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Characteristics of Internationally Trafficked Stolen Vehicles along the U.S.-Mexico Border

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Abstract*: Trafficking of stolen vehicles has been the subject of few studies in the United States. Little is known about patterns and characteristics of vehicles that are stolen for international export. The current research constructs a logistic regression model to identify variables associated with international vehicle trafficking in Chula Vista, California. Vehicle, spatial, and temporal independent variables are developed, including those tested in previous research and variables presented in this study for the first time. The results show that the strongest predictors differentiating vehicles recovered in Mexico from domestically recovered thefts are the type of vehicle and age. Specifically, newer sport-utility vehicles, trucks and vans are more likely to be recovered in Mexico than the U.S. None of the variables related to space and time are statistically significant predictors in the model using 95 percent confidence intervals. Policy implications emanating from this research include more focused patrol and public awareness campaigns to proactively reduce this harmful form of vehicle theft.*

Keywords: crime analysis, environmental criminology, motor vehicle theft, transnational crime

INTRODUCTION

The theft of motor vehicles (MVT) for the purpose of international export harms direct victims, communities, and all insured vehicle owners. When vehicles are stolen and taken out of the country, victims may miss work, suffer emotional consequences, and often must pay for some or all of a replacement vehicle. Similarly, indirect victims are affected by the way stolen vehicles are driven and elevated insurance costs. Although international vehicle trafficking has been observed for over 30 years in the United States, changes in the national distribution of MVT indicate that the issue has become a particularly widespread problem at the U.S.-Mexico border over the past two decades. The National Insurance Crime Bureau (NICB) has estimated that approximately 200,000 vehicles are stolen from the U.S. on an annual basis for export (Clarke and Brown 2003; United States General Accounting Office 1999), yet very little has been established about the patterns and characteristics of vehicles illegally taken for this purpose.

Vehicles can be exported from a country via one of three methods: air, sea, and land borders. Based on the immense costs and difficulties associated with flying vehicles out of the country, most exported stolen vehicles are assumed to be moved across borders to Canada or Mexico, or through seaports on the coasts (Brown and Clarke 2004; Clarke and Brown 2003). At the U.S.-Mexico border alone, over 30 international crossings in California, Arizona, New Mexico, and Texas serve as potential routes for vehicle exportation. In addition, the presence of seaports permits vehicles to be shipped out of the country on roll-on/roll-off shipping boats and in 40-foot containers (Clarke and Brown 2003).

Previous studies of vehicle trafficking in the U.S. are mostly limited to qualitative accounts of organized crime groups (Resendiz 1998, 2001; Resendiz and Neal 1999; Richardson and Resendiz 2006), analysis of insurance company data (Field, Clarke and Harris 1991), and evaluations or discussion of prevention measures (Ethridge

and Sorensen 1993; Plouffe and Sampson 2004). The current study seeks to fill gaps in the literature on stolen vehicle exporting by exploring vehicle-related, spatial, and temporal characteristics that differentiate vehicles stolen in the U.S. and recovered in Mexico from vehicles stolen in the U.S. and recovered domestically. Logistic regression models are developed using the recovery country as the dependent variable for theft incidents in Chula Vista, California, a city located only miles from the busiest road border crossing connecting the U.S. to Mexico.

BACKGROUND

The first piece of legislation aimed toward curbing vehicle trafficking was the Dyer Act of 1919. Rather than focusing on international commerce, the Dyer Act was constructed to restrict inter-state trafficking of vehicles (Richburg 1984). During the 1980s and 1990s, news media reported on a new form of crime that was occurring at seaports (for examples, see Dauler 1994; Robles 1996) and land borders (for examples, see Abrams 1988; Bauder 1996; LePage and Romero 1990): the international exportation of stolen vehicles. Based on media reports and expert testimony, the federal Motor Vehicle Theft Law Enforcement Act of 1984 targeted all forms of professional MVT through the initiation of a vehicle identification number (VIN) parts-marking program. Eight years later, the federal Anti-Car Theft Act of 1992 enacted stiffer punishments for participation in vehicle trafficking. Taken together, these two pieces of legislation signaled a growing concern about professional MVT in the U.S., including both domestic chop shops and international exporting.

Concerns about vehicle thefts demonstrated by media coverage and federal legislation are supported by Uniform Crime Report (UCR) MVT trends. By 1995, border area states, such as Arizona and California, had MVT rates far higher than national averages (United States Department of Justice 1996). While states in the northeast experienced sharp decreases in MVT during the 1990s and 2000s, the declines were more modest in the southwest. In the 2010 Uniform Crime Report, Arizona (336.5 per 100,000 population) and California (409.4 per 100,000 population) had two of the highest MVT rates (United States Department of Justice 2011). In response to the growing issue, several states on the U.S.-Mexico border have developed specific initiatives to address the problem. For instance, Texas created the Border Auto Theft Information Center in the Department of Public Safety in 1994 (Aldridge 2007). In California, task forces were formed in many cities and counties targeting MVT (California Highway Patrol). Although empirical research has not adequately assessed the success of these initiatives, the legislative and departmental concerns about MVT are indicative of the scope of vehicle trafficking in the southwestern U.S.

LITERATURE REVIEW

Clarke and Brown (2003) cite several factors that facilitate vehicle trafficking operations including legitimate commerce, low priority, and corruption. Increasingly, international borders, such as the U.S.-Mexico border, are vital to the local economy of border area cities. Thousands of legitimate vehicles travel across the border on a daily basis. The effort to distinguish stolen vehicles from other border crossing vehicles is a formidable task for authorities. MVT is not considered a high law enforcement border priority in comparison to other transnational issues such as human, drug, and firearm trafficking (Clarke and Brown 2003). Importantly, exporting syndicates commonly work in conjunction with corrupt officials (Clarke and Brown 2003; Miller 1987) to ensure that stolen vehicles successfully reach Mexico. Low pay and a lack of oversight breed corrupt activities and relationships with exporters.

Miller (1987), the first researcher to study vehicle trafficking along the U.S.-Mexico border, described the presence of organized "frontera" groups. Although the groups were described as varying in size and scope, their presence was identified in many Texas border area cities. About a decade later, Resendiz's (1998) interviews with 10 active vehicle thieves operating along the Texas-Mexico border found several roles in the exportation process. Specifically, a "chauffer" shops for vehicles and transports specialists; "specialists" break into vehicles; and "mounters" are responsible for crossing the U.S border. Additionally, special populations appear to perform particular acts. For instance, Resendiz (2001) found that females often play the "chauffer" role, while Richardson and Resendiz (2006) express that juveniles are assets in the process of stealing cars because of the lack of punishment when they are caught and arrested.

There is some debate about whether most forms of cross-border trafficking are more similar to organized crime syndicates or networks of crime entrepreneurs. Miller (1987) describes vehicle trafficking groups at the U.S-Mexico border as relatively organized and often sophisticated. Richardson and Resendiz (2006) divide participants in the process into two different categories: those who supplement other incomes with profits and those who make a living off of the crime. In Resendiz's (1998) ethnographic study, the researcher found relationships and groups to be fluid with little structure and organization. Consequently, Resendiz (1998) stated that these findings were not consistent with a form of organized crime.

Research has also examined which vehicles are targeted for exporting. Miller's (1987) initial work identified lines of Buicks, Chevrolets, Chryslers, Dodges, Fords, Mercurys, and Volkswagens as the most desired vehicles. Specifically, models that were manufactured in

Mexico, were labeled as high-risk targets. Field, Clarke and Harris (1991) tested Miller's hypothesis using insurance data and found support for the argument. Later, Resendiz (1998) found newer models from General Motors, Ford, and Chrysler to be in greatest demand in Texas. In San Diego County, California, Plouffe and Sampson (2004) reported very low recovery rates for particular models, including Toyota Camrys and Toyota trucks, which indicate a presence of exporting operations for these models. In total, studies on vehicle targets show differences across manufacturer and model, but these distinctions have been somewhat inconsistent.

Also central to the current research are studies that consider the spatial and temporal factors that impact vehicle trafficking. Distance to the border is a variable often tested in predicting increased likelihood of exporting incidents. In a national study, Roberts (2012) identified distance to borders as a predictor of professional thefts in major U.S. cities. Another study found that cities in Texas closer to the Mexican border had lower recovery rates than cities further north (Gallahan 1997). Within San Diego County, California, Plouffe and Sampson (2004) showed that areas in northern portions of the county had substantially higher recovery rates than areas in southern parts of the county, which signals the role of professional, cross-border operations. Locations closer to the U.S.-Mexico border are generally at greater risk for professional MVT than locations further away.

Some researchers (Clarke and Brown 2003; Miller 1987) have argued that vehicle traffic volume is a major element facilitating illegal border crossings; however Resendiz (1998) found that thieves prefer to cross the border during times with less vehicle traffic. Miller's (1987) research discovered that commuter traffic was a major factor in facilitating illegal crossings. Further, it has been argued that corruption within Mexican law enforcement agencies is responsible for the ease with which vehicles move into Mexico (Clarke and Brown 2003; Gallahan 1997; Miller 1987). In contrast, Resendiz's (1998) research found that it is more common for thieves to outrun Mexican authorities than to bribe them. These studies have produced inconclusive results about when vehicles are most often stolen for exporting purposes and moved across the border.

A review of stolen vehicle trafficking literature reveals that studies on MVT in the border region are sparse. Further, most studies relating to the patterns and characteristics of this crime were conducted before the mid-2000s. As a transnational crime, the nature of vehicle exporting has likely changed substantially since much of this research was conducted. The dearth of recent studies creates a need for contemporary work that assists in understanding the current state of the problem.

THEORETICAL FRAMEWORK

The study of specific crimes, such as MVT across land borders, is supported under the area of environmental criminology. Environmental theories of crime depart from other perspectives that explain variation in criminal behavior through psychological, biological, and social factors. While other theories often portray criminals and non-criminals in two separate, distinct groups, environmental criminology assumes that most people have the potential to offend. Rather than focusing on differences between individuals or groups of people, theories considered as environmental approaches focus on criminal opportunities and the effect of environmental influences on offender decision-making.

Central to the main themes of environmental criminology, and most specifically, the rational choice perspective is the analysis of crime-specific patterns. Proponents of crime-specific research criticize other theories for lumping several forms of crime into broad categories such as "crime," "property crime," or "burglary." Clarke and Cornish (1985) argue that it is necessary to make distinctions within traditional law enforcement categories of crime. They note that there are several different forms of burglary, vandalism, robbery, rape, and fraud, among other crimes. Analysis of crime-specific categories then leads to more focused explanations of offender behavior and, subsequently, crime prevention measures.

The crime of MVT has been the subject of much research in environmental criminology. Several factors contribute to the evolving nexus of MVT and environmental approaches to the study of crime including the availability of quality data, the multi-dimensional nature of MVT, and the link with prevention. Based on reporting rates higher than most other crimes, MVT data from law enforcement, victim surveys, and insurance agencies provide several potential sources for researchers to apply varied approaches. Further, perhaps more than any other law enforcement crime category, MVT can be categorized more clearly into subgroups based on the offender's intent (e.g. joyriding, chopping or stripping, exporting). The study of specific forms of MVT assists environmental criminologists in understanding not only MVT, but criminal decision-making as a whole. Additionally, studies using an environmental criminology approach commonly arrive at conclusions that can be realistically implemented, ranging from shifts in resource deployment to advances in security.

METHOD

Data for the present research were provided by the Chula Vista Police Department in Chula Vista, California. Chula Vista, located in the southern portion of San Diego County, has a population of approximately 250,000 people. Of the 100 largest U.S. cities, Chula Vista is located closest to the San Ysidro border crossing. The city contains three highways (Interstate 5, Interstate 805, and State Route 125) that lead toward two border crossings. Chula Vista was chosen as the site to study vehicle trafficking based on the detail of data maintained by the Chula Vista Police Department and the city's geographic proximity to major U.S.-Mexico border crossings.

***Figure 1.* Incorporated Cities and Towns in San Diego County**

All completed MVT incidents that took place in the city, from January 1, 2005 until December 31, 2007, were included in the sampling frame. This 3-year period was selected because consistent, comparable data had not been collected for all previous years. More recent data were not utilized to allow time for vehicle recovery.

Dependent Variable

Possible outcomes of MVT incidents include a final recovery status of "recovered domestically," "recovered internationally," and "unrecovered." The total number of thefts in Chula Vista from 2005 until 2007 was 7,039. Of these total thefts in Chula Vista, there were 3,804 vehicles recovered in the U.S., 364 recovered in Mexico, and 2,771 that remained unrecovered. These statistics equate to an overall recovery rate of 59.2 percent and a domestic recovery rate of 54.0 percent. For this study, "unrecovered' cases are not included in the analysis because there is no method for accurately identifying which of the "unrecovered" incidents were actually exported. All vehicles that were stolen in Chula Vista and recovered in Mexico from 2005 to 2007 (N=364) are compared to a random sample (n=364) of the 3,804 incidents that were stolen in Chula Vista and recovered domestically in the U.S. A random numbers generator was used to select the 364 domestically recovered incidents for inclusion in this study.

Independent Variables

The independent variables utilized in this study are grouped into three categories: vehicle, spatial, and temporal factors. Several of these variables have been included in previous research (vehicle manufacturer, vehicle type, vehicle value, vehicle age, and distance to the border), while others are tested for the first time in this study (vehicle owner residence jurisdiction, distance to the highway, day of week, and time of day). Five independent variables measure properties and characteristics of the vehicle. The effect of vehicle manufacturer on international demand for stolen vehicles has been proposed in previous MVT studies (Herzog 2002; Miller 1987; Plouffe and Sampson 2004; Resendiz 1998). "Vehicle manufacturer" is categorized here into seven groups: Chevrolets, Dodges, Fords, Hondas, Nissans, Toyotas, and Others. The six manufacturers included in the model are the most commonly stolen in the total sample. Based on previous findings on international vehicle trafficking, it is predicted that there will be significant differences for "vehicle manufacturer" for vehicles recovered in Mexico compared to those recovered in the U.S.

Vehicle type is another variable considered influential in exporting stolen vehicles (Miller 1987; Resendiz 1998). Here, vehicle type is broken down into six categories: 2-door cars, 4-door cars, vans, sport-utility vehicles, pick-up trucks, and other vehicles that do not fit into the categorization, such as commercial vehicles. Studies on vehicle exporting have suggested that there is variation in which vehicle types are stolen for export in the U.S. (Miller 1987) and the U.K. (Clarke and Brown 2003).

Two continuous variables relate to the properties of the vehicle and its attractiveness. The vehicle's worth is assessed by the Kelley Blue Book value for trade-in at "good" condition. Kelley Blue Book analyzes market transactions to provide estimates of prices of used vehicles in various conditions. The values from Kelley Blue Book are widely considered to be the most comprehensive estimates available. Other MVT studies that have included vehicle value have used figures based on victim or law enforcement estimates (Tremblay, Talon and Hurley 2001), which may be subject to bias or exaggeration. Stolen goods market values do not necessarily mirror the prices of legitimate markets. In some cases, vehicles are valued higher outside the U.S. based on a lack of availability. Tremblay and colleagues' (2001) findings indicate that vehicles stolen for export are more expensive than those stolen for other purposes in Canada. This is the first study known to the researcher to use an independent source to assess stolen vehicle value.

Vehicle age is measured by subtracting the year when the vehicle was stolen from the year it was manufactured (Herzog 2002; Tremblay, Talon and Hurley 2001). In Tremblay and colleagues' (2001) study, vehicles that were stolen for export in Canada were newer than those stolen for other reasons. Inclusion of the variables vehicle age and vehicle value allow the researcher to test whether vehicles recovered domestically differ from those recovered internationally on these variables. The final vehicle-related variable, labeled "vehicle owner residence" is a dichotomy based on whether or not the vehicle is registered in the city of Chula Vista. While this variable has not been included in previous research, it can be expected that professional vehicle thieves may target vehicles owned by local residents who demonstrate predictable patterns. Conversely, professionals might seek out vehicles from out-of-town owners who are unfamiliar with the area.

Two independent variables measure the spatial dimension of international vehicle trafficking. Similar to several other studies on MVT (Gallahan 1997; Plouffe and Sampson 2004; Roberts 2012; Roberts and Block 2012) the distance to the border in road miles is included in the analysis. In other research, distance to the border has been a predictor of professional forms of MVT (Gallahan 1997; Plouffe and Sampson 2004; Roberts 2012; Roberts and Block 2012). As Clarke and Brown (2003) mention, vehicles can be stolen and taken across the border before the vehicle is reported as stolen if the distance is relatively close. Distances from the southernmost and northernmost points to the border within Chula Vista range from four to 14 miles.

The second spatial variable is the distance in road miles to the nearest highway entrance of the three north-south highways that flow toward the Mexican border. Highways serve as a facilitator for quick and undetectable access to border crossings, however highway access may also be attractive to joyriders. Both spatial variables are calculated utilizing the TravelGIS website (www. travelgis.com), which uses Natural Area Codes to identify

Table 1. **Definitions and Coding Scheme for Dependent and Independent Variables**

Variable	Coding
Recovery Location (Dependent)	Recovered in U.S. = 0, Recovered in Mexico = 1 (Dichotomous)
Vehicle Manufacturer	Manufacturer of stolen vehicle classified into one of seven groups (Chevrolet, Dodge, Ford, Honda, Nissan, Toyota, Other) (Categorical)
Vehicle Type	Type of vehicle classified into one of six groups (2-Door, 4-Door, Van, SUV, Truck, Other) (Categorical)
Vehicle Value	Value, in thousands of dollars, of vehicle at time of theft based on Kelley Blue Book's "good" trade-in value (Continuous)
Vehicle Age	Number of years since manufacture at time of theft (Continuous)
Vehicle Owner Residence (VOR)	Vehicle registered outside of Chula Vista = 0, Vehicle registered in Chula Vista = 1 (Dichotomous)
Border Distance	Distance in road miles to the nearest of two border crossings to Mexico (Continuous)
Highway Distance	Distance in road miles to the nearest highway entrance to North-South highways (Continuous)
Time	Daytime thefts = 8am to 759pm, Nighttime thefts = 8pm to 759am, Unknown = Overlapping time periods (Categorical)
Day	Weekday thefts = Monday through Thursday, Weekend thefts = Friday through Sunday, Unknown = Overlapping time periods (Categorical)

precise traveling distances between any two points in the world. Previous studies have not included measures of accessibility to highways.

Conflicting findings exist about temporal patterns of MVT for export. In this study two temporal variables are included in models. The time of day is dichotomized into thefts occurring during the day (0800am-0759pm) and night (0800pm-0759am) following time frames applied by Shaw, Smith and Bond (2010). A third "unknown" category contains cases in which vehicles are reportedly stolen in a time frame that includes both day and night periods. For instance, if a "start" time for an incident is 5a.m. and the "end" time is 11a.m., the case would be categorized as "unknown." Similarly, the day of the week of theft is divided between weekday (Monday-Thursday) and weekend (Friday-Sunday) thefts. Vehicles stolen in an overlapping time period across the day categories are classified as "unknown." Because there is often a lag between the time of the offense and the time the victim becomes aware of the crime, a large percentage of cases fall into unknown categories for both temporal variables. Table 1 presents the coding scheme for the dependent variable and each of the nine independent variables in this study.

Table 2. **Descriptive Statistics for Independent Variables**

	N	Mean or %	St. Dev	Min	Max
Manufacturer	717				
Chevrolet	86	12.0%			
Dodge	26	3.6%			
Ford	129	18.0%			
Honda	130	18.1%			
Nissan	80	11.2%			
Toyota	63	8.8%			
Other	203	28.3%			
Type	728				
2-Door	114	15.7%			
4-Door	314	43.7%			
Van	37	5.1%			
SUV	104	14.3%			
Trucks	138	19.0%			
Other	21	2.9%			
Value	690	6.60	6.05	.23	48.70
Age	728	7.52	5.70	0	43
VOR	728	.68	.46	0	1
Border Dist.	716	7.96	1.73	4.00	13.10
Highway Dist.	716	1.32	.87	.10	4.90
Time of Day	728				
Day	206	28.3%			
Night	217	29.8%			
Unknown	305	41.9%			
Day of Week	728				
Weekday	365	50.1%			
Weekend	276	37.9%			
Unknown	87	12.0%			

Analytical Strategy

Based on the binary dependent variable that is formed by comparing vehicles recovered in Mexico to vehicles recovered in the U.S., logistic regression models are constructed. Using logistic regression to make a distinction between different groupings of MVT follows Herzog's (2002) study of MVT in Israel. Correlations were run for each of the independent variables to determine if there were multicollinearity problems. The strongest relationships between independent variables were between vehicle age and value (r=.70), and weekday and weekend thefts (r=.78), signifying that all proposed independent variables could be included in the model.

Variance inflation factors (VIFs) were all below 3. The primary aim of the logit model is to determine which predictor variables are influential in differentiating between exported stolen vehicles and non-exported vehicles originating in Chula Vista.

RESULTS

Table 2 presents descriptive statistics for the total sample in Chula Vista. Seventeen incidents in which the vehicle was recovered in Mexico and 32 vehicles recovered in the United States were not included because of insufficient data. In most cases there was a lack of information about the precise location where the incident took place or the vehicle's manufacturer and model. The dropped cases only represent 6.7 percent of the original sample. After cases with inadequate data were dropped, 347 exported incidents and 332 non-exported incidents are included for a total of 679 cases. For vehicle manufacturer, Hondas account for 130 (19.1%) of the 679 incidents in the sample, while 129 (19.0%) stolen vehicles were Fords. The "other" category, consisting of 33 manufacturers, included 214 (31.5%) thefts. The most common type of vehicle to be stolen was the 4-door car (n=302, 44.5%). The average assessed value of stolen vehicles was $6,600 and the mean age was 7.52 years (SD=6.05). About 68.7 percent (SD=.46) of vehicles in the sample were registered in Chula Vista.

The average distance to the border from the point of theft was 7.96 road miles (SD=1.73), while the average distance to the closest highway entrance was 1.32 road miles (SD=.87). The vehicles in the sample were slightly more likely to be stolen at night (29.8%) than during the day (28.3%) when the time of day is known. Yet the largest grouping in this categorization is the "unknown" category. Just over half (n=343, 50.5%) of vehicles were classified as weekday thefts.

***Table 3*. Logistic Regression Coefficients Predicting Vehicle Recovery Location for Chula Vista Vehicle Thefts, 2005-07 (N=679)**

	Model 1			Model 2		
	B (SE)	OR	p.	B (SE)	OR	p.
Chevrolet (ref=Honda)	-.11(.37)	.893	.759	-.15 (.37)	.861	.689
Dodge	.53 (.52)	1.706	.305	.48 (.53)	1.620	.359
Ford	-.11(.34)	.895	.743	-.07 (.34)	.937	.850
Nissan	-.08(.33)	.922	.806	-.09 (.34)	.917	.797
Toyota	-.37(.39)	.693	.353	-.42 (.40)	.656	.292
Other Manufacturer	.04(.28)	1.037	.896	.01 (.29)	1.009	.976
2-Door (ref=4-door)	-.68(.26)	.507	**.009**	-.67 (.27)	.511	**.012**
Van	-.02(.40)	.982	.964	.06 (.41)	1.066	.876
Sport-Utility Vehicle	.70(.30)	2.018	**.019**	.72 (.31)	2.054	**.019**
Pick-up	.49 (.27)	1.638	.067	.59 (.28)	1.804	**.034**
Other Type	-2.07(1.11)	.126	.063	-1.77 (1.11)	.170	.109
Value	.04(.03)	1.035	.163	.04 (.03)	1.038	.138
Age	-.13(.03)	.878	**.000**	-.13 (.03)	.878	**.000**
VOR	.00(.19)	1.001	.997	-.04 (.19)	.961	.838
Border Distance				-.10 (.06)	.906	.072
Highway Distance				.02 (.11)	1.020	.855
Night (ref=day)				-.12 (.24)	.889	.626
Unknown Time				.28 (.23)	1.319	.220
Weekend(ref=weekday)				-.18 (.19)	.839	.360
Unknown Day				.25 (.29)	1.281	.390
Chi-Square	162.78	p=.000		169.34	p=.000	
CoxR2	.210			.218		
-2 Log Likelihood	793.48			786.92		

Note: Significant Relationships at 95 percent confidence highlighted in bold

Table 3 presents the coefficients, standard errors, and odds ratios in the binary logistic regression models. Model 1 contains only vehicle-related variables, while Model 2 includes all vehicle, spatial, and temporal variables. In Model 1, vehicle age is a significant predictor of recovery country. Each additional vehicle year decreases the likelihood of recovery in Mexico versus the U.S. by 12 percent (p=.000). SUVs were recovered in Mexico more often than 4-door vehicles (p=.009), while 2-door vehicles were more commonly recovered in the U.S. (p=.019). None of the other vehicle-related variables are significant in Model 1 at 95 percent confidence.

In the full model, Model 2, only vehicle-related predictors are statistically significant. For vehicle type,

both sport-utility vehicles (OR=2.05, p=.019) and pick-up trucks (OR=1.80, p=.034) were 105 percent and 80 percent, respectively, more likely to be recovered in Mexico than in the United States when compared to the reference category of 4-door vehicles. Conversely, 2-door vehicles were 49 percent less likely than 4-doors (OR=.51, p=.012) to be recovered in Mexico than in the U.S. Vehicle age is the strongest predictor of recovery country in the model. For each additional year of age, vehicles were 12 percent less likely to be recovered in Mexico compared to the U.S. (OR=.88, p=.000). Other vehicle characteristics including each vehicle manufacturer variable, vehicle value, and vehicle owner residence are not statistically significant.

None of the spatial and temporal variables are found to be significant predictors of vehicle recovery country at the 95 percent confidence threshold in Model 2. The variable measuring distance to the Mexican border is significant at only 90 percent confidence (p=.072). The "distance to highway" variable is not a significant predictor of recovery location. Additionally, temporal variables for "time of day" and "day of week" are also not significant predictors of the dependent variable. In total, both models are similar in explanatory power and the addition of spatial and temporal variables do not change the vehicle characteristic relationships.

DISCUSSION

The findings from this study continue along the path of research differentiating between forms of MVT (Clarke and Harris 1992; Herzog 2002; Roberts 2012; Roberts and Block 2012; Tremblay et al. 1994). More research has examined joyriding (Kellett and Gross 2006; McDonagh, Wortley and Homel 2002; O'Connell 2006) than other professional types of theft, such as exporting. Yet, the lasting negative effects of this type of theft, such as obtaining a replacement vehicle and the illegal use of the stolen vehicle, warrant serious inquiry toward its patterns and subsequent prevention measures.

Consistent with previous findings (Miller 1987), there are notable differences found here between vehicles stolen for export and vehicles stolen for domestic use. Foremost, vehicles stolen in Chula Vista and recovered in Mexico are more likely to be SUVs and pick-up trucks. There are several possible interpretations of this finding. First, although the data is not available in this analysis, it is possible that SUVs and trucks are stolen for export most because they are more common in Mexico and will blend in with the vehicle fleet. This explanation is similar to the logic of Miller (1987) and Field et al. (1991), stating that vehicle models manufactured and found in Mexico would be stolen for export in the U.S. A second explanation is that SUVs and pick-up trucks are better suited for the rough terrain in Mexico. Unpaved or poorly maintained roads in Mexico increase the demand for such vehicles. Third, as vehicle trafficking can be tied to other forms of cross-border trafficking, such as the movement of people (Miller 1987; Petrossian and Clarke 2012), drugs (Miller 1987; Petrossian and Clarke 2012), or firearms, SUVs and trucks are more useful than smaller vehicles for moving large amounts people and contraband back across the border. If vehicles are stolen for purposes of facilitating other forms of organized crime, this finding would serve as a strong justification to increase focus on vehicles leaving the U.S., which is not currently a high priority (Clarke and Brown 2003; Petrossian and Clarke 2012). The vehicle-specific findings noted in this study relate closely to Plouffe and Sampson's (2004) argument that the rational choice perspective's focus on reasonable decision-making is taking place.

There are also strong relationships found for the variable of vehicle age. There is evidence that thieves moving vehicles across the border target much newer vehicles than domestic thieves. This finding indicates that uses in Mexico are likely not limited to cross-border trafficking, but also personal use. Both older and newer large vans, SUVs, and pick-up trucks would likely suffice for cross-border operations. The suggestion that amateur thieves are stealing older cars may also reflect the role of immobilizers that are more commonly found on newer vehicles. Several international evaluations have found that vehicle immobilizers decrease MVT (Brown 2004; Farrell, Tseloni and Tilley 2011; Potter and Thomas 2001), but many of the findings have shown that immobilizers deter amateur thieves more than professionals. Professional thieves who are responsible for bringing many of the vehicles illegally across the U.S.-Mexico border do not appear to be deterred by the forms of security found on many of the vehicles built after the year 2000. However, amateur thieves seem to target older vehicles that are likely not equipped with immobilizers or which have very early versions of immobilizing technology. Another possible explanation for the significant findings for the "age" variable is related to the role of "chop shops." While most vehicles stolen for chopping are considered to be professional-oriented and rarely recovered, many of the 3,804 vehicles recovered in the U.S. are likely linked to "chop shops." Thieves targeting vehicles for chopping are more likely to steal older vehicles with older parts that are desirable in illegal markets, although research on chop shop operations is lacking. The "age" variable is further complicated by permanent importing restrictions on vehicles manufactured outside of Mexico (Petrossian and Clarke 2012). Complex legislation passed in Mexico greatly reduces the legal import of both new and old vehicles to protect the Mexican automobile industry and address concerns about harmful emissions. While there is no evidence that these laws substantially impact illegal exporting, the extensive limitations do present a possible confounding explanation for these findings.

Other studies including vehicle value have found mixed results linking professional forms of theft to higher vehicle values. This variable was not significant in the multi-variate model, but was a statistically significant predictor of vehicle recovery location in bi-variate analyses (not shown).

Neither of the two spatial variables included in this analysis are significant predictors. Most notably, distance to the border is not a significant predictor differentiating between the two forms of MVT. This finding establishes a preliminary threshold in which distance plays a role in cross-border theft operations. Each MVT within Chula Vista was committed within 15 miles of a border crossing. The lack of significant findings suggests that thieves are willing to travel this distance to export vehicles, while Plouffe and Sampson (2004) found stark differences in recovery rates between the southern and northern portions of San Diego County. Other studies also concluded that distance to borders influences trafficking in the U.S. (Gallahan 1997; Roberts 2012; Roberts and Block 2012) and in international settings (Herzog 2002). Therefore, these results indicate that within cities along the border, distance is not as important as in county, state, or national analyses. Based on the current research and previous studies, traffickers appear willing to consistently travel between 5 and 15 miles to steal and export a car, but not 50 to 100 miles.

Policy Implications

Based on the overall vehicle theft population in Chula Vista, there is strong evidence that international vehicle trafficking trends identified in other studies (e.g. Plouffe and Sampson 2004) have not subsided. Of the 4,168 recovered vehicle thefts, nearly 9 percent of those recoveries occurred in Mexico. Considering that these recoveries only represent a portion of exported stolen vehicles, in addition to unrecovered vehicles that are not returned, hundreds of vehicles are being exported illegally on a yearly basis from this one border city alone. When these numbers are extrapolated to other areas, the statistics suggest that estimates from the NICB and other studies (Block et al. 2011) are correct in stating that trafficking to Mexico remains a problem.

The city of Chula Vista has consistently had the lowest recovery rates in San Diego County (Plouffe and Sampson 2004). Chula Vista and other similar cities near the Mexican border face unique challenges in preventing MVT that require assistance and partnerships involving multiple agencies and organizations. For instance, the San Diego County Regional Auto Theft Task Force (RATTF), established in 1992, consists of agents from police and probation departments, representatives from insurance agencies, and attorneys. The San Diego County RATTF is responsible for assisting in apprehending and prosecuting MVT cases. Similar organizations exist in other border areas in Arizona and Texas. The RATTF participates in undercover investigations, Vehicle Identification Number etching programs, and developing relationships with communities. In addition to the RATTF, state and local law enforcement agencies collaborate in prevention and recovery measures.

The findings in this study contain policy ramifications for such regional task forces, local police agencies, and other persons responsible for crime prevention. Along the U.S.-Mexico border, vehicle-related factors appear to be more influential than spatial and temporal factors for international vehicle trafficking. If international thefts are deemed to be more harmful than vehicles that are normally recovered in the U.S. and returned to owners within a shorter time frame, police departments along the border should focus on recently manufactured sport-utility vehicles and pick-up trucks. Additionally, MVT prevention requires the attention of vehicle owners and communities, in addition to law enforcement. Petrossian and Clarke (2012) note that one proposed response to vehicle exporting across land borders is to distribute newsletters and flyers about the crime. They add that such campaigns could focus on increasing awareness for owners of these vehicles. These interventions build upon components of awareness campaigns described by Barthe (2004) and Copes and Cherbonneau (2006) by publicizing the vehicles that are at highest risk for permanent theft, particularly in areas such as Chula Vista. By focusing on high-risk vehicle types for exportation, owners of these vehicles should be more likely to take the initiative to increase surveillance and security of their vehicles. These campaigns increase the difficulties of MVT, and, according to Petrossian and Clarke (2012), vehicle-specific campaigns have experienced moderate success in Australia.

There is no evidence from this study that there are consistent temporal patterns in existence for vehicle trafficking incidents. The lack of significant findings for the “time of day” and “day of week” variables shows that vehicle thieves in Chula Vista who move vehicles across the border maintain similar temporal patterns as thieves who steal vehicles for domestic use. The descriptive statistics show that slightly less than half of incidents in which the MVT time is known occur during the day time hours. This null finding is noteworthy because Miller (1987) previously asserted that organized rings worked during business hours, while Resendiz (1998) found both day and night thefts. The contemporary circumstances in Chula Vista are most closely matched to Resendiz’s (1998) findings, showing that vehicles recovered in Mexico are not stolen at different times than the vehicles recovered in the U.S. Initiatives that focus on increasing resources based on the time of day or day of week should reassess the approach.

Theoretical Implications

The findings in this study can be interpreted theoretically by applying components of the rational choice perspective. According to the rational choice perspective, offenders often seek to increase rewards associated with crime while seeking to minimize risks and effort. However, we know very little about whether specific offenders and patterns of criminality reflect a focus on one of these dimensions over the others. Perhaps some types of criminals focus on increasing rewards without extensive concern about increasing their chances of apprehension or making the process more difficult and time-consuming. Conversely, other criminals are most focused on simply minimizing effort and risk with less concern placed on the rewards of their offense.

Based on the results of this study, the vehicles that are being stolen for export purposes are vehicles that are newer and more useful for certain specific purposes (i.e. trafficking, resale, managing terrain). By identifying vehicle-choice differences in patterns of forms of MVT offending, we observe that thieves likely do consider the primary rewards. In many cases, the effort to steal these vehicles is actually greater, because the offenders must bypass or defeat more advanced forms of vehicle immobilizers and other types of vehicle security equipped on recently produced vehicles. Further, based on the spatial and temporal variables in the study, the thieves taking vehicles to Mexico are not stealing the vehicles significantly closer to border crossings and highway access points. They are also not stealing the vehicles at different temporal points than thieves who are operating for domestic purposes. While this study makes no effort to support or reject the core principles of the rational choice perspective, the findings can be interpreted as preliminary support for studying the particular motivations associated with the theory.

Limitations

The main limitations of this study are related to measurement issues capturing vehicle trafficking incidents. The methodology in the study assures that each MVT case was correctly classified; a large number of cases are not included, because their status was unresolved as an "unrecovered" theft. These unrecovered cases account for 46 percent of all Chula Vista MVT incidents. Undoubtedly, some of these thefts in Chula Vista were actually destined for Mexico or other international locations. It is not clear whether the export cases that are recovered are representative of all exporting incidents, including those which are unrecovered. Further, some of the significant findings in this study may relate to qualities of recovery rather than actual differences between exported and non-exported thefts. For instance, sport-utility vehicles and trucks are larger and more identifiable which can lead to an increase in the chances of recovery in Mexico. However, Rice and Smith (2002) cite an unpublished study finding that police behavior only influences about 3 percent of recoveries. If the role of law enforcement is similarly minimal for international recoveries, this limitation is less of a concern. The variables measuring space and time of the theft incident are likely not influenced by characteristics of the recovery process. Future improvements to this methodology rely upon access to currently unobtainable forms of data such as border traffic cameras that document all vehicle crossings from the U.S. into Mexico rather than relying on recovery data alone.

A related issue is the complex nature of the vehicle recovery process. The findings in the study may be affected by differences in the process of reclaiming stolen vehicles internationally and domestically. In the U.S., law enforcement agencies may spot stolen vehicles or rely on recovery devices that are equipped on vehicles. When vehicles are stolen and taken across international boundaries there are several methods of possible recovery. Bilateral treaties between the U.S. and Mexico mandate that vehicles noticed by Mexican authorities are returned to the U.S. Citizens may also play a role if they find their own vehicles that have been exported to Mexico. Increasingly, recovery systems such as Lojack have become more capable on both sides of the border. U.S. authorities, such as state law enforcement and task forces work with other agencies to investigate claims where vehicles are suspected to have been taken to Mexico. The different aspects of the recovery process may affect the variables in this study, because the domestic and international processes are not identical.

Another limit to this work is the focus on data only in Chula Vista, California. There are several other areas with high theft rates along the border in parts of southern Texas, southern Arizona, and southern California. In San Diego County alone, cities such as San Diego, Oceanside, Carlsbad, and Escondido likely contribute to stolen vehicles that enter Mexico through San Ysidro crossing. As Miller (1987) explains, the organization and characteristics of MVT participants can vary by location. Future quantitative and qualitative studies in other locations along the U.S.-Mexico border, such as Laredo and El Paso, Texas, and Nogales, Arizona, would add to our understanding of the topic.

CONCLUSION

A central component to several criminological theories, mainly those falling within environmental criminology, is that research should be crime-specific (Clarke and Felson 2004). The findings in this study support the continuation of crime-specific research. As home burglaries are different than commercial burglaries and bank robberies are different from ATM robberies, MVT is also best understood when intent and motivation

are taken into consideration. In this instance, offender decision-making of thieves operating across the U.S.-Mexico border is different than the decision-making of thieves working domestically.

The research findings show that characteristics of U.S. vehicles recovered in Mexico are significantly different than vehicles that remain in the country. The vehicles recovered in Mexico are more likely to be larger vehicles such as sport-utility vehicles and pick-up trucks. Additionally, younger vehicles are recovered in Mexico more often than in the U.S. While none of the spatial and temporal variables in the study differentiated between vehicles recovered in Mexico and the U.S., vehicles stolen closer to the border crossings were more likely to be recovered in Mexico using 90 percent confidence intervals.

Considering the wide-ranging effects, the lack of public concern and academic attention toward international vehicle trafficking is troublesome. This oversight is partially caused by the even distribution of negative outcomes across insured vehicle owners. MVT insurance companies assure that owners will not suffer the same financial losses that they would incur if other uninsured property was targeted (Field 1993). However, all insured vehicle owners and other members of the community are financially and physically threatened by stolen vehicles, the ways that they are driven (Copes and Tewksbury 2011; Halsey 2008; Kellett and Gross 2006; Marshall, Boyd and Moran 1996; O'Connell 2006), and the strong links with other forms of crime (Herzog 2002; McCaghy, Giordano and Henson 1977; Miller 1987). These secondary costs of vehicle crimes warrant increased attention to better understand the patterns associated with each individual form of MVT.

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