 heard about the nudge leaflets in the treatment areas (Clarke, 1997), although this would have

been expected more in control group 2 (the Wear Valley) due to its close proximity to treatment area 2 (also Wear Valley).

Second, critics may argue that a more robust study design would have seen a traditional, generic leaflet delivered to homes in the control areas and the nudge leaflet delivered to those in the treatment areas, therefore providing a direct comparison of the efficacy of the interventions for nudging vehicle owners to lock their vehicles. This was discounted early on as those both in treatment and control areas had received 'traditional leaflets' in the three years prior to the study, and although the general trend found was that thefts from cars had been steadily reduced, the proportion of thefts from insecure vehicles had remained high in the four areas. The reduction of insecure thefts was the purpose of the pilot study.

Third, we deliberately made the period for the pilot study short (4 months) as we anticipated that any nudging effect was likely to be short-lived, with those vehicle owners changing their vehicle security habits only in the short-term. That said, we do intend to test this hypothesis by revisiting the recorded thefts from vehicles data 12 months after the nudge intervention.

Fourth, in order to increase both the validity and reliability of the findings, the data relating to thefts from motor vehicles (including insecure) needs to be broken down into months if a reliable comparison is to be made between the before and after treatment conditions (i.e. before and after the nudge intervention). This data is vital, for example when determining if the treatment conditions saw a reduction in the percentage of thefts from insecure vehicles only for the month when the leaflets were delivered, or whether the reduction was seen for all four months of the trial.

Fifth, without a follow-up qualitative study to find out from the vehicle owners in the treatment areas whether they 1) saw the leaflet, and 2) they believe that it had an effect on them, we cannot be sure that the reduction in the proportion of insecure thefts from cars was indeed due to the nudge treatment. We suggest that this is a common criticism of much research of this ilk (including Randomised Control Trials) where conclusions of effect are drawn without speaking with the seemingly 'affected'.

To conclude, if this brief pilot study is seen as a 'starter for ten' and regarded as more of a test of approach than a robust crime prevention intervention in its own right, then it lends support to the use of nudging over generic publicity campaigns to influence victims/potential victims thinking and behaviour with regards risk and security, where traditional approaches have not fared well in the past. **Perhaps a main prerequisite for a nudge is that it must be cheap to implement. With our study for example, the only costs incurred were for the printing of 1500 leaflets and police staff time to deliver them. On reflection, it was not imperative that they were delivered by police so perhaps non-police delivery might have been even more cost-effective. That said, if nudging in the pursuit of crime reduction is to work, then it must only be applied when; the people it is meant to influence are properly understood, the message it conveys has been well -constructed, and its intended audience suitably targeted. A garage full of leaflets might seem like crime prevention on the cheap, but surely only if they actually work.**

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Tables

Table 1 – MINDSCAPE (reproduced from Behavioural Insights Team ¹)				
Nudge	Description			
Messenger	We are heavily influenced by who communicates information			
Incentives	Our responses to incentives are shaped by predictable mental shortcuts.			
Norms	We are strongly influenced by what others do			
Defaults	We "go with the flow" of pre-set options			
Salience	Our attention is drawn to what is novel and seems relevant to us			
Commitments	We seek to be consistent with our public promises, and reciprocate acts			
Affect	Our emotional associations can powerfully shape our actions			
Priming	Our acts are often influenced by sub-conscious cues			
Ego	We act in ways that make us feel better about ourselves			

Table 2. The MINDSCAPE reworked to nudge vehicle owners in the treatment areas.

Nudge	Development of the leaflets
Messenger	Leaflets to be delivered by highly visible officers.
Incentives	Loss avoidance to be prominent e.g. insurers will not pay out for owner negligence.
Norms	They don't want to have the only vehicle on the street that is victimised.
Defaults	Locking your vehicle is what they would ordinarily do.
Salience	Increase the relevance of the message by including photos of the streets involved.
Commitments	Feeling that commitment by the police should be reciprocated.
Affect	Reminder that their children's things may be also taken.
Priming	Reinforce that when parking at home remember to lock the car as normal.
Ego	Ensuring your vehicle is locked will make you feel better – it's harder for thieves.

Table 3. Thefts from all motor vehicles and the percentage from insecure motor vehicles for the period 01/09/2012 to 31/08/2015, for the four nudge pilot areas.

LSOA NAME	All TFMV	Insecure TFMV	Insecure Index	% Tot TFMV
Durham TREATMENT	43	18	337	41.9%
Chester-le-Street CONTROL	45	27	506	60.0%
Wear Valley TREATMENT	87	28	524	32.2%
Wear Valley CONTROL	26	18	337	69.2%

¹ http://www.behaviouralinsights.co.uk/about-us/. Accessed 24/11/2016

Table 4. Thefts from all motor vehicles and the percentage from insecure motor vehicles for the period 01/10/2015 to 31/01/2016, for the four nudge pilot areas.

LSOA NAME	All TFMV	Insecure TFMV	Insecure Index	% Tot TFMV
Durham TREATMENT	3	1	36	33.0%
Chester-le-Street CONTROL	19	8	286	42.0%
Wear Valley TREATMENT	16	4	143	25.0%
Wear Valley CONTROL	13	9	321	69.0%

Figures

Figure 1. Two examples of anti-theft leaflets used in the past.





Figure 2. The two leaflets distributed in the treatment areas

