

On the Origins of the Crime Drop: Vehicle Crime and Security in the 1980s

GRAHAM FARRELL and RICK BROWN

Graham Farrell is Professor of International and Comparative Criminal Justice, Centre for Criminal Justice Studies, School of Law, University of Leeds; Rick Brown is Deputy Director (Research), Australian Institute of Criminology, Canberra, Australia

Abstract: The study adds to crime-drop research examining the security hypothesis. It provides evidence that effective security was introduced for some high-risk vehicles from the mid-1980s in England and Wales and causally connects this to a gradual change in the vehicle-related theft rate. Following three decades of exponential increase to 1987, the rate of increase slowed and continued to decelerate to a 1993 peak. Thereafter the rate fell slowly at first then rapidly from 1995. It is concluded that: (i) what became the change in the rate of vehicle-related theft began in the 1980s, which is earlier than typically understood; and (ii) the gradual arc of the theft rate over more than a decade is consistent with new security gradually permeating the vehicle fleet.

Keywords: vehicle-related theft; car theft; crime drop; crime decline; security hypothesis

The term ‘international crime drop’ (Tseloni *et al.* 2010; Knepper 2012; van Dijk, Tseloni and Farrell 2012; Farrell, Tilley and Tseloni 2014; Tonry 2014) denotes the breadth of crime’s decline in recent decades. A broad set of acquisitive crimes fell in England and Wales from 1992 and personal crimes from 1995. Burglary and theft had been falling in the United States from the early 1980s, then car theft and violence from 1991. National victim surveys in France and the Netherlands show crime drops from the mid-1990s, and to the extent that it can be reliably determined, the story is similar across Europe, North America, the antipodes and elsewhere.

Improved vehicle security, particularly electronic immobilisers and central deadlocking, has been causally linked to the decline in vehicle theft in Australia, England and Wales, Germany, the Netherlands and the United States (Bässmann 2011; Brown and Thomas 2003; Brown 2004, 2013; Farrell *et al.* 2011a; Farrell, Tseloni and Tilley 2011b; Fujita and Maxfield 2012; Kriven and Ziersch 2007; Potter and Thomas 2001; van Ours and Vollaard 2015). This evidence supports the security hypothesis which posits that crime fell due to improved security of different types with little

TABLE 1

Data Signatures Consistent with Security having Reduced Vehicle-related Theft

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- The timing and spread of security fits with the trajectory of declines in vehicle-related theft in different countries
 - Different security devices impact differently against different crime types, consistent with their preventive mechanisms
 - Preventive effects are much stronger effects when multiple security devices are in place
 - The average age of stolen vehicles increased over time when crime fell, because new vehicles have better security
 - There were quicker and larger effects on temporary theft (joyriding, transportation) than on permanent theft (for resale or chopping)
 - Offenders' *modus operandi* changed, with door lock forcing declining disproportionately, consistent with better quality deadlocks.
 - Vehicle theft fell somewhat more quickly among higher income groups, consistent with the more rapid replacement of older insecure vehicles
 - The rate of attempted theft fell later than completed theft, consistent with offenders trying again before quitting in the face of improved security
 - There was a disproportionate decline in adolescent crime, consistent with novices being more easily deterred by improved security
 - In Australia and Canada, car theft fell earlier in regions that introduced electronic immobilisers earlier, then fell nationally in line with their broader spread
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or no resulting crime displacement (Farrell *et al.* 2011a; Farrell, Tilley and Tseloni 2014). The only study we know of, to date, that asked offenders why crime had declined, found security to be their most popular explanation (Brown 2015).

While vehicle-related theft is the present focus, the research on that crime type is given indirect support by mounting evidence that improvements to household security devices – particularly improved window and door locks and fittings plus security lighting – caused the decline in household burglary in England and Wales. *Tables 1* and *2* summarise the analytic data signatures that have been identified in security hypothesis research to date on vehicle theft and household burglary in studies cited above, plus those of Grove, Tseloni and Tilley (2012), Farrell (2015), Tilley, Tseloni and Farrell (2011), Tilley, Farrell and Clarke (2015a), and Tilley *et al.* (2015b).

Most other explanations for why crime declined have largely fallen by the wayside. The review by Farrell, Tilley and Tseloni (2014) finds that 16 hypotheses present in the academic literature cannot be considered viable. The more prominent among them were the suggestions that crime fell due to aspects of policing, imprisonment, abortion legalisation, childhood lead poisoning, or demographic change. Many of the early hypotheses such as abortion (plus gun control, the death penalty, immigration) were only ever really applicable to the United States, and as well as being largely discounted there, they are parochial in the international context. Most others are inconsistent over a range of other evidence (Farrell 2013). For instance, the data signatures listed in *Tables 1* and *2* appear irreconcilable with all except the security hypothesis (Farrell, Tilley and Tseloni in press).

TABLE 2

Data Signatures Consistent with Security having Reduced Domestic Burglary

- A steep decline in households *without* security coincided with burglary's decline
 - Variation in the effectiveness of different security devices are consistent with their preventive mechanisms
 - Preventive effects are much stronger effects when multiple security devices are in place
 - The drop was mainly a decline in forced entry through doors and windows, consistent with improved security
 - Unforced entries – push-pasts, keys used, deception – increased when forced entries (and all burglary) decreased, consistent with partial short-term displacement as a result of effective security
 - Door-forcing at the rear of properties fell first and fastest, consistent with security at the previously most vulnerable entry point
 - There was a disproportionate decline in adolescent crime, consistent with novices being more easily deterred by improved security
 - The rate of attempted burglary fell later than completed burglary, consistent with offenders trying again before quitting in the face of improved security
 - Burglary fell slightly faster among more affluent households, consistent with more rapid upgrading
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There remains much research to be undertaken relating to the security hypothesis. In particular there is a need to more fully explain declines in violence. Both direct and indirect ways in which security reduced violence have been hypothesised and preliminary evidence and argument mustered (see, for example, Farrell, Laycock and Tilley 2015). The present study, however, offers a refinement to the understanding of the relationship between the timing and spread of improved vehicle security and its effect upon vehicle-related theft.

The problem addressed herein is as follows. Previous research assumed that improved security was introduced around the time of the 1993 peak in vehicle theft and thereby caused the subsequent decline in theft rates. However, there is a discrepancy between this assumption and theory. In theory, it would not be expected that improved security on new vehicles would have a widespread immediate impact. New vehicles on the road are, each year, only a small proportion of total vehicles. Laycock (2004) estimated that: '[i]n England and Wales it takes about ten years for the majority of the fleet to be replaced with new vehicles' (p.37). This means that if improved security was introduced only to new vehicles in 1993, its main impact would not be observed until several years later.

The present study first offers evidence that improved vehicle security was introduced in England and Wales in the mid-1980s. It then examines the trend in vehicle theft to show that a gradual and prolonged change occurred from the 1980s that is consistent with the theory of how security would spread through the vehicle fleet.

Vehicle Security in the 1980s

In 1985, then Minister of State for the Home Office, Giles Shaw, observed that:

It is encouraging that a number of British manufacturers are already beginning to respond by introducing for example high security locks on car doors and steering columns. (Shaw 1985, p.iii)

This statement was part of the Foreword to Southall and Ekblom's (1985) landmark study of designing out vehicle crime. Its significance here is that it formally documents that manufacturers were already introducing improved vehicle security by 1985. Its identification of specifically *British* manufacturers implies that they were ahead of those elsewhere, which fits with vehicle-related crime rates falling earlier in the UK than in some other European countries.

Vehicle security was far from a new idea of course. Perry (1910) notes a range of after-market security devices to prevent vehicle theft. Keys and licence plates are now so seemingly mundane that their origin as security devices is easy to overlook (see Newman (2004) for a history). In England and Wales there was pressure upon car manufacturers from the Home Office from at least the 1960s, with steering column locks negotiated for all new vehicles from January 1971 (Mayhew *et al.* 1976, p.9). This was influenced by how 'in the German Federal Republic the requirement that *all* cars on the road be fitted with steering column locks produced a substantial reduction in theft of vehicles' (Mayhew 1979, p.26, italics in original). Many subsequent security developments were anticipated by Ekblom's (1979) prescient notions of a crime-free car, while insurance-based incentives that are now routine were still comparatively rare (Pease 1979).

Although security was beginning to be introduced from the mid-1980s, by the start of the 1990s there were still many vehicle models that were easy to enter and steal. One Home Office study, in which adolescent car thieves were interviewed, concluded that:

The tool that was usually carried was a screwdriver, which was used to open a car door by inserting it into the car lock and twisting . . . 'Quicker than a key' according to one of the offenders, aged 17 . . . Fords and Vauxhalls were most popular because they were 'easier to get into and get away' . . . All stated that they were not just after any car, but sporty fast cars. (Spencer 1992, p.15)

While a more extensive study concluded that for many models:

Vehicle security is seen as lamentably weak, offenders having little or no trouble in overcoming door and ignition locks. (Light, Nee and Ingham 1993, p.53)

In the early 1990s when those interviews were conducted, the rate of vehicle-related theft was at its peak. Signs that vehicle-related theft was abating in the way we suggest below were largely unrecognised, while the possibility that it was about to decline was unthinkable. Even by 1999, Home Office researchers were predicting a sharp rise in property crime (Dhiri *et al.* 1999). With the benefit of hindsight, however, there were clear signs that improved security was already significantly affecting vehicle crime and that it had the potential to do so more extensively. A young offender interviewed in one of the Home Office studies observed that,

while some vehicle models were easy to steal, others were not, because they had better quality locks:

I just look for cars that are easy to nick – cars that aren't alarmed, general stuff like Fords and MGs and Austins that are easy to get into. *Nissans, Toyotas – mainly Japanese makes like Subaru are really hard to get into because they've got awkward locks.* (young offender, quoted in Light, Nee and Ingham (1993, pp.48–9), italics added)

Light, Nee and Ingham (1993) suggest unfamiliarity with Japanese cars perhaps made their locks appear more awkward, but the same study also found that half of offenders reported they would be deterred by a vehicle alarm. At the time of writing in 2015, car alarms are not viewed as having a particularly strong preventive mechanism and their effectiveness is rather modest (Farrell, Tseloni and Tilley 2011b). But in the 1980s and early 1990s they were more of an unknown quantity, and the fact that half of teenage car thieves would be deterred suggests that adolescent offenders were highly susceptible to even modest security efforts.

Quantifiable evidence of the effectiveness of the vehicle 'high security' noted by Home Office Minister Shaw in the 1980s is provided in the first main report of the Home Office Car Theft Index (Houghton 1992). The report notes that manufacturers were known to have made security improvements to some popular models, and they were invited 'to provide details of those specific ranges for which security had been improved and the extent of the security improvements' (p.12). The details were used to assess the impact of that security on theft risks for those models. Two comparison groups were used to estimate reductions in thefts by Houghton (1992). The most conservative of the estimates is a reduction in theft of 65–70% for the Ford Escort Mark 3, 64–69% for the Vauxhall Cavalier Marks 2 and 3, 38–48% for the Ford Fiesta Marks 2 and 3, and 37.5% for the Vauxhall Carlton (see *Figure 1*).¹

The selection of vehicle models for high security was not random. Two factors were critical. The first was their high theft rate compared with other vehicle models. The second was their prevalence: the four models in *Figure 1* include the first, third and fourth most popular vehicle models on the road at the time (Houghton 1992). Moreover, the distribution of vehicle ownership was extremely skewed, such that: 'Over 20% of the cars on the road in England and Wales are drawn from the top five ranges' (Houghton 1992, p.14). The most popular model, the Ford Escort Mark 3 (on the left of *Figure 1*), with a population of over 1.5 million, had more than 50% more vehicles on the road than the second most popular model.

Implicit recognition of the impact of improved vehicle security of the 1980s is further evident in the fact that the Car Theft Index identified older cars to be more at risk, consistent with newer vehicles having better security. Light, Nee and Ingham (1993) summed it up thus:

Ford and Vauxhalls dominate the high and medium risk groups, while the likeliest cars to be stolen come from a small category of *usually older models* – Capris, Cortinas, Escorts, Fiestas, Metros and Astras. (p.47, italics added)

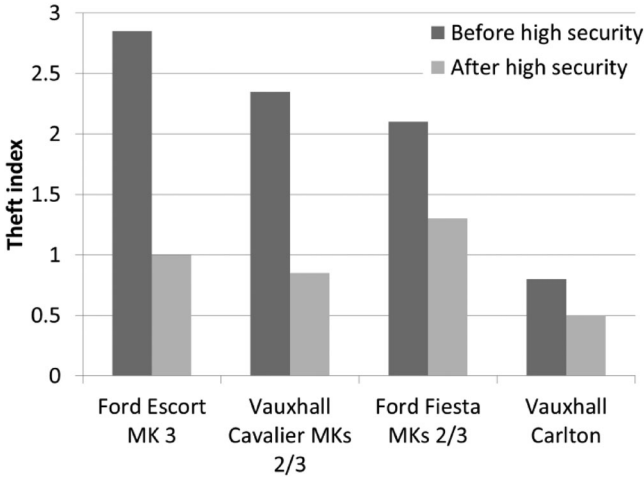


FIGURE 1
Effect of Improved Security on High-risk Popular Vehicle Models
(Source: based on Houghton 1992.)

There is some evidence that, other things including security being equal, older vehicles are at greater risk anyway. One explanation is that the market for second-hand parts experiences increased demand when models cease production: there are still many of these vehicles on the road and so it spurs theft for the parts. Biles (1974) found that one-year-old vehicles accounted for 5.4% of thefts, with the proportion of thefts peaking among eight-year-old vehicles, which accounted for 10.6% of thefts. Brown (1995) found that one-year-old heavy goods vehicles (not subject to improved security) had a theft rate of one per 1,000 registered, rising to seven per 1,000 for nine-year-olds. This issue is important for present purposes because it also suggests that 'new' security may experience a second wind of impact later in the life of those vehicles. If this is so, then the impact of security would continue to increase later in excess of its coverage of the vehicle fleet.

An aside is warranted here to note parallel developments in vehicle security in the United States. They are relevant because they provide independent supporting evidence of the 1980s' implementation and effectiveness of new vehicle devices. The 1992 Report to Congress of the National Highway Traffic Safety Administration (NHTSA) highlights the effectiveness of certain anti-theft devices in the 1980s. The report notes that a 'dramatic success story in theft reduction via antitheft systems is that involving the Pontiac Firebird and the Chevrolet Camaro' (National Highway Traffic Safety Administration 1992, p.19). These were two of the more popular and higher-risk models – the United States equivalent of those above. The report details 'a 67 percent and 65 percent decrease [in theft] for the Firebird and Camaro, respectively' (p.21), which are very similar outcomes. While further research is required, the parallels suggest that the

present study may shed new light on the relationship between vehicle theft and improved security in the United States.²

Impact on Vehicle-related Theft Trends

So far we have established that from the mid-1980s, improved vehicle security:

1. existed and was being introduced by manufacturers;
2. was highly effective;
3. was not implemented universally;
4. was targeted on high-risk vehicles;
5. would have more impact as vehicles aged.

It is important to have established that improved vehicle security had already been introduced – not just developed – much earlier than previously suggested in crime-drop research. Farrell, Tilley and Tseloni (2014) for example, extrapolated from limited Crime Survey for England and Wales (CSEW, formerly the British Crime Survey) data to infer that electronic immobilisers began to be fitted in new vehicles from around 1993 when car theft appeared to begin its decline. That suggestion must now be revised.

Two aspects of the way in which car theft was reduced are particularly noteworthy. The first is the phenomenal *effectiveness* of the improved vehicle security. The second is the *targeting* of high-risk vehicles. It means that the impact upon theft rates would be disproportionate to the coverage of new security in the vehicle fleet. It is well known that crime is extremely concentrated upon a small proportion of targets. Sallybanks and Brown (1999), for instance, showed that 38 high-risk models accounted for less than 1% of models examined but 19% of cars stolen. Security focused on the highest-risk models would impact disproportionately.

The effect upon the national crime rate would be small at first since newly produced high-risk models with effective security would comprise only a small part of the vehicle fleet. With the vehicle crime rate rising quickly at the national level, it would take some time for it to begin to slow that rate of increase. As improved security was installed in a greater proportion of the vehicle fleet, the theft rate would plateau and only gradually begin to decline. Only later would the rate of decline accelerate when a tipping point was reached by sufficient coverage of high security among the vehicle fleet that it became inefficient for would-be thieves to find suitable targets. The additional age-effect identified above, when vehicles failed to become vulnerable to theft for second-hand parts markets, would later add to the rate of decline.

Theft from vehicles would be affected more quickly if improved door locks spread more quickly than vehicle immobilisers: improved door locks are more effective against theft from vehicles than theft of vehicles (Farrell, Tseloni and Tilley 2011b). Theft from vehicles would also fall off faster if

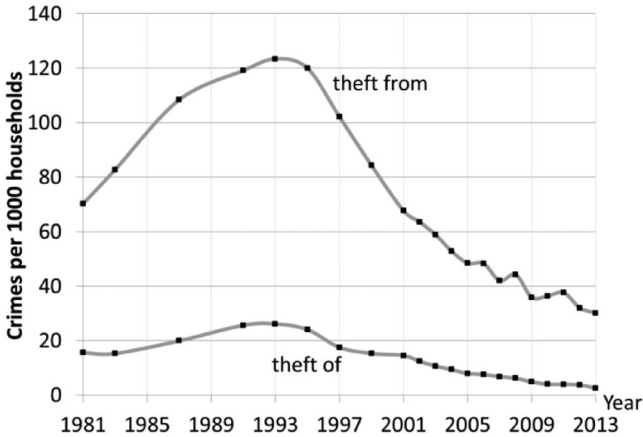


FIGURE 2
 Motor Vehicle-related Theft
 (Source: Crime Survey for England and Wales.)

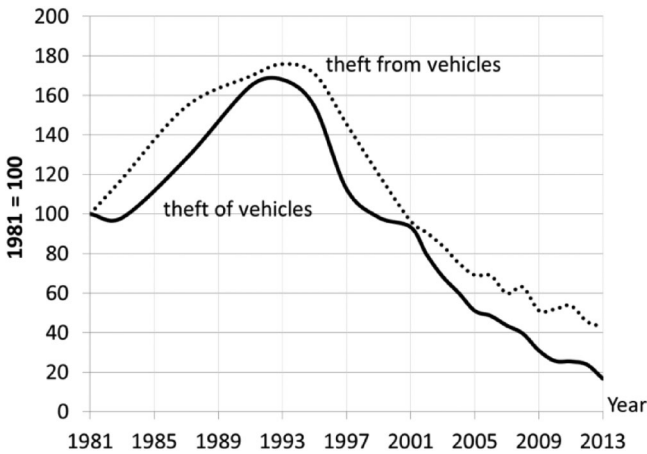


FIGURE 3
 Indexed Trends in Motor Vehicle-related Theft
 (Source: Crime Survey for England and Wales.)

committed by offenders of a younger average age, that is, the novices who are more easily deterred.

Theft from vehicles comprised the bulk of vehicle-related theft in England and Wales (Figure 2) although the trend in theft of vehicles is similar (Figure 3). The rate of increase of both types of vehicle-related theft slows down well before the peak for each crime type. It slows down from 1987 for theft from vehicles and from 1991 for theft of vehicles. This trend

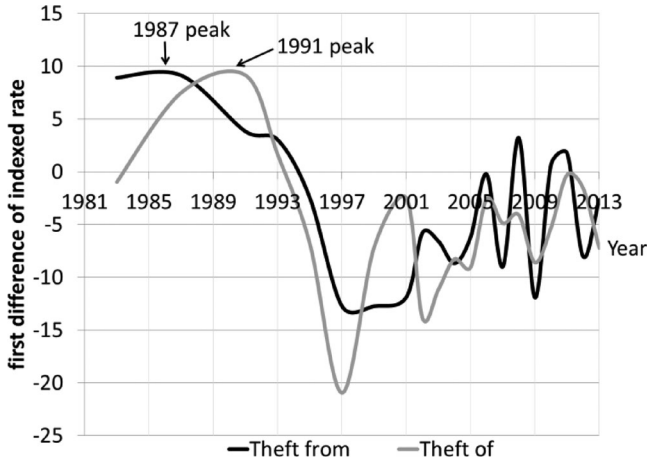


FIGURE 4
Annual Percentage Difference in Vehicle-related Theft Rates
(Source: Crime Survey for England and Wales.)

component is visually clearest when shown as a change in the first differences (*Figure 4*). The first difference is the percentage change in the rate from one year to the next.³

The rate of theft from vehicles decelerated from 1987 and underwent gradual change over the course of the next decade. The trajectory of change of theft of vehicles also occurs gradually with its increase decelerating from 1991 to the 1993 peak, followed by a gradual decline to 1995 before a more rapid decline. The trend has four main components: a slowing of the rate of increase in the crime rate; a plateau and/or peak; a gradual crime rate decrease; and, acceleration of the crime rate decline.

The first differences (*Figure 4*) highlight the importance of change that occurred before the crime rate peaked. This deceleration of the rate of increase has been largely overlooked in previous studies. Having missed this first stage it then becomes easier to overlook the fact that, for vehicle-related theft at least, the first post-peak years were experienced as a gradual decline.

Discussion and Conclusion

The present study complements existing security hypothesis research on vehicle theft. It finds that, following three decades of exponential increase from the 1950s, the rate of increase of vehicle-related theft in England and Wales slowed when improved vehicle security was introduced from the mid-1980s. The proportion of vehicles with security was small at first and security's effect was largely swamped by the continuing increases in theft of other vehicles. It went largely unnoticed at the time. It is now clear

that the crime rate gradually arced over the course of the next decade as improved security on new vehicles spread through the vehicle fleet.

The dramatic effectiveness of improved security measures upon theft rates of the most stolen and popular vehicle models was shown using evidence from the first report of the Home Office Car Theft Index (Houghton 1992). Confirmatory testimony was provided by parallel developments in the United States. With the benefit of hindsight it is clear that contemporary interviews with offenders, conducted before vehicle crime peaked, showed vehicle high security, and perceptions of improved security, to have great potential to reduce crime. For high security to be fitted in vehicles in the mid-1980s it was almost certainly being developed in the 1970s and therefore linked to pressure on manufacturers from that time. This was likely induced by momentum from the agreement between the Home Office and the Society of Motor Manufacturers and Traders to fit steering column locks to all new vehicles from 1971, plus continued Home Office interest (for example, Mayhew *et al.* 1976; Eklblom 1979).

Further research should examine the specifics of which manufacturers did, what, where, and when. It should examine the specifics of individual security measures. It is to be hoped that manufacturers or the insurance industry's Thatcham Research Centre retain the relevant records.⁴ Preliminary evidence was offered that the Home Office played a key role in promoting security development. In the United States it appears that 1984 legislation further incentivised manufacturers (see Brown 2013, p.12).

The two main conclusions of the present study are that:

- (i) what became the 'drop' in vehicle-related theft began earlier than typically understood;
- (ii) the gradual change in the rate over a decade is consistent with new vehicle security gradually permeating the vehicle fleet.

The implication of the present study for crime-drop research is that some reconceptualisation may be required. The search for something sudden that occurred simultaneously for all crime types should be reconsidered in favour of investigating the gradual permeation of the effects of more and improved security devices.

Notes

- 1 The comparison here uses what was referred to as 'drop expected for average car' (Houghton 1992, p.21, *Figure 4*) which appears to be the more sophisticated comparison group than the 'no extra security' group. For the present study, it was necessary to generate the numeric estimates by eyeballing Houghton's *Figure 4*, and so the estimates and ranges can be taken as broadly correct.
- 2 Specifically, our interpretation is that Fujita and Maxfield (2012) find that the uptake of vehicle immobilisers appears rather slow relative to the decline in vehicle theft. We suspect that this is explained by: (i) the tremendous effectiveness of the new security; (ii) the fact that it was targeted at the highest-risk vehicles; and (iii) that these were often the most popular vehicles on the road.
- 3 It is calculated as an annual difference by halving the difference when there were two years between CSEW sweeps, and quartering it when there were four years between sweeps.

- 4 The Thatcham Research Centre was established in 1969 to reduce the cost of motor vehicle insurance claims, and undertakes a range of security-related research (see <http://www.thatcham.org> (accessed 10 December 2015)).

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Date submitted: August 2015

Date accepted: November 2015