THE RELATIONSHIP BETWEEN THE PRESENCE OF A PARTNER AND THE OCCURRENCE OF ACCIDENTS DURING THE POLICE PURSUITS

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ABSTRACT

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The subject of one- versus two-officer units in police patrol unit has been controversial over the years. As the majority of research indicates, one-officer units in police patrols have been believed to be more effective, efficient, and safer than the two-officer units. However, when the one- versus two-officer unit controversy is combined with police pursuits, it becomes an unanswered question. Although, there has been much research on both the one- versus two-officer unit staffing problem and the police pursuit separately, there has been no study on the effect of the presence of a partner during the police pursuits. This thesis was undertaken to examine the relationship, which might exist between the presence of a partner and the occurrence of accidents during the police pursuits. No significant relationship between those two variables was found in this study. However, it is recommended further studies be conducted to assure the findings in this thesis.

Dedicated to my family

My wife, Hyojeong,

And my two children, Hyunji and Youngseok.

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CHAPTER 1

INTRODUCTION

There have been many controversies over the issue of one- officer versus two-officer patrol units. When police administrators decide whether to use one-officer or two-officer police patrols, policing effectiveness, efficiency, and officer safety seem to be the primary concerns.

Traditionally, one-officer units have been favored by police administrators for the reason that the single officer unit strategy doubles the police cars available for a given manpower level (Chelst, 1979; Decker & Wagner, 1982; Kaplan, 1979; Kessler, 1985). Consequently, the single officer unit strategy has been considered to increase police visibility, time spent on preventive patrol, and the average area covered by patrol. On the other hand, two-officer units have been favored for the reason of officer safety. With few empirical data to support, two-officer patrol units are believed to be safer than the one-officer patrol units (Wilson, & Brewer, 1992:452).

Kaplan (1979) revealed that the probability of officer-specific injury is roughly the same for one- and two-officer staffing based on evaluation of one-versus two-

officer patrols. Therefore, when police administrators decide between one-officer and two-officer units, if all other conditions are same, it is natural that they will prefer one-officer units to two-officer units for the reasons of the police visibility and the officer safety.

However, when it comes to the police pursuit, which is one of the important operations of the police patrol unit, police administrators have to consider the suspects safety, public safety, and police officer safety. According to Kaplan's (1979) study, the probability of officers being injured during the patrol shift is roughly the same for both of the one- and two-officer patrol units. However, police pursuit has the potential danger to the public and the suspects , as well as, police officers themselves. Whether the probability of the public and suspects' getting injured is same or different for one- and two- officer patrol units during the police pursuit is not known.

The views toward police pursuit seem to be divided. One view of pursuit is that all police pursuit driving is hazardous and unnecessary so that it should be prohibited and abolished (Payne & Corley, 1994). The other view is that police pursuit is necessary for police to protect and serve their community and to maintain order. The proponents of the former emphasize the statistics regarding

accidents that police pursuits have caused to support their view. In order to provide a more convincing basis for maintaining police pursuit as one of important police operations, thorough examination of safety matters during the police pursuits is necessary. Therefore, if the presence of a partner affects the accident rates during the police pursuit, police administrators have to give more consideration to the police officer staffing strategy regarding police pursuits.

Statement of the Problem

There has been a great deal of research on the subject of one- versus two-officer patrol units concerning police effectiveness, efficiency, and officer safety. However, there has not been so much attention to the police pursuit problem combined with patrol units. As one of the important police patrol operations, the police unit staffing strategies may have significant effects on the police pursuit if rates of accidents that occurred as results of police pursuit are subject to the different police patrol unit staffing. Research on the one- versus two- officer police patrol units seems to pay much attention to officer's safety when they mention the problem of safety. However, accidents during the police pursuit can cause serious damage not only to the police officers'

safety but also to the safety of third parties and suspects. Therefore, if one- and two-police patrol units have significantly different accident rates during the police pursuit, police administrators have to consider those results as an important factor, along with police effectiveness, efficiency, and officer safety, to their decision on the police patrol unit staffing strategies.

Purpose of the Paper

The purpose of this thesis is to evaluate the relationship, if any, which exists between the presence of a partner in police vehicles during pursuit driving and the difference in accident rates. Although there has been a great deal of research on the one-versus two-officer patrol unit staffing strategies and the police pursuit policies, there was no specific study on the relationship between those two subjects. At this point, the study on the relationship between those two subjects seems to be necessary. If there is any relationship between accident rates and the presence of a partner during the police pursuit, the finding of that relationship can provide an opportunity to reconsider the police pursuit policies. Furthermore, this study can hopefully provide a new viewpoint toward the problem of one- versus two-officer patrol unit staffing strategies.

Delimitation

This study consisted of an analysis of data from the Michigan Emergency Response Study (MERS) data set collected by Payne (1992). The survey was conducted to the Michigan State Police between June 23, 1991 through May 31, 1992 to have general information on the police pursuit in Michigan State Police. Those data collected were used to analysis of this study.

The contemporary research concerning evaluation of the one-versus two-officer patrol units staffing strategies and the problems of police pursuits were reviewed in literature review.

The Chi-square independence test was conducted to examine the relationship between the presence of a partner and the occurrence of accidents. Secondary data from Michigan Emergency Response Study (MERS) were used for this analysis.

The limits in this thesis are sampling and the inherent problem of secondary data. The sample size was limited only to 352 cases. With any statistical test, it is more likely to reject the null hypothesis with large samples than with small samples in Chi-square test (Bachman, & Paternoster: 310). Therefore, with a bigger size of samples, the test result may be different. The

data used here is secondary data. In other words, the variables in this data set were not operationalized for specific measurement of relationship between the presence of a partner and the occurrence of accidents. Therefore, there is potential validity problems in this thesis.

Hypothesis

It is hypothesized that the presence of a partner during the police pursuit may affect the police performance. The occurrence of accidents during the pursuits was used for measuring the police performance.

The data set includes two primary variables contained in the hypothesis statement. The independent variable is the presence of partner during the police pursuits. The dependent variable is the occurrence of accidents during the police pursuits. The null hypothesis is tested against the alternative hypothesis using Chi-square independence test.

Null hypothesis

There is no significant relationship between the presence of a partner during the police pursuit and the occurrence of accidents

Alternative hypothesis

There is a significant relationship between the presence of a partner during the police pursuit and the occurrence of accidents

CHAPTER 2

LITERATURE REVIEWS

One-versus two- officer patrol unit staffing

In 1977, the first study on the subject of one-versus two- officer units staffing strategy was published using data from San Diego (Boydstun, Sherry, and Moetler, 1977). These researchers found that one- officer cars were safer and more efficient than two- officer patrol unit cars. After the San Diego study, a great deal of research on the subject of one- versus two- officer units began to emerge. Almost all studies on the police patrol unit staffing were focused on the matters of effectiveness, efficiency (cost and benefit), and officer safety.

In 1979, Kaplan evaluated the effectiveness of one-officer versus two-officer patrol units. He focused on issues surrounding one- versus two- officer patrol units staffing arguments such as problems of 1) expected area covered by patrol, 2) response time from the nearest vehicle to a randomly occurring incident, 3) expected frequency of patrol, 4) visibility of patrol, 5) probability of intercepting a randomly occurring crime in progress, 6) probability of officer injury, and 7) comparative costs. He found that 1) the coverage

increases almost twice when the number of units doubles in a beat; 2) a switch to one-officer units will increase patrol frequency, consequently, bring about an increase in visibility; 3) officer-specific injury is roughly the same for one- and two-officer staffing; 4) the cost for one- and two-officer unit are equal.

Chelst (1981) studied the performance of one-officer and two-officer patrol units in terms of travel time. He compared the travel times of one- and two- officer units under two different dispatch operations. The first model is the usual beat system that the dispatcher does not know the precise location of the police units. The second model is a dispatch operation that is supported by an automatic vehicle monitoring system (AVM). He categorized calls into calls that require only one-officer cars (Type 1) and calls that require two-officer cars (Type2). Under first model, one-officer patrol units showed 30 % less travel time than two-officer units in Type 1 calls. Two-officer cars demonstrated advantages in Type 2 calls. Under the second model, one-officer units showed consistent time savings in both types of calls. Generally, one-officer patrol units were more effective than two-officer units in terms of travel time in Chelst's (1981) study.

Green and Kolesar (1984) conducted a similar study to Chelst (1981) and found similar results in New York City.

Kessler (1985) examined the subject of one- versus two- officer units staffing concerning the response time. He found that two one-officer cars respond more quickly than one two- officer car. According to Kessler's study, there are no grounds to believe that the two-officer car is more effective than one- officer car unit in terms of response time.

Decker and Wagner. (1982) studied the impact of one- and two-officer patrol units on police-citizen interactions. They examined the difference between one- and two-officer units in the rate of injuries to police officers, in the rate of citizen complaint injuries, in the number of resisting arrests by the citizens, and in the type of charge against the citizen in the incidents. According to their study, the injury rate was similar to both of the one- and two- police patrol units. The injury rate was not significantly different between the one- and two- police patrol units, even after controlling shift variable and the dangerousness variable. Concerning complaint outcomes, they found that hostile police- citizen interactions are more likely to result in citizen injury when two officers are present. This finding implies that

two- officer units rely more on the violent method to solve the hostile interactions.

Through the studies on the one- versus two-officer patrol units, one- officer units seem to be favored for the reasons of effectiveness, efficiency, and officer safety.

Police pursuit

Police pursuit has long been an important method of police operations to keep social order. Nugent et al. (1990) defined police pursuit as:

> An active attempt by a law enforcement officer on duty in a patrol car to apprehend one or more occupants of a moving motor vehicle, providing the driver of such vehicle is aware of the attempt and is resisting apprehension by maintaining or increasing his speed or by ignoring the officer's attempt to stop him

According to this definition, police pursuit is an extension of police patrol activities. It is an active attempt by a law enforcement officer on duty in a patrol car. Moreover, according to Payne and Fenske (1996), the majority of pursuits was initiated for traffic violations. In other words, the majority of police pursuits can be said

to be initiated during ordinary police patrol activities. Therefore, when police administrators consider patrol staffing, it would be more desirable for them to speculate on the problems that might be derived from police pursuits. One of those problems derived from police pursuits is an accident. An accident during a police pursuit can cause serious damage to the police organizations as well as the public. If accidents during the police pursuit has a certain relationship with the presence of a partner in police patrol unit, police administrators should take this relationship into consideration when they decide the number of police officers in a police patrol unit.

As Scafe and Round (1979) said, "a pursuit is justified only when the necessity of immediate apprehension outweighs the level of danger created by the pursuit" (Scafe and Round, 1979: 37). In other words, the police pursuit cannot be justified when the necessity of immediate apprehension does not outweigh the level of danger created by the pursuit. However, it is difficult to judge whether a police pursuit has enough reason to be believed to have outweighing necessity of immediate apprehension over the level of the danger created by the pursuit. Consequently, there have been many disputes over the police pursuit. Those disputes have been expressed in civil liability

lawsuits, hostile publicity in the media, and negative public opinions over the years. These factors have brought much pressure on police administrators to implement more reasonable policies regarding police pursuits in their organizations. However, according to Auten(1990)'s study, 20.6 % of all police agencies in his study did not have any written guidelines regulating their officers' activities during the police pursuit. Furthermore, Auten found that even the police agencies which had written policies on the police pursuit had some serious gaps in their policy statement. Concerning the pursuit policies, Britz and Payne (1994) also pointed out the lack of supervision and communication between supervisors and patrol officers in police pursuits. Homant and Kennedy (1994) examined the effect of policies on pursuits. They rated states according to how restrictive a state's pursuit policy is. They compared the pursuit tendencies of police officers in participating states. They found that in the state with the most restrictive policy, the number of pursuits per officer is less than half of that in the state with the most permissive pursuit policy.

Almost all research on accidents during the police pursuit seem to be focused on the rates of the police pursuits which ended in the accidents, the seriousness of

the accidents, the objects of the accidents, the factors which caused the accidents, and the pursuit policy.

The Physicians for Automotive Safety (1968) estimated that 20 % of all pursuits ended in death, while 70 % ended in injuries. However, they lacked empirical evidence for those results, because they relied only on three months of newspaper clippings as their data. These negative results reflect the misunderstanding and the hostile mood by the public against the police pursuits. Those negative views against police pursuits changed after the California Highway Patrol Study.

The California Highway Patrol Study (1983) analyzed 683 reported police pursuits from police agencies in Southern California. They found that 29 % of police pursuits resulted in accidents, 11 % of them caused injuries, and only 1 % of them caused fatality.

Alpert and Dunham (1989) examined the predictors of accidents during the police pursuit. They analyzed seven variables which contributed significantly to the prediction of accidents by the police pursuits: "officer's age, reason for pursuit, road conditions, officer's gender, the officer's ethnicity, time of day, and type of road."(Alpert et al., 1989:529). They found:

1) Officers 40 years of age or older are less likely to end pursuits in accidents than officers less than 40 years old.
2) Slightly more accidents occurred if the pursuit was initiated for the traffic reasons than other reasons.
3) If the roadways are wet, there is a greater possibility of accidents than when the pursuit is conducted on the dry roadways.
4) Male officers are more likely to end in accidents during the pursuit than female officers.
5) There is little difference between accident rates of Caucasian officers and non Caucasian officers during pursuit.
6) Pursuits conducted in daytime caused more accidents than pursuits in other times.
7) Pursuits on the freeway are less likely to end in accidents than on the other roads

Payne and Fenske (1996) conducted an analysis on accident injuries and fatalities during police pursuits in Michigan. They compared the result of that analysis to the general population injury and fatality rates. They found that "the pursuit accident injuries occur at significantly higher rates than the general population's experience". However, they found that "…fatal accident

rate was not significantly higher than the Michigan general population rates". They proposed that "the police administrators should seriously consider restrictive policies, closer supervision of pursuits and enhanced pursuit driving training with an emphasis on accident avoidance"(Payne, & Fenske, 1996:111).

There have been many studies on both the evaluation of one- versus two- officer patrol units staffing and the police pursuits separately. However, there was no specific study on the combination of these two topics. If either one- officer patrol unit staffing or two- officer patrol unit staffing affects accident rates, that factor must be included in the police pursuit policy consideration.

CHAPTER 3

METHODOLOGY

This chapter is dedicated to outline the methodology conducted in this study. This includes the data set, the design of Michigan Emergency Response Study(MERS), samples, variable categories, and the way the data was analyzed.

Data set

The data set in this study was originally collected by Payne (1992) for the study of emergency response in Michigan. The basis for these data was a survey called Michigan Emergency Response Study (MERS) phase II, which was conducted to the Michigan State Police between June 23, 1991 through May 31, 1992.

The design of MERS phase II

MERS Phase II is divided into three parts, and consisted of 58 questions. Part one consisted of questions designed to collect environmental information and police respondents' demographic information regarding all emergency drivings. Part two consisted of questions designed to collect data relating to pursuits. Part three was designed to record pursuit accident data. The data set is the result of a 58-question direct mail with return addressed, stamped envelope to the researcher.

Respondents were asked to mail responses directly to the researcher without any official channel to avoid any bureaucratic pressure. The survey was anonymous and respondents were not asked to identify themselves or their work stations.

The sample

The survey questionnaires were administered to 2220 sworn officers of the Michigan State Police. The survey was completed by 1293 officers in the field. Among those completed cases, 352 cases, which were identified with the police pursuits, were used to examine the relationship between the presence of partner and the occurrence of accidents during the police pursuits. Officers' ages were between 18 to 51 or more. 31% of officers were between 26 and 30 years old. Concerning officers' gender, 91.2%of officers who completed this survey were male officers. Officers' ethnicity was consisted of five categories. Among officers who completed this survey, 89.5% of them were Caucasians, 3.4% of them were African Americans, 1.4% of them were Asians, .9% of them were Hispanics, and .6% of them were Native Americans.

Variable categories

Of the 58 questions in the survey, five categories of variables were selected for analysis. The variables were categorized: (1) the presence of a partner, (2) the occurrence of an accident, (3) the most serious injury to police, (4) the most serious injury to a third party, and (5) the most serious injury to the suspect(s). The variable, the presence of a partner was coded into two categories, yes and no. Respondents were asked if there was a partner in vehicle during the police pursuits. The variable, the occurrence of an accident was also coded into yes and no. Respondents were asked if an accident occurred during the police pursuits. The variable, the most serious injuries to police, third party, and suspects were coded into 4 categories: none, minor, serious, and fatal. The independent variable is the presence of a partner during the pursuits and the dependent variable is the occurrence of an accident.

Data Analysis

Crosstabultion was used to find the relationship between the independent variable and the dependent variable. The Chi-square test of independence was conducted as a method of analysis of data to determine if the variables are independent or related, because both the

independent variable and the dependent variable are nominal. The SPSS(Statistical Pack for Social Science) program was used to conduct this Chi-square test.

CHAPTER 4

FINDINGS

This chapter will examine the hypothesis to find out whether there is a relationship between the presence of a partner during the police pursuits and the occurrence of accidents

Partners during the police pursuits

Table 1 shows how many officers responded that there was a partner and how many officers responded that there was no partner during the police pursuits. Of all 352 respondents, 209 (59.4%) answered there was a partner during the police pursuits, and 140 (39.8 %) answered there was no partner during the pursuits. Three cases were missing (.9%).

Table 1

Presence of Partner during the police pursuit

	Frequency	Percent
Yes	209	59.4
No	140	39.8
Missing	3	.9
Total	352	100

Accidents during the police pursuits

Table 2 indicates the frequencies and percentages of accident occurrence during the police pursuits. Of all 352 police pursuits, only 58(16.5%) cases ended in accidents and 283(80.4%) pursuits didn't caused accidents. 11(3.1%) of the respondents didn't answer for this question.

Table 2

Did an accident occur during the pursuit

	Frequency	Percent
Yes	58	16.5
No	283	80.4
Missing	11	3.1
Total	352	100

Table 3 indicates how many and how seriously police officers were injured in the accidents which occurred during the police pursuits. Of all 58 respondents who answered accidents occurred during the pursuits, 50 (86.2%) answered no injuries to police officers, 7 (12.1%) reported minor injuries to police officers, and only one (1.7%) reported serious injury. No fatal injury was caused to the police officers during the police pursuits.

Table 3

Injury to police officers

	Frequency	Percent
None	50	86.2
Minor	7	12.1
Serious	1	1.7
Fatal	0	0
Total	50	100

Table 4 indicates how many and how seriously the suspects during the police pursuits were injured. Of all respondents who reported that the accidents occurred during the police pursuits, 41(70.6%) answered there were no injuries to suspects, 14(24.1%) answered the suspects had minor injuries, and 3(5.1%) answered serious injuries were caused during the police pursuits. No fatal injury was caused to the suspects during the police pursuits.

Table 4

Injury to suspects

	Frequency	Percent
None	41	70.6
Minor	14	24.1
Serious	3	5.1
Fatal	0	0
Total	58	100

Table 5 indicates how many and how seriously 3rd party during the police pursuit were injured. Of the 58 cases which ended in accidents, 50(86.2%) were accidents with no injuries to 3rd party, 7(12.1%) were accidents with minor injuries to 3rd party, and 1 (1.7%) fatal to 3rd party. No serious injuries were caused to the 3rd party during the police pursuits. Among all three groups, only to 3rd party, fatal injury was caused. However, this number has no significant meaning statistically.

Table 5

Injury to 3rd party

	Frequency	Percent
None	50	86.2
Minor	7	12.1
Serious	0	0
Fatal	1	1.7
Total	65	100

From these findings, the suspects group appears to be most vulnerable to injuries during the police pursuits than police and 3rd party groups.

Hypothesis test

Table 6 indicates the relationship between the presence of a partner and the occurrence of accidents during the police pursuits. 11 cases of 352 cases were deleted (pairwise deletion), because the accident variable has 11 missing cases. Of the 202 officers who answered that there was a partner during the police pursuits, 37 officers (18.3%) reported there was an accident during the pursuits while 165 officers (81.7%) reported no accident. Among the 139 officers who answered there was no partner during the pursuits 21 officers (15.1%) reported there was an accident while 118 officers (84.9%) reported no accident

during the police pursuits. Slightly more accidents occurred when there was a partner in vehicle than when there was no partner during the police pursuits. The presence of a partner during the pursuits appears to be related to more accidents than single officer with a simple comparison of numbers

Table 6

The relationship between the presence of a partner and occurrence of accidents

	The presence of partner								
	Yes		No		Total		X^2	Sig.	Ø
	n	%	n	%	n	%			
Accidents							.601	.438	.042
Yes	37	18.3	21	15.1	58	17.0			
No	165	81.7	118	84.9	283	83.0			
Total	202	100	139	100	341	100			

Note. n = number of cases; % of cases; x^2 = Chi-square; (Sig.)= significance level; Ø= Phi Coefficient

Table 6 also indicates that the chi-square value was used to determine whether having a partner in police vehicle during the police pursuits and the occurrence of the accidents are related. The Chi-square value in this test is .601. This value is too small to reject the null

hypothesis. In order to reject the null hypothesis with a significance level of .05 and a degree of freedom of 1, the Chi-square value must be 3.841 or greater than that. Therefore, the null hypothesis that there is no relationship between the presence of the partner and the occurrence of accidents during the police pursuits was accepted. The presence of the partner and the occurrence of accidents during the police pursuits appear to be independent events.

Hypothesis test controlling officers' demographic factors

Chi-square tests were conducted to examine the relationships between the presence of a partner and the occurrence of accidents controlling officer's demographic factors. Control variables are officer's age, gender, and ethnicity.

Table 7 indicates the relationship between the presence of a partner and the occurrence of accidents during the police pursuits when controlled by the officers' age. Chi-square value of age group of 31-45 is significantly greater than the value that is needed to reject the null hypothesis with significance level of .05.

Table 7

The relationship between the presence of a partner and occurrence of accidents controlling the officers' age

Officer' Age			Presence of partner: Yes	No	X^2	Sig.	Ø
18-20	Accident	Yes	0	0			
		No	1	0			
		Total	1	0			
21-25	Accident	Yes	4	3	.070	.791	.043
		No	16	15			
		Total	20	18			
26-30	Accident	Yes	14	8	.035	.851	.018
		No	51	32			
		Total	65	40			
31-35	Accident	Yes	15	5	6.870	.009	.330
		No	17	26			
		Total	32	31			
36-40	Accident	Yes	3	2	.657	.417	-.108
		No	39	12			
		Total	42	14			
41-45	Accident	Yes	1	1	.158	.691	-.051
		No	37	21			
		Total	42	14			
46-50	Accident	Yes	0	2	.800	.371	-.258
		No	3	7			
		Total	3	9			
51 or more	Accident	Yes	0	0			
		No	1	5			
		Total	1	5			
N = 341		Total	202	139			

Note. x^2 = Chi-square; (Sig.)= significance level; Ø= Phi Coefficient

And the Phi value for this significant relationship is .330. This means these two variables are related with moderately low strength.

All other age groups except for age group 31-35, show no significant relationship between the presence of partner and the occurrence of accidents. However, age group 26-30 and age group 31-35 that have cells with at least 5 cases or more show that the presence of a partner during the pursuits caused more accidents than a single officer car.

Table 8 indicates the relationship between two variables controlling officer's gender. Chi-square values for the male group is bigger than the female group. However, the Chi-square value for the male group is not large enough to reject the null hypothesis: there is no relationship between the presence of a partner and the occurrence of accidents during the police pursuits. The relationship between the partner and accidents variables was not found when controlled with officer's gender. However, in table 8, for both the male and female group, accident rate for pursuit with a partner is slightly bigger than the single officer cars.

Table 8

The relationship between the presence of a partner and occurrence of accidents controlling officers' gender

Officer's gender			Presence of partner: Yes	No	X^2	Sig.	Ø
Male	Accident	Yes	35	19	.536	.464	.041
		No	154	105			
		Total	189	124			
Female	Accident	Yes	2	2	.024	.877	.029
		No	11	13			
		Total	13	15			
		Total	202	139			

Note. x^2 = Chi-square; (Sig.)= significance level; Ø= Phi Coefficient

Table 9 indicates the relationship between the presence of partner and the occurrence of accidents when controlled with officer's race.

As table 9 shows, White and Black groups have relatively high Chi-square value. However, neither of these values is large enough to reject the null hypothesis.

Table 9

The relationship between the presence of a partner and occurrence of accidents controlling the officers' race

Officer's race			Presence of partner: Yes	No	X^2	Sig.	Ø
White	Accident	Yes	33	18	1.151	.283	.061
		No	146	112			
		Total	179	130			
Black	Accident	Yes	0	2	2.40	.121	-.447
		No	6	4			
		Total	6	6			
Hispanic	Accident	Yes	1	0	.750	.386	.386
		No	1	1			
		Total	2	1			
Asian	Accident	Yes	0	0			
		No	4	1			
		Total	4	1			
Native American	Accident	Yes	0	0			
		No	2	0			
		Total	2	0			
		Total	193	138			

Note. x^2 = Chi-square; (Sig.)= significance level; Ø= Phi Coefficient

Through the hypothesis test controlling age, gender, and race, only age factor showed significant relationship in age group of 31-35. One problem here with these control groups is sample size. There were cells with less than 5 counts in all of three groups. Therefore, further research is recommended with more reliable sample size.

Chi-square independence tests conducted here indicate that there is no relationship between the presence of a partner and the occurrence of accidents during the police pursuits, except for the age group of 31-36. However, in almost all cases, there appears to be more accidents when there is a partner during the police pursuits than when there is no partner present. Although, there is a lack of statistical evidence, it is worth while to pay attention to the fact that there were more accidents when there is a partner in vehicle during the police pursuits.

CHAPTER 5

CONCLUSION

There was no significant relationship between the presence of a partner and the occurrence of accidents according to the Chi-square independence test conducted in this thesis. However in most cases, there were more accidents when there was a partner in vehicle during the police pursuits, even though no significant relationship was supported. It can be reasoned that: 1) a police officer who drives the vehicle can be distracted by the presence of a partner, while a single officer can concentrate on driving during the pursuits, 2) there can be a kind of escalation of emotions against suspects among officers when there is a partner during the pursuits. In many types of citizen-police interactions, "one-officer units were less likely to escalate the level of confrontation of already hostile situations"(Decker, & Wagner, 1982: 381). Therefore, it can be inferred that police officers act with same manner during the police pursuits as they do in other ordinary police activities. Consequently, police officers react to the suspects with more hostile attitude when there is a partner in vehicle during the police pursuits. Those hostile and escalated

attitudes can be attributed to more occurrences of accidents when there is a partner during the police pursuits.

Two implications were found in this thesis. First, although no relationship between these two variables was found, this is the first study that examined the relationship between the presence of a partner and the occurrence of accidents during the police pursuits. The sample size was limited only to 352 cases and to the state of Michigan. Especially in Chi-square independence test, the results can be different according to the sample size. The result in this thesis can hardly be generalized because the data are collected only in State of Michigan. Furthermore, the data used here is secondary data. For the reason of the fact that the data used here is not invented for the specific measurement of the relationship between the presence of a partner and the occurrence of accidents, this thesis might have potential possibility of validity problems. With a bigger sample size, different method of sampling and more precise operationalization, a different outcome is possible.

Second, as Dunham et al. (1998) indicated, the police, the suspect, and the public constitutes an interactive triangle of pursuit. In other words, a negative outcome

from police pursuits is not the result of police operation only. An accident during the police pursuits is not an exception from this. Therefore, the research considering all these three factors is recommended in order to analyze more precise relationship between the presence of a partner and the occurrence of accidents.

In spite of all these limits, it was worthwhile to operationalize and test the hypothesis that the presence of a partner during the police pursuits might affect the accident rate, because this hypothesis may, hopefully, provide additional viewpoint toward police patrol units staffing strategies with further studies on this topic.

APPENDIX

EMERGENCY RESPONSE STUDY
GENERAL INSTRUCTIONS

CATEGORIES FOR DIFFERENT TYPES OF RESPONSES

For purposes of this survey, in order to classify the type of run you were on, please use the following categories:

1. **Pursuit:** Offender was obviously attempting to elude the police by increasing speed and/or taking other evasion action. Those circumstances that require emergency lights and sirens whether you used them or not. **USE STANDARD FORM FOR THIS CATEGORY**

2. **Response to Alarm:** Nature of the alarm is such that the officer considered it necessary to drive at speeds in excess of the limit. An example might be responses to silent alarms. **USE STANDARD FORM FOR THIS CATEGORY**

3. **Medical Emergency:** Speeds driven in excess of the limit based on a decision of the officer that the natures of call is such that he/she feels it is an emergency requiring speed, lights, and siren. Examples include: A serious injury accident, poisoning, attempted suicide, heart attack, etc. **USE STANDARD FORM FOR THIS CATEGORY**

4. **Crime(s) in Progress:** Those crimes or responses to complaints in which officer obtained information leading to his/her conclusion, based on policy or training, that the circumstances require an emergency response utilizing emergency equipment. This category may also include silent-run situations for the latter part of the run or officer in trouble calls. **USE STANDARD FORM FOR THIS CATEGORY**

5. **High Speed Driving:** This category is not a pursuit, but one in which an officer attempts to overtake a vehicle that was observed at a speed in excess of the limit or in a manner which requires police to drive at a speed in excess of limit in order to take enforcement action. This may include pacing, closing the gap, or overtaking a vehicle to take enforcement action, but not using emergency equipment until the actual stop is made. **USE THE SHORT FORM FOR THIS CATEGORY.**

PART I

This part is general demographic information that will assist in determining the depth, scope and nature of such police activities. The questions are constructed to avoid identification of any officer or specific location in Michigan. Michigan State Police districts are used to identify geographical differences, traffic patterns, and general population densities.

All respondents answer Questions 1-27 of this Part unless your report is a Category 5(Driving in Excess of the Limit). In those cases only, use the Short Form.

PART II

Pursuits: Answer questions 28-52 if your answer to Question #1, Part I is Pursuit.

PART III

This part of the survey relates to accidents. Answer questions 53-58 if an accident occurred.

IMPORTANT: USE ONLY #2 OR #2.5 PENCIL TO COMPLETE QUESTIONNAIRE.

Next Page Please

STANDARD SURVEY FORM

PART I: General Information: Categories 1-4

IN RESPONSE TO THE FOLLOWING QUESTIONS FILL IN CIRCLE NEXT TO THE NUMBER OF THE MOST APPROPRIATE ANSWER FOR THE PARTICULAR CATEGORY. **PLEASE FILL IN ONLY ONE CIRCLE.** ANSWER QUESTIONS 1through 27 FOR ANY OF THE 4 CATEGORIES CHOSEN.

1. Type of run
   - o 1. Pursuit
   - o 2. Response to Alarm
   - o 3. Medical Emergency
   - o 4. Crime in Progress

2. Type of Police
   - o 1. State
   - o 2. Sheriff
   - o 3. Township
   - o 4. City
   - o 5. Village
   - o 6. University
   - o 7. Federal
   - o 8. Other

3. Region of State (MSP District)
   - o 1. 1st
   - o 2. 2nd
   - o 3. 3rd
   - o 4. 4th
   - o 5. 5th
   - o 6. 6th
   - o 7. 7th
   - o 8. 8th

4. Day of week
   - o 1. Sunday
   - o 2. Monday
   - o 3. Tuesday
   - o 4. Wednesday
   - o 5. Thursday
   - o 6. Friday
   - o 7. Saturday

5. Time of day initiated
   - o 1. 12:01-3:00 AM
   - o 2. 3:01-6:00 AM
   - o 3. 6:01-9:00 AM
   - o 4. 9:01-12:00 noon
   - o 5. 12:01-3:00 PM
   - o 6. 3:01-6:00 PM
   - o 7. 6:01-9:00 PM
   - o 8. 9:01-12:00 midnight

6. Road type: Most of run
   - o 1. Freeway
   - o 2. State Turnpike
   - o 3. County Road
   - o 4. Township Road
   - o 5. City Street
   - o 6. Trail (Two Track)
   - o 7. Alley
   - o 8. Other

7. Number of lanes: Most of run
   - o 1. 2 lanes
   - o 2. 3 lanes
   - o 3. 4 lanes: Not divided
   - o 4. 4 lanes: With side streets
   - o 5. 4 lanes: Express way
   - o 6. 5 or More lanes: Express way
   - o 7. Other

8. Road surface: Most of run
   - o 1. Concrete
   - o 2. Black top
   - o 3. Paved: Other
   - o 4. Gravel: Coated
   - o 5. Gravel: Not coated
   - o 6. Sand

9. Road level: Most run
   - o 1. Even
   - o 2. Rough and Rolling
   - o 3. Patched

10. Road direction
   - o 1. Straight
   - o 2. Winding
   - o 3. Few Curves

11. Type of area
   - o 1. Urban
   - o 2. Suburban
   - o 3. Rural
   - o 4. Unpopulated

12. Estimate time of run (in minutes)
   - o 1. Less than 1
   - o 2. 1-3
   - o 3. 4-6
   - o 4. 7-9
   - o 5. 10-12
   - o 6. 13-15
   - o 7. 15 or more

13. Estimate distance of run (in miles)
   - o 1. 1 or less
   - o 2. 2
   - o 3. 3
   - o 4. 4
   - o 5. 5
   - o 6. 6
   - o 7. 7
   - o 8. 8
   - o 9. 9 or more

14. Highest speed driven (closest)
   - o 1. 40 or less
   - o 2. 50
   - o 3. 60
   - o 4. 70
   - o 5. 80
   - o 6. 90
   - o 7. 100
   - o 8. 105 or more

15. Light conditions
   - o 1. Dawn
   - o 2. Daylight
   - o 3. Dusk
   - o 4. Dark

16. Weather
   - o 1. Clear
   - o 2. Rain
   - o 3. Snow
   - o 4. Fog
   - o 5. Freezing Rain
   - o 6. Cloudy

17. Police unit: Type
   - o 1. Marked
   - o 2. Semi-marked
   - o 3. Unmarked
   - o 4. Motor-Cycle

18. Overhead light operating
   - o 1. Yes
   - o 2. No
   - o 3. As needed

19. Siren operating
   - o 1. Yes
   - o 2. No
   - o 3. As needed

20. Police driver: Age
- o 1. 18-20
- o 2. 21-25
- o 3. 26-30
- o 4. 31-35
- o 5. 36-40
- o 6. 41-45
- o 7. 46-50
- o 8. 51 or more

21. Police driver: Seniority in years
- o 1. Probation
- o 2. 1-3
- o 3. 4-5
- o 4. 6-10
- o 5. 11-15
- o 6. 16-20
- o 7. 21-24
- o 8. 25 or more

22. Police driver: Gender
- o 1. Male
- o 2. Female

23. Partner in vehicle?
- o 1. Yes
- o 2. No

24. Police driver race
- o 1. White
- o 2. Hispanic
- o 3. Black
- o 4. Asian
- o 5. Native American

25. Supervisor's Location
- o 1. In vehicle with officer
- o 2. In general area
- o 3. At station
- o 4. Other location
- o 5. Off duty

26. Highest posted speed during run
- o 1. 15
- o 2. 25
- o 3. 30
- o 4. 35
- o 5. 40
- o 6. 45
- o 7. 50
- o 8. 55
- o 9. 65

27. Did an accident occur during run?
- o 1. Yes
- o 2. No

PART II: PURSUIT QUESTIONS

IF YOU CHECKED #1 AS PURSUIT (CATEGORY #1) PLEASE ANSWER QUESTIONS 28-52. IF THERE WAS NO PURSUIT, BUT THERE WAS AN ACCIDENT GO TO QUESTION #53 AND CONTINUE.

28. Reason pursuit initiated
- o 1. Speed
- o 2. Other Traffic Violation
- o 3. OUIL
- o 4. Misdemeanor: Suspected
- o 5. Misdemeanor: Known
- o 6. Felony: Suspected
- o 7. Felony: Known
- o 8. Other

29. Est. distance from suspect at start
- o 1. 1-50 ft.
- o 2. 100 ft.
- o 3. 200 ft.
- o 4. 300 ft.
- o 5. 500 ft.
- o 6. 1 / 2 mi.
- o 7. 3 / 4 mi.
- o 8. More

30. Closest to suspect: During run
- o 1. 1-50ft.
- o 2. 100ft.
- o 3. 200ft.
- o 4. 300ft.
- o 5. 500ft.
- o 6. 1 / 2 mi.
- o 7. 3 / 4 mi.
- o 8. More.

31. Police unit
- o 1. Primary car
- o 2. Back up car
- o 3. Other

32. Was Dispatch Notified?
- o 1. Yes
- o 2. NO

33. During pursuit was it possible to obtain suspect vehicle license number?
- o 1. Yes
- o 2. No

34. Number of occupants in suspect's vehicle (including driver)
- o 1. One
- o 2. Two
- o 3. Three or more

35. Could you estimate age of suspect?
- o 1. Yes
- o 2. No

36. Age of primary suspect
- o 1. Less than 15
- o 2. 15-20
- o 3. 21-25
- o 4. 26-30
- o 5. 31-35
- o 6. 36-40
- o 7. 41 or more
- o 8. Unknown

37. Gender of primary suspect
- o 1. Male
- o 2. Female
- o 3. Unknown

38. Was suspect under influence?
- o 1. Yes-Alcohol
- o 2. Yes-Drug
- o 3. Unknown
- o 4. No

39. Race of suspect driver
- o 1. White
- o 2. Hispanic
- o 3. Black
- o 4. Asian
- o 5. Native American
- o 6. Unknown

40. Suspect vehicle: Type
- o 1. Passenger
- o 2. Van
- o 3. Wagon
- o 4. Truck(including pick-up)
- o 5. Sport
- o 6. Motor Cycle
- o 7. Tractor/ Trailer
- o 8. Other

41. Reason pursuit terminated
- o 1. Officer's decision
- o 2. Supervisor's decision
- o 3. Suspect surrendered
- o 4. Suspect apprehended
- o 5. Suspect escaped
- o 6. Suspect in accident
- o 7. Officer in accident
- o 8. Other

42. Official action taken
- o 1. Arrest: OUIL
- o 2. Citation: Released
- o 3. Arrest: Fleeing & Eluding
- o 4. Arrest: Misdemeanor
- o 5. Arrest: Felony
- o 6. License revoked
- o 7. License suspended
- o 8. No operators license

43. Suspect boxed-in?
- o 1. Yes
- o 2. No

44. Suspect rammed?
- o 1. Yes
- o 2. No

45. Road block used?
- o 1. Yes
- o 2. No

46. Aircraft used?
- o 1. Yes
- o 2. No

47. Number of police vehicles involved
- o 1. One
- o 2. Two
- o 3. Three or more

48. Number of vehicles pursued
- o 1. One
- o 2. Two
- o 3. More

49. Did suspect run stop sign?
- o 1. Yes
- o 2. No
- o 3. Not applicable

50. Did suspect run red light?
- o 1. Yes
- o 2. No
- o 3. Not applicable

51. Did suspect turn off headlights?
- o 1. Yes
- o 2. No
- o 3. Not applicable

52. Did suspect drive wrong way?
- o 1. Yes
- o 2. No

PART III: ACCIDENT QUESTIONS.
IF AN ACCIDENT RESULTED FROM THE RUN YOU ARE REPORTING, PLEASE ANSWER QUESTIONS 53 THROUGH 58.

53. Type of vehicles in accident
- o 1. Police only
- o 2. Suspect only
- o 3. Police and suspect
- o 4. Police, suspect and 3rd party
- o 5. Police and 3rd party(s)
- o 6. Suspect and 3rd party(s)

54. Number of vehicles in accident
- o 1. One
- o 2. Two
- o 3. Three
- o 4. Four
- o 5. Five
- o 6. Six or more

55. Most serious injury to police
- o 1. None
- o 2. Minor
- o 3. Serious
- o 4. Fatal

56. Most serious injury to suspect(s)
- o 1. None
- o 2. Minor
- o 3. Serious
- o 4. Fatal

57. Most serious injury to 3rd party(s)
- o 1. None
- o 2. Minor
- o 3. Serious
- o 4. Fatal

58. Were pedestrians injured?
- o 1. One
- o 2. Two
- o 3. Three or more
- o 4. No

THANK YOU FOR YOUR COOPERATION

PER INSTRUCTIONS
PLACE COMPLETED SURVEYS IN COLLECTION CONTAINER
FOR RETURN TO THE RESEARCHER

If you have any questions feel free to contact
Dennis M. Payne (517) 353-5482 or Terry Nerbonne (616) 592-2836

REFERENCES

Alpert, G., & Dunham, R. G. (1989). Policing hot pursuits: The discovery of aleatory elements. The Journal of Criminal Law & Criminology, 80, (2), 521-539.

Auten, J. (1990, November). An analysis of police pursuit policy. Law and Order, 38,.(11), 53-54.

Bachman, R., & Paternoster, R. (1997). Statistical methods for criminology and criminal justice. New York: McGrow-Hill.

Boydstun, J. E., Sherry, M. E., & Moelter, N. P. (1977). Patrol staffing in San Diego: One- or two officer units. Washington: Police Foundation.

Britz, M. T., & Payne, D. M. (1994). Policy implication for law enforcement pursuit driving. American Journal of Police, 13, (1), 113-142.

California Highway Patrol, (1983). California Highway Patrol Pursuit Study. Sacramento:, CA.

Chelst, K, R. (1981). Deployment of one-vs. two-officer patrol units: A comparison of travel times. Management Science 27, (2), 213-230.

Decker, S. H., & Wagner, A. E. (1982). The impact of patrol staffing on police-citizen injuries and dispositions. Journal of Criminal Justice, 10, 375-382.

Dunham, R. G., Alpert, G. P., Kenny, D. J., & Cromwell, P. (1998). High-speed pursuit: The offender's perspective. Criminal Justice and Behavior, 25, (1), 30-45.

Green, L., & Kolesar, P. (1984). The feasibility of one-officer patrol in New York City. Management Science, 30, 964-980.

Homant, R. J., & Kennedy, D. B. (1994). The effect of high-speed pursuit policies on officer's tendency to pursue. American Journal of Police, 13, (1), 91-111.

Kaplan, E. H. (1979). Evaluating the effectiveness of one-officer versus two-officer patrol units. Journal of Criminal Justice, 7, 325-355.

Kessler, D. A. (1985). One-or two-officer cars? A perspective from Kansas City. Journal of Criminal Justice, 13, 49-64.

Nugent, H., E., Edwards, T. McEwen, and L. Mayo (1990). Restrictive Policies for High-Speed Police Pursuits. Washington, DC: U.S. Department of Justice.

Payne, D. M., & Corley, C. (1994). Police Pursuits: Correlates of the failure to report. American Journal of Police, 13, (4), 47-71.

Payne, D. M., & Fenske, J. (1996). An analysis of the rates of injury and fatal accidents in Michigan State Police

Pursuits: A Michigan Emergency Response Study. American Journal of Police, 15, (4), 95-116.

Physicians for Automotive Safety (1968). Rapid pursuit by the police: Causes, hazards, consequences: A national pattern is evident. New York, NY: Physicians for Automotive Safety.

Scafe, M., & Round, J. (1979, December). High speed pursuits. The Police Chief, 36-37.

Wilson, C., & Brewer, N. (1992). One-and two-person patrols: A review. Journal of Criminal Justice, 20,(5), 443-454