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# **CONTROLLING CRIME**

## **FACILITATORS: EVIDENCE FROM**

### **RESEARCH ON HOMICIDE AND**

#### **SUICIDE**

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by

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*Abstract\* This review analyzes a body of research conducted by Lester and his colleagues in the last ten years on the effects of limiting access to lethal methods for suicide and for homicide. Results provide evidence that limiting access to a preferred method of committing suicide and homicide has a preventive effect, more clearly so for suicide than for homicide. However, there was also evidence that some switching of method may take place after limiting access to one method, again more clearly for suicide than for homicide. However, the body of research as a whole indicates that this line of investigation may prove fruitful in the future for documenting the impact of restricting access to lethal implements in the prevention of crime, and of other social and public health problems.*

### **INTRODUCTION**

Situational crime prevention assumes that crime can be prevented, at least to some extent, by reducing opportunities for crime. If, for example, installing burglar alarms on cars makes it more difficult for thieves to steal cars, then car theft should decrease. The arguments supporting this approach to crime prevention were put forward by Clarke (1980), and some supporting research has appeared since (Clarke, 1992).

One problem in finding strong supporting evidence for this approach to crime prevention is that experiments are hard to devise. Instead,

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researchers usually take naturally occurring changes in society and in the laws and customs of the society and investigate their effect on crime. For example, Clarke (1990) investigated the effects of introducing Caller-ID in New Jersey on the incidence of obscene telephone calls. An *experiment* would randomly divide the states of America two groups, one of which would have Caller-ID while the other group would not. Then the changes in the rate of obscene calls would be compared in the two groups of states. Clarke was not able to do this, of course, but had to use a naturally occurring change in telephone services without random assignment of conditions.

One major objection to situational crime prevention is that criminals will simply switch to other forms of crime. For example, our car thief might now mug people. Our obscene telephone callers, who now fear identification through Caller-ID, might turn to exhibitionism. This *displacement* effect is both hard to demonstrate and hard to rule out; advocates of situational crime prevention would, of course, like to rule it out.

In an effort to show that displacement was unlikely to occur (or, at any rate, was not likely to occur to a large extent), Clarke turned in the mid-1980s to the study of suicide. He explored whether it might be possible to document that limiting access to lethal methods for killing would be effective in reducing the suicide rate, and that displacement was unlikely to occur to any great extent. This idea was suggested by the apparent fact that the detoxification of domestic gas in England and Wales in the 1960s and 1970s not only reduced the rate of suicide using domestic gas to almost zero, but also was not accompanied by a corresponding increase in the rate of suicide by all other methods. Thus, the overall suicide rate in England and Wales declined by about 30% during this period of detoxification (Kreitman, 1976). If displacement is rare in suicide, perhaps it would also be rare in crime, for, as Clarke and Mayhew (1988:80) argued, "If opportunity determines not merely the time, place, and method but the very occurrence of a behavior that is usually seen to be the outcome of strong internal motives [that is, suicide], the same is likely to be true of crime, most of which seems less deeply motivated."

Of the 12 techniques of situational crime prevention described by Clarke (1992), the research on restricting access to lethal methods for suicide is relevant to that of *controlling facilitators*. In the last ten years, Lester and his colleagues have conducted a large number of studies on the effect of restricting access to lethal implements on both suicide and homicide rates. The early studies in this series were presented in Clarke and Lester (1989), but most of the research has appeared since then and

has not been comprehensively reviewed, though two partial summaries have appeared (Lester, 1988a, 1991d). This paper will review the research, explore its implications for controlling facilitators and, in particular, examine whether the research results provide evidence relevant to the possibility of displacement of method—an issue not previously explored in the reviews of the work. Although other investigators have occasionally explored this topic in recent years, they have rarely used sophisticated statistical techniques (such as regression analysis), or presented their results in a format permitting them to be included in a standardized meta-analysis. Thus, this essay does not attempt to review research conducted by other investigators.

The studies by Lester and his colleagues on the relationship between firearm availability and firearm use for homicide and suicide are reviewed first. Next, the effects of the availability of toxic domestic gas, toxic car exhaust and medications on suicide are reviewed. In the final section, the results of these studies are summarized in tabular form so that the evidence for a preventive effect and for displacement can be examined, and the conclusions that are readily apparent are discussed. This essay will not explore possible methodological criticisms of each study due to limitations of space.

## **FIREARMS, HOMICIDE AND SUICIDE**

### **The Effect of Strict Handgun Control Laws**

States with stricter gun control laws make it more difficult for residents to purchase guns, at least in the short run by, for example, requiring permits for purchase and waiting periods of several days between application for a permit and receiving the permit. Lester and Murrell (1980) created a Guttman scale of strictness for the handgun control laws of the 48 continental states of the U.S. in 1968, based on codings provided by Bakal (1968). However, they studied only the association between the strictness of the handgun laws and the *overall* suicide rate. Later studies (Lester and Murreli, 1982; Lester, 1984) which remedied this, indicated that a preventive effect of strict handgun control laws was found *for firearm* suicide rates, but not for suicide rates by poisons and hanging. However, the suicide rate by all remaining methods was positively associated with the strictness of handgun control laws. Lester concluded, therefore, that switching from guns to other suicide methods was probably minimal, and a clearer analysis of the data (Lester 1988a) showed that the use of all methods other than firearms was not significantly related to the strictness of the states' handgun control laws.

Further analysis of the data (Lester and Murrell, 1982; Lester, 1984) showed that restrictions on the selling and purchasing of handguns were the most critical characteristics of the laws in the association with lower firearm suicide rates. Restrictions on carrying were unrelated to firearm suicide rates. This finding seems reasonable because, since firearm suicides usually occur in the home, restrictions on carrying firearms outside of the home would be expected to have little impact on their use for suicide.

Finally, controls for social variables (such as percent of blacks and percent of males in each state) did not eliminate these associations. The association of strict handgun control laws with firearm suicide rates, taking into account other social variables, was replicated by Yang and Lester (1991). Critics of the research on controlling facilitators and suicide often mention the need to control for other possibly influential variables using multiple regression analysis. However, if enough other variables are inserted into a multiple regression analysis, it is often possible to eliminate the role of any target variable. There are also no clear guidelines for which control variables should be included. In this study on firearm availability and suicide, the control variables did not eliminate the preventive effect. However, Lester has not controlled for other possible influential variables in subsequent research, focusing instead on documenting whether there is a simple preventive effect. At the very least, the variety of the lethal methods, nations and research designs reviewed below, which document the preventive effect on suicide of controlling facilitators, makes the hypothesis of controlling facilitators the most parsimonious theoretical explanation.

Lester and Murrell (1981, 1982) and Lester (1987a) also studied the impact of handgun control laws on firearm homicide rates and accidental deaths from firearms. These studies provide a means of comparing the impact of strict handgun control laws on suicide, homicide and accidental deaths. The Pearson correlations, which should be negative to show a preventive effect from strict handgun control laws, supported the hypothesis better for suicide than for homicide or accidental death. For homicide, the correlation coefficients failed to reach statistical significance, while for accidental death the association for the absolute change in the accidental death rate was positive. However, in these studies Lester and Murrell did not explore the associations for suicide and homicide by all methods other than firearms combined in order to provide adequate data on the phenomenon of switching.

### **Indirect Measures of Firearm Ownership**

There are no measures of firearm ownership available for each U.S. state. Consequently, Lester has used several indirect measures to estimate gun availability proposed by other investigators, especially Cook (1982). Cook suggested using as indirect measures of firearm availability the accidental death rate from firearms and the percentage of particular types of crime (such as murder, armed robbery and rape) in which the perpetrator used a firearm. Following Cook's suggestion, Lester argued that regions where guns were more available should have a higher rate of accidental deaths from firearms (the same measure as Cook used in his study of crime), a greater use of firearms for homicide and for suicide (analogous to Cook's measure of firearm use in crimes such as murder and armed robbery), and a higher rate of subscriptions to magazines focusing on firearms (a new measure proposed by Lester).<sup>1</sup> The validity of these indirect measures of firearm ownership is uncertain at the present time,<sup>2</sup> but the results of the research reported here provide some construct validity for them. For example, if the accidental death rate from firearms in the U.S. states is positively associated with the firearm suicide rate, not only does this result provide support for situational suicide prevention, but also it provides construct validity for the use of the accidental death rate from firearms as an indirect measure of firearm ownership.

Turning to the results of Lester's research, for 1970 the firearm suicide rate was significantly associated with the percentage of suicides using firearms, the percentage of homicides using firearms, the accidental death rate from firearms, handgun control law strictness, and subscriptions to *Shooting Times* and *Guns & Ammo*. This finding provides evidence of a preventive effect from limiting access to firearms (that is, the correlation between greater firearm availability and the firearm suicide rate was positive). The suicide rate from all methods other than firearms gave correlations indicative of switching for the percentage of suicides by firearms, the percentage of homicides by firearms, the accidental death rate from firearms, and subscriptions to *Shooting Times*. In other words, the correlation between greater firearm availability and the suicide rate by all methods other than firearms was negative, but not for the strictness of handgun control laws or subscriptions to *Guns & Ammo*. The data for magazine subscriptions for 1980 showed no evidence of switching. The results of these studies are summarized in Table I.<sup>3</sup>

The results for homicide indicate that the accidental death rate from firearms and the percentage of suicides using firearms were associated

**Table 1: Summary Of Studies by Lester On Switching/Displacement for Firearms**

	Preventive Effect <sup>#</sup>	Evidence for Switching <sup>#</sup>	
<u>Homicide</u>			
American states, 1970			
Accidental firearm death rate	yes	no	Lester 1991d
Percent homicides with firearm	yes	no	Lester 1991d
Percent suicides with firearm	yes	no	Lester 1991d
<i>Shooting Times</i>	no	possibly*	Lester 1991d
<i>Guns &amp; Ammo</i>	no	yes	Lester 1991d
Handgun control laws	no	no	Lester 1991d
American states, 1980			
<i>Shooting Times</i>	no	no	Lester 1991d
<i>Guns &amp; Ammo</i>	no	no	Lester 1991d
<i>American Handgunner</i>	no	no	Lester 1991d
Regions, 1970			
Accidental firearm death rate	yes	no	Lester 1991d
Percent homicides with firearm	yes	no	Lester 1991d
Percent suicides with firearm	yes	no	Lester 1991d
<i>Shooting Times</i>	possibly	no	Lester 1991d
<i>Guns &amp; Ammo</i>	no	possibly	Lester 1991d
Estimates of actual gun ownership	yes	no	Lester 1991d
Nations, 1980			
Percent suicides with firearm	yes	no	Lester 1991c
Accidental firearm death rate	yes	possibly	Lester 1992
<u>Suicide</u>			
States, 1970			
Accidental firearm death rate	yes	yes	Lester 1988a
Percent homicides with firearm	yes	yes	Lester 1988a
Percent suicide with firearm	yes	yes	Lester 1988a
<i>Shooting Times</i>	yes	yes	Lester 1988a
<i>Guns &amp; Ammo</i>	yes	no	Lester 1988a
Handgun control laws	yes	no	Lester 1988a
States, 1980			
<i>Shooting Times</i>	yes	no	Lester 1989a
<i>Guns &amp; Ammo</i>	yes	no	Lester 1989a
<i>American Handgunner</i>	yes	no	Lester 1989a
Regions, 1980			
Accidental firearm death rate	yes	yes	Lester 1988a
Percent homicides with firearm	yes	yes	Lester 1988a
Percent suicides with firearm	yes	yes	Lester 1988a
<i>Shooting Times</i>	yes	yes	Lester 1988a
<i>Guns &amp; Ammo</i>	yes	no	Lester 1988a
Estimates of actual gun ownership	yes	yes	Lester 1988c
Australia, states			
Estimates of actual gun ownership	yes	yes	Lester 1988c
Nations, 1980			
Percent homicides by firearm	yes	yes	Lester 1990a
Percent suicides by firearm	yes	yes	Lester 1990a
Accidental firearm death rate	yes	possibly	Lester 1992

\* indicates that the effect was not statistically significant or not found for all groups studied

# for definitions, see text

with the firearm homicide rate and did not show evidence of displacement. However, per capita subscriptions to firearms magazines were not, in general, associated with homicide rates (see Table 1).

The data were also examined for the nine major regions of the U.S. For these regions, the firearm suicide rate was associated with the percentages of suicides and homicides by firearms, the accidental death rate from firearms, and the two magazine subscription rates (see Table 1). The suicide rate by all other methods showed evidence of switching for all the measures except subscriptions to *Guns & Ammo*. For homicide rates, the indirect measures of gun ownership were associated with the firearm homicide rate, and there was no evidence for switching (see Table 1).

Lester (1990a, 1992) has shown that the percentage of homicides using firearms in each of a sample of 20 nations was positively associated with the nation's firearm suicide rates and negatively associated with the suicide rate by all other methods, indicating evidence of displacement. The percentage of suicides using guns was associated positively with the firearm suicide rate and negatively associated with the suicide rate by all other methods, again indicating that displacement may have occurred.<sup>4</sup> The accidental firearm death rate was positively associated with the firearm suicide rate, and had a tendency toward a negative association with the suicide rate for all other methods, again indicating displacement.

For homicide rates in these nations, Lester (1991c) showed that the association between the percentage of suicides using firearms and the firearm homicide rate was positive, while the association between the percentage of suicides using firearms and the nonfirearm homicide rate was not significantly different from zero, indicating that displacement probably had not occurred. The associations between the accidental death rate from firearms and the homicide rate by firearms and by all other methods also indicated a preventive effect and that displacement probably had not occurred.

#### *Actual Firearm Ownership*

Estimates of actual firearm ownership are available for the nine major regions of the continental U.S. from surveys conducted with samples of residents in each region (but not for the 48 individual states). The results from studies by Lester (1988b, 1988c) over the regions of America and over the states of Australia indicate that gun ownership is associated positively with the firearm suicide rate and negatively with the suicide rate by all other methods, providing evidence of displacement. Homicide

data, available only for the U.S., indicated that gun ownership was positively associated with the firearm homicide rate and not significantly associated with the homicide rate by all other methods, indicating that displacement may not have occurred.

### *Time-Series Analyses*

The previous studies analyzed data for the states and major regions of the U.S. and Australia. Clarke and Jones (1989) obtained data on the household ownership of firearms in the U.S. as a whole from 1959 to 1984, using data from national polls. Their time-series analysis indicated that the ownership of handguns was associated with the firearm suicide rate and with the overall suicide rate. Yang and Lester (1989) found, however, that *changes* in the estimate of handgun ownership from year to year were not associated in these data with *changes* in the firearm suicide rate. This is not surprising given the relatively crude estimates of firearm ownership, but the methodology is an important one to bear in mind in future research on this issue. Lester and Clarke (1991) found that the incidence of accidental firearm deaths was positively related to the ownership of shotguns and negatively related to the ownership of handguns—the opposite pattern to that found for homicide and suicide.

However, in a study of all firearm deaths in the U.S. in May 1989, Lester (1989h) found that handguns were involved in 63% of the suicides, 67% of the accidental deaths and 77% of the homicides. Thus, handguns appear to be the most common firearm involved in all three types of firearm deaths. It is therefore difficult to speculate at the present time for the interesting differences in the time-series results for suicides and accidental deaths identified by Clarke and Jones (1989) and by Lester and Clarke (1991).

Lester (1990d) found that the accidental death rate from firearms in the U.S. from 1950 to 1984 was *negatively* correlated with the suicide rate from firearms—results contrary to an availability hypothesis. Lester and Abe (1990) found that the accidental death rate and the suicide rate from firearms were positively associated over time in Japan. In Northern Ireland, the suicide rate using firearms was not related to the accidental death rate from firearms or to the percentage of homicides using firearms (Curran and Lester, 1991). However, none of Lester's time-series studies on firearm availability and the firearm suicide rate examined whether displacement might have taken place.

## CAR EXHAUST AND SUICIDE

### *Detoxifying Car Exhaust in the U.S.*

**In** 1968, the U.S. began to impose emission controls for motor vehicles in order to improve air quality. The result was that the carbon monoxide content in car exhaust dropped from 8.5% to 0.05% by 1980. This has made suicide more difficult to commit using car exhaust. Fatal poisoning from car exhaust now takes much longer, increasing the risk of intervention by others and changes of mind in the suicidal person.

Clarke and Lester (1987; Lester and Clarke, 1988) explored the effects of the reduced toxicity of car exhaust on the use of car exhaust for suicide in the U.S., and they compared this trend with the same period in England and Wales, where emission controls have *not* been imposed on motor vehicles.

Clarke and Lester (1987) found that the use of car exhaust for suicide in the U.S. has leveled off and perhaps slightly declined since 1968. (It must be remembered that older, more toxic cars are still in use and that the emission control system can be disconnected to permit gas richer in carbon monoxide to fill the car or garage.) In contrast, in England and Wales, the use of car exhaust for suicide has risen dramatically since 1970. Clarke and Lester (1987) also documented that accidental deaths from car exhaust in the U.S. declined as car exhaust was rendered less toxic

Confirming this latter finding, Lester (1990d) found that the U.S. accidental death rate from car exhaust was positively associated over time with the suicide rate from car exhaust, and Lester and Abe (1990) replicated this result in Japan. Lester (1989d) found that in the U.S. from 1950 to 1984, the use of car exhaust for suicide by men was related to the toxicity index of the cars (the per capita ownership of cars weighted by the emission controls in force when they were built), whereas the use of car exhaust for suicide by women was related to the per capita ownership of cars. Lester (1989g) found that the male suicide rate by car exhaust dropped immediately, whereas the female rate rose for another eight years before it began to decline. None of Lester's studies reviewed so far in this section, however, explored the possibility of displacement.

Lester and Abe (1989c) found that suicide by car exhaust in Japan rose from 1965 to 1982, along with increasing car ownership. Meanwhile, suicide by all other methods also rose during this period. After weak emission controls were introduced in 1975, the suicide rate using car exhaust leveled off. These data, therefore, show little evidence of

switching because, as suicide by car exhaust became more common, so did suicide by other methods! In Northern Ireland, Curran and Lester (1991) found that suicide using car exhaust became more common from 1964 to 1988 as car ownership increased. As in Japan, suicide by all other methods increased too during this same period.

#### *A Regional Study of Car Ownership and Suicide*

Lester and Frank (1989) explored the relationship between a simple measure of overall car ownership in the states of the U.S. (regardless of the year in which the car was made) and the use of car exhaust for suicide. They found that the per capita ownership of cars was related to the suicide rate using car exhaust but not to suicide rate by all other methods. Thus, the more cars were available in a state, the more they were used for suicide, and switching does not appear to have occurred.

### **DOMESTIC GAS AND SUICIDE**

Clarke and Mayhew (1988) documented the gradual detoxification of domestic gas in England and Wales and the accompanying declining suicide rate overall and using domestic gas. They showed that the two curves follow each other extremely closely. In 1958, there were 2,637 suicides using domestic gas out of 5,298 suicides (49.8%). By 1977, there were eight suicides using domestic gas out of 3,944 overall (0.2%). Over this period, therefore, there were 35% more suicides in England and Wales at the beginning of the period than at the end. Though the number of suicides by all other methods rose from 2,661 to 3,936, this increase was not sufficient to offset the decrease in the use of domestic gas. Thus, restricting access to a very popular method for suicide reduced the *overall* suicide rate in this instance.

Clarke and Mayhew (1989) next explored why Scotland and the Netherlands did not experience an overall decline in their suicide rate as domestic gas was detoxified. They presented evidence to show that the suicide rates were rising in those two nations when domestic gas was detoxified, and they argued that this rising suicide rate masked the effect of the detoxification of domestic gas on the overall suicide rate.

Lester (1991a) replicated the study by Clarke and Mayhew in the Netherlands, using regression analysis, and found that the detoxification of domestic gas was accompanied by a decrease in its use for suicide but also by an increase in the use of other methods, providing evidence for displacement. Lester and Hodgson (1992) replicated the study of Clarke and Mayhew in Scotland, and found that detoxification of domestic gas did reduce its use for suicide without apparent evidence of displacement.

In Northern Ireland as well, detoxification of domestic gas was not accompanied by an increase in the rate of suicide using all other methods (Curran and Lester, 1991).

Lester (1990b) documented that, as domestic gas was detoxified in the U.S. in the 1950s, there was a corresponding decrease in the use of domestic gas for suicide. At the same time car ownership was increasing, and the data for men show that men may have switched from domestic gas to car exhaust for suicide. However, switching between these two methods for suicide did not appear to have occurred for women.

Lester and Abe (1989a) studied the effects of the detoxification of domestic gas on suicide in Japan from 1969 to 1982. They found that the suicide rate by domestic gas and the production of toxic gas showed a similar pattern. Both increased until the early 1970s, whereupon both showed a dramatic decrease. It appears, therefore, that as the availability of toxic domestic gas decreased, the use of domestic gas for suicide also decreased. What about the suicide rate by all other methods? Lester and Abe (1989a) showed that the suicide rate by all other methods rose during this period. The slope of the linear regression line for this plot from 1969 to 1975 was 455.25 and for 1975 to 1982 was 114.18. Thus, it appears that use of all other methods for suicide rose at a lower rate during the latter part of the period under study than in the first part. As toxic gas became less available, the increasing suicide rate by all other methods rose at a *slower* pace. Thus, it is clear that displacement to other methods for suicide did not take place (for then the suicide rate by all other methods would have risen at a faster pace).

Lester (1990e) found that as domestic gas was detoxified in Switzerland, not only did the suicide rate using this method decline, but there was no increase in the rate of suicide by all other methods, indicating that people did not switch methods for suicide once domestic gas became less toxic

Lester (1990d) found that the accidental death rates from all gases in the U.S. from 1950 to 1984 were positively associated with the suicide rate from gases, and Lester and Abe (1990) replicated this result in Japan. However, these two studies did not examine the possibility of displacement.

#### *A Regional Study in England*

Lester (1990c) tried to explore whether the detoxification of domestic gas or the presence of a suicide prevention center had an effect on the suicide rate of cities in England. He found no significant effects from either variable, but the sample sizes were small and the cities with less

toxic gas at the end of the study period still had high levels of carbon monoxide. Displacement was not studied.

### OVERDOSES AND SUICIDE

Lester (1989c) reported data indicating that when sedatives were restricted in Australia in the 1960s, their use for suicide declined without a simultaneous increase in the use of other methods.

In the U.S. from 1960 to 1974, Lester (1989f, 1990f) found that the suicide rate using barbiturates was associated with the annual sales of barbiturates and with the accidental death rate from barbiturates. Lester (1990d) reported that, in the U.S. from 1950 to 1984, the accidental death rate from solids and liquids, as well as specifically from barbiturates, was positively associated with the suicide rates from these methods. Lester (1991b) found that the association between suicidal and accidental deaths rates over time in the U.S. from 1979 to 1987 was positive and strong for barbiturates and other sedatives and hypnotics, but not for analgesics/antipyretics/antirheumatics or for tranquilizers and other psychotropic agents. Lester and Abe (1990) replicated this result in Japan for medicaments. However, none of these studies examined the occurrence of displacement.

Lester (1985a, 1989b) found that, for the states of the U.S., accidental death rates from poisoning by solids/liquids and by gases were positively associated with the suicide rates using these two methods. Lester and Agarwal (1989) found a similar association for poisoning in general over the regions of India. Neither of these studies examined the possible occurrence of displacement to other methods for suicide.

A study of prescriptions in Japan did, however, examine the possible role of displacement. In Japan prior to 1961, barbiturates were available over the counter without a prescription. From February 1, 1961, the Pharmacy Act S.49 required prescriptions for both barbiturates and meprobamate. Lester and Abe (1989b) examined the use of sedatives and hypnotics for suicide prior to and after the implementation of the Pharmacy Act of 1961. The suicide rate using sedatives and hypnotics peaked at 7.05 per 100,000 per year in 1958. Thereafter the suicide rate by sedatives and hypnotics declined consistently. Thus, at the time when the Pharmacy Act was implemented in 1961, the suicide rate using sedatives and hypnotics was already declining. The slope of the declining regression line did increase a little after the implementation of the Pharmacy Act. The suicide rate by all other methods was examined for the same time period. The suicide rate by all other methods began declining even earlier, after 1955 in fact, and continued to decline until

1965. Thus, there is no evidence that people switched methods for suicide once prescriptions were required for sedatives and hypnotics.<sup>5</sup>

**SUMMARY OF THE RESEARCH RESULTS AND DISCUSSION**

The present paper has reviewed a series of regional and time-series studies by Lester and his colleagues on the effects on suicide and homicide rates of reducing the availability of firearms, and the effect on suicide rates of reducing the availability of medications, toxic car exhaust and toxic domestic gas. All relevant published papers have been cited to avoid problems of biased selection, and the evidence for both reduction in the use of the restricted method for suicide or homicide and for displacement to other methods was examined. The results of all of the relevant studies on reduction/prevention and switching/displacement are summarized in Tables 1 and 2. In these tables a preventive effect means that restricted access to a lethal method for suicide was associated with a statistically significant *lower* suicide rate by that *same method*. A

**Table 2: Summary of Studies by Lester and Colleagues on Switching/Displacement for Various Methods of Suicide**

	type of study	preventive effect <sup>#</sup>	evidence for switching <sup>#</sup>	
<b><u>Domestic Gas</u></b>				
Japan	time series	yes	no	Lester & Abe 1989a
The Netherlands	time series	yes	yes	Lester 1991a
Northern Ireland	time series	yes	no	Curran & Lester 1991
Scotland	time series	yes	no	Lester & Hodgson 1992
Switzerland	time series	yes	no	Lester 1990e
U.S.A.	time series	yes	possibly*	Lester 1990b
<b><u>Car Exhaust</u></b>				
Japan	time series	yes	no	Lester & Abe 1989c
Northern Ireland	time series	yes	no	Curran & Lester 1991
U.S.A.	regional	yes	no	Lester & Frank 1989
<b><u>Prescriptions</u></b>				
Australia	time series	yes	no	Lester 1989c
Japan	time series	yes	no	Lester & Abe 1989b
<b><u>Drowning</u></b>				
U.S.A.	regional	yes	yes	Lester 1989e

\* indicates that the effect was not statistically significant or not found for all groups studied  
<sup>#</sup> for definitions, see text

switching/displacement effect means that restricted access to a lethal method for suicide was associated with a statistically significant *higher* rate of suicide by *all other methods*.

Looking first at the results for access to firearms and homicide and suicide rates (Table 1), it can be seen that the preventive effect of restricted access to firearms on homicide rates was found in nine analyses, possibly found in one analysis and not found in seven analyses. In contrast, the preventive effect of restricted access to firearms on suicide rates was found in all 19 analyses. Thus, the preventive effect of restricted access to firearms is clearly stronger for suicide than for homicide.

The evidence for displacement showed the opposite trend. For homicide rates, switching was present in one analysis, possibly found in three analyses and not found in 13 analyses. In contrast, for suicide, switching was present in 12 analyses, possibly present in one and not present in six. Thus, displacement seems to be more likely for suicide than for homicide.

Kleck (1991) reviewed a few of these studies as well as some additional research, and concluded that the evidence for a preventive effect of restricted access to firearms on homicide and suicide was not proven. The present review suggests that his negative conclusion is unwarranted. The research reviewed here is reasonably supportive of a preventive effect, and certainly suggests the need for more research on this important issue to document under what conditions a preventive effect may operate.

Looking at the results of restricting access to lethal means for suicide other than firearms (see Table 2), it can be seen that all 12 of the studies found a preventive effect. In addition, two studies found evidence for switching, one possibly found evidence, and nine studies found no evidence. Thus, restricting access to lethal methods for suicide appears to have a preventive effect on suicide for both firearms and other methods. Furthermore, switching seems to be less likely to occur for these other methods than for firearms.

There are at least two possible explanations for the finding that switching methods for suicide was more probable after limiting firearms than after limiting access to medications and gases. First, the studies of firearm availability did not assess the impact of severely limiting firearms. Most of the measures of firearm availability assessed the ownership of firearms in regions where firearm ownership was relatively common. In contrast, detoxification of domestic gas and restricting prescriptions makes these methods for suicide much less available.

A second possibility is that firearms may be among the least acceptable methods of suicide to most people; if so, they would be less easily substituted for other methods when access to the latter is restricted. On the other hand, people may be more willing to try another method when access to firearms is denied. Some support for this line of argument is provided by Lester (1988e, 1989i), who found that non-suicidal people who chose firearms as their (hypothetical) preferred method for suicide rated other methods as relatively acceptable, whereas those choosing overdoses as their preferred method for suicide rated other methods (including firearms) as relatively unacceptable.

Though the research reviewed in this paper does not permit a definitive conclusion as yet, the results do indicate that restricting the availability of a lethal method may reduce its use for suicide and homicide and does not always lead to switching methods. More research is needed on which classes of people are likely to switch methods and under what conditions (Lester et al., 1989), and on the extent to which people who do switch methods if one becomes less available, switch to more lethal methods versus less lethal methods. (If people switch to less lethal methods, potentially fatal suicidal actions may be replaced by non-fatal suicidal actions and murders may be replaced by attempted murders.) For example, perhaps the elderly may be less likely to switch methods for suicide if their preferred method is unavailable. Different methods may also differ in their acceptability in different cultures. For example, Americans may be unlikely to switch to pesticides for suicide if medications are unavailable, whereas pesticides and fertilizers are the preferred method for residents of underdeveloped nations. Clarke and Mayhew (1989) discussed the differences in the way in which suicide by domestic gas was viewed in England and in the Netherlands, and how this might have affected the responses to the detoxification of domestic gas in the two nations.

The research reviewed in this paper has implications for theories of suicide and murder. It is common to think of extreme violence as a desperate measure, chosen by seriously dysfunctional people who are at their wits' end. It seems unlikely that such people would be deterred by the effort needed to overcome the restrictions placed upon obtaining their preferred method for violent death.

However, the present viewpoint suggests that extreme violence, such as suicide, may be "an intentional act, the outcome of a decision made with varying degrees of rationality and determination" (Clarke and Lester, 1989:98). One of the elements involved in this decision may be the availability of different methods for committing suicide. Many people when asked how they would commit suicide, for example, say

that they would consider one and only one method for suicide (Lester, 1988d). If access to this method were restricted, then suicide by these people might well be averted. The necessity of switching to a less-preferred method may introduce costs that were not originally present (Yeh and Lester, 1987). For example, those who fear the pain of a bullet and the disfigurement of the wound would in all probability *not* switch to firearms were medication no longer available. For murder, it may be easier for some people to kill "at a distance" with a gun than to use methods for murder that involve closer contact with the victim, such as knifing or strangulation.

Clarke and Lester (1989) stressed the need for more research on the "choice-structuring properties" of methods of suicide and homicide, that is, the properties of each potential method of suicide that may be taken into account by an individual. For suicide, they listed such factors as availability, familiarity with the method, technical skills necessary, planning necessary, likely pain, courage needed, consequences of failure, disfigurement after death, danger and inconvenience to others, messiness, contamination of the home, scope for concealing or publicizing the suicide, certainty of death, time taken to die, scope for second thoughts, chances for intervention, symbolism, masculinity/femininity and dramatic impact.

For suicide by firearm, for example, the act is quick, with little chance of intervention or scope for second thoughts, but messy and disfiguring. Although such listings as that provided by Clarke and Lester are interesting, research needs to be conducted on those who make near-fatal attempts at suicide or murder in order to explore the choice-structuring properties that were important to them, and their likelihood of switching methods had their preferred method been unavailable.



#### NOTES

1. The individual studies by Lester (1985a, 1987b, 1988b, 1989a, 1989b) were combined, reanalyzed in a consistent style and reported by Lester (1988a) for suicide and by Lester (1991d) for homicide. This paper and the summaries of the research in Table 1 utilize these two extensive reports.
2. Lester (1985b) found that the percentage of suicides committed with a firearm in American cities was positively associated with the use of firearms for murder, robbery and assault, providing some concurrent validity for the measures.
3. Several of the studies conducted by Lester were not designed to explore the evidence for or against displacement. Tables 1 and 2 summarize the results only

of studies that examined both the preventive effect of controlling facilitators *and* the displacement effect. The studies that failed to attend to both issues are referred to in the body of the paper, with a note to the effect that displacement was not studied, and they are mentioned in passing to avoid the criticism that only selected studies which support the thesis of this paper have been included. All research conducted by Lester relevant to controlling facilitators has been cited in this paper so that readers may locate it easily and make their own evaluation.

4. Incidentally, the percentages of suicides and homicides using firearms were also positively associated.

5. Lester (1989e) found that American states adjoining the oceans or the Great Lakes had higher suicide rates by drowning, lower rates by firearms, but similar rates by all other methods. These results (the higher rate of firearm suicide in states with no access to oceans or the Great Lakes) suggest that displacement may have taken place. However, many suicides by drowning do not use the oceans, and the study would have been sounder had suicide by drowning only in oceans been studied.

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