

Risk Factors and Decision-Making in Potentially Injurious Motor Vehicle Activities

A Dissertation

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Samuel Jacobs, MPH

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Advisor: Dr. Hyun Kim, ScD

Co-Advisor: Dr. Nichole Morris, PhD

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DEDICATION

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ABSTRACT

Objective:

Driving a motor vehicle can be a dangerous experience. Motor vehicle crashes were the leading cause of unintentional injury death for individuals aged 5-29 in the United States in 2020 (Centers for Disease Control and Prevention, 2005). The pursuit of a fleeing motor vehicle and the use of a motor vehicle crash as a method of suicide are two specific driving activities that have the potential to lead to injury; in the case of the latter, an intentional injury to the driver can result in the unintentional injury of a bystander. Previous research has examined several risk factors of both these activities, but further exploration remains. This research aims to approach these activities through the lens of hermeneutic phenomenology to mold the research questions and methods to greater explore how the world experiences or *lifeworlds* of individuals involved in pursuits and motor vehicle suicides may impact the decisions made leading to and during the event (Brooks, 2015; Heidegger, 1962).

Methods

Each of the three studies in this research addresses potential risk factors or influence on the phenomena of pursuits or motor vehicle crashes as a method of suicide through different methods. Semi-structured interviews with law enforcement officers (n=9), public defenders(n=9), and individuals who had fled from the police (n=20) were analyzed with a previously utilized framework to incorporate hermeneutical phenomenological analysis to identify essential themes of influences that influenced decision-making prior to and during a pursuit (Ajjawi & Higgs, 2007). A survey on perceived restrictiveness of pursuit policy was sent to the law enforcement agencies across Minnesota to be used in concert with data from the Uniform Crime Report (UCR) from the Minnesota Bureau of Criminal Apprehension (BCA) to

understand further the relationship between perceived restrictions of a policy and the number of reported pursuits by the agency. Collected policy data for State Patrol was utilized with their incident level data to understand further the association between increased policy restrictions and the outcome of pursuits. The final study of this research utilized data from the National Violent Death Reporting System (NVDRS) to analyze the prevalence of different demographics and psychosocial circumstances that may differ within suicides utilizing motor vehicle crashes as compared to another method.

Results:

Findings from the interviews with officers found how policy and personal experience drive officers' decision-making when deciding to pursue and actions during the pursuit. Likewise, interviews with public defenders and offenders showed prior experience with law enforcement and their current legal situation drive the decision to flee officers, and the desired outcome of pursuits influences the decisions during the pursuit. Within pursuit policy, only policies perceived to discourage pursuits outright resulted in an impact on reported pursuits. State Patrol's policy update remained the same proportion of pursuits ending in non-initiation or law enforcement disengagement.

Criminal/legal problems along with a history of suicidal attempts or thoughts and disclosure of suicidal intent were all circumstances that had a higher prevalence in motor vehicle crashes than in non-motor vehicle crash methods. History of mental health disorders, substance use/alcohol abuse, physical health problems, family/friend death, and job/financial problems all were more prevalent in non-motor vehicle crash suicides compared to motor vehicle crash suicides.

Conclusion:

Each study of this research showed how addressing traffic safety and injury prevention topics through the lens of phenomenology and *lifeworlds* can provide a new way to address research questions and the context of findings. While not mutually exclusive to phenomenology, this way of thinking may help guide future research questions to bring a more integrated approach to understanding risk factors and injuries.

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1 INTRODUCTION

1.1 PURPOSE AND SIGNIFICANCE

Decision-making of motor vehicle incidents is a complex process and leads to driving being a potentially dangerous activity. Whether intentional or unintentional, the use of a motor vehicle at high speeds, in high-stress scenarios, or just improper use, can result in injury or death. Motor vehicle crashes were a leading cause of unintentional injury death between ages 5-29 in 2020 (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, 2005). Motor vehicle crashes can happen for a variety of reasons of varying risk. The pursuit of a fleeing motor vehicle by law enforcement and the use of motor vehicle crash as a method of intentional self-directed violence are actions that, while rare, are activities that can lead to injury and death as the result of high-risk usage of a motor vehicle. Both pursuits and suicides utilizing motor vehicle crashes are reflections of impulsivity and aggression in driving culture, and can lead to the injury of the participants and bystanders alike. While different in the desired outcome, both pursuits and suicide via motor vehicle crash are incidents that can offer key insight into areas of overlap from other areas of human health.

1.2 THEORETICAL FRAMEWORK

During any given experience, spheres of influence from across an individual's life can impact the decisions made at the moment. This concept described within the idea of a *lifeworld*, developed originally by Edmund Husserl, and used in transcendental phenomenology and then reframed and expanded in "Being and Time" by Martin Heidegger for use in hermeneutic phenomenology (Heidegger, 1962). The *lifeworld* is the concept that an individual is a participant in the world

and has a set of experiences that shape and mold the lens through which one views the world. Another part of hermeneutic or interpretive phenomenology, situated freedom adds dimension to the *lifeworld* by continuing that as an individual is a participant in the world, they are free to make choices, but their choices are conditioned based on their circumstances. The investigation into how *lifeworlds* drive the decision-making process of phenomena typically ties to retrospective qualitative analysis via phenomenological approaches. As analysis collates and categorizes human experiences, this core concept of the first analysis of hermeneutic phenomenology helped shape the questions being asked over each objective of this paper. In the quantitative methods, this core concept influences the theoretical models (i.e., Directed Acyclic Graphs) that inform the statistical models. Policy represents a large sphere of influence on the decision-making of an officer, while the circumstances of the crisis characterize the sphere that leads up to an individual's decision to attempt suicide.

1.3 RESEARCH QUESTION AND OBJECTIVES

The research presented intends to address how an individual's *lifeworld* and other circumstances impact the decisions made during a police pursuit or in the decision to use the crashing of a motor vehicle to inflict intentional self-harm. For this study, characterization of the *lifeworld* occurs through quantitative and qualitative data. Interviews with individuals who are knowledgeable in pursuits from both sides of the law, the analysis of law enforcement's policy on conducting pursuits, and the analysis of the circumstances experienced by individuals who used a motor vehicle crash as a form of intentional self-harm will each contribute to this overarching question being pursued. While we cannot address every aspect of an individual's life that may hold sway over the decisions investigated in these analyses, the concept of the

lifeworld will drive the aims of the studies. Across each of the three individual studies, the research intends to identify and describe the spheres of influence from the *lifeworlds* of individuals involved with pursuits, determine the impact of pursuit restriction in practice, and what circumstances in an individual's life may lead to a motor vehicle crash as their chosen method of self-directed suicidal violence.

1.4 PREVIEW OF LITERATURE

Police pursuits and suicide via motor vehicle crash research of the past share the trait of having very targeted studies addressing these rare events in multiple populations. Research into the risk factors of law enforcement's pursuit of motor vehicles began in the 1960s with previous studies addressing environmental and legal risk factors. Studies into suicides utilizing motor vehicles have explored some of this decision-making as well as other personal factors, but primarily in Scandinavian countries. In each case, prior literature developed the basis of risk factors and confounders of interest within this research. Philosophical literature describing phenomenology provided guidance for holistic research questions and qualitative analysis.

1.5 CHAPTER OVERVIEW

Sections of this dissertation will progress through the literature review and the methodology utilized by the different aims of the study. While each chapter that covers one of the aims of the study will contain its own relevant background and methodology, these initial sections will provide a broader examination of the information utilized across the aims. Chapters focusing on the specific aims begin with the qualitative analysis of interviews conducted with pursuit-involved individuals and public defenders that develop a picture of the spheres of influence that

drive-decision making in pursuits. Following the qualitative study, a quantitative analysis of pursuit policy will help further develop an aspect of the decision-making influences law enforcement officers are guided by in their job. The final aim will address the decision-making in a different potentially injurious motor vehicle incident by addressing how psychosocial circumstances in an individuals life may influence them to choose a motor vehicle crash as a method of self-directed violence. The concluding chapter will be the discussion of how this research helps better understand these specific, dangerous driving behaviors and where this research can be deepened in the future.

2 LITERATURE REVIEW

2.1 DEFINITIONS

The terminology used for the purpose of this dissertation falls under three categories: philosophical, methodological, and incident. As the core of these writings and analyses are based on the philosophical underpinnings of hermeneutical phenomenology, understanding the terminology used in this philosophy is crucial. Methodological definitions bring a base of knowledge to the understanding of the analyses conducted. Incident terminology helps define the cases over the different aims of this paper.

2.1.1 Philosophical Underpinnings of Phenomenology

The core philosophical concepts behind hermeneutical/interpretive phenomenology are rooted in the work of Martin Heidegger, primarily in his work "Being and Time" (Heidegger, 1962). Heidegger's philosophy grew out of the writings of Edmund Husserl and their transcendental approach to phenomenology. Husserl's work, "The Crisis of European Sciences and Transcendental Phenomenology: An Introduction to Phenomenological Philosophy", initially established the concept of a *lifeworld*. This initial conception of Husserl characterizes the *lifeworld* as a world in which phenomena are experienced and interpreted by individuals (Brooks, 2015). Husserl believed that this concept could be used as a basis to identify what makes a phenomenon distinct from other experiences but to do this, one must remove themselves from the situation and eliminate the bias that a researcher has towards a phenomenon. Heidegger disagreed that someone could remove themselves from the situation to research a phenomenon because humans are intrinsically tied to their *lifeworld*. From this reality that Heidegger describes, phenomenological analysis becomes more interpretive and descriptive than Husserl's conception

of phenomenology. Interpretation is conducted through the hermeneutic circle, or the movement between the collected data, previous knowledge, and the analysis of the data.

2.1.2 Selected Methodologies

Methods utilized within the past literature and the aims of this dissertation follow both qualitative and quantitative methodologies. Quantitative methodologies encompass primarily the use of a range of regression models. Regression modeling utilizes linear matrices to establish coefficients of association between an exposure and an outcome while accommodating other confounding and mediating factors. Qualitative methods gather variations of narrative data using techniques such as interviews or surveys. Each quantitative and qualitative methodologies follow theoretical structures and models to guide the development of methods specific to individual research questions and studies.

2.1.3 Incident categorizations

Activities encompassed within the aims and background are two potentially injurious activities utilizing motor vehicles: the fleeing/pursuit of motor vehicles within a law enforcement and public interaction, and the use of motor vehicle crash as a method of suicidal violence. In the case of fleeing and pursuit, this can occur whenever an individual avoids stopping or pulls away from a traffic stop while already stopped. There is typically no required distance to be considered an attempt to flee, nor duration as pursuits discontinued by officers are often reported as such.

Motor vehicle crashes that are utilized as a method of self-directed violence can be defined by a number of more specific outcomes such as single vehicle crashes into standing objects or off precipices, intentionally driving a vehicle into a body of water with the intent to drown, or

intentionally crashing their vehicle into another vehicle. To be considered self-directed suicidal violence, the act must encompass “behavior that is self-directed and deliberately results in injury or the potential for injury to oneself. There is evidence, whether implicit or explicit, of suicidal intent” (Crosby et al., 2011, p. 19). Formal categorization comes through ICD-10 codes. The intentional crashing of a motor vehicle is categorized as “X82”.

2.2 DATA ON THE PROBLEM

2.2.1 Aims 1 and 2

As of currently there are no national databases collecting the total number of pursuits that occur across the United States. Currently, the National Incident-Based Reporting System (NIBRS) only collects an incident as a pursuit if there was an injury that occurred which provides a misrepresentation of total pursuits. However, in Minnesota, there is a pursuit reporting system collected by the Bureau of Criminal Apprehension (BCA) on an annual basis. From 2012 to 2020, the number of initiated pursuits rose from 759 to 2640 (Harrington et al., 2020). Within each year injuries occurred in officers, fleeing individuals, passengers, and bystanders alike. In 2020 alone, there were ten fatalities, 39 serious, and 113 minor injuries, there were also another 170 other injuries that the BCA classified as “possible injuries”. A previous study utilizing the Fatal Accident Reporting System (FARS) reported that there was, on average, one fatality per day in the United States from 1982-2004 as a result of police pursuits, with a third of those fatalities being bystanders (Hutson et al., 2007).

2.2.2 Aim 3

In 2020, there were 36,820 suicides for individuals aged 10-64, representing the fifth most common cause of death. Of these deaths, 79.5% were due to firearms (48.4%) and suffocation (31.1%) (Centers for Disease Control and Prevention, National Center for Injury Prevention and

Control, 2005). An estimate from a prior study that the World Health Organization (WHO) placed motor vehicle crashes as 0.4% of male suicides and 0.1% of female suicides (Michel et al., 2000). Within the same context, a review of studies of motor vehicle crashes found that between 1% and 7% of all traffic fatalities are suicide attempts (Routley et al., 2003).

Motor vehicle crashes also come with monetary costs, not only for the driver, but for other vehicles who are collided with as well. A Finnish study found that amongst large goods drivers (what the US would consider semi-trucks) who were struck by a suicidal driver, in cases that received compensation from insurance, the median compensation was 2,100€ (\$2775.11 in 2023) for personal injuries and 61,280€ (\$80,980.42 in 2023) in property damage (Radun et al., 2019). Within these collisions, a follow up qualitative study involving focus groups with the large goods truck drivers involved in these crashes found that there were lasting psychological effects on drivers (Radun et al., 2021).

2.3 OVERVIEW OF STUDIES TO DATE

2.3.1 Aims 1 and 2

Research into the incidence and pursuit of fleeing motor vehicles extends back into the 1960s and 70s, in particular understanding pursuit policies such as Fennessy, Hamilton, Jocelyn, and Merritt's "A study of the problem of hot pursuit" along with Fennessy and Joscelyn's "A National Study of Hot Pursuit" (Fennessy et al., 1970; Fennessy & Joscelyn, 1972). Findings from this study laid the basis for the categorizations of pursuit policies that have been used in other studies (Alpert, 1987). The broadest categories as developed by Fennessy et al. and break polices into three potential levels of restriction: "Judgmental", "Restrictive", or "Discouragement". "Judgmental" policies allow officers to make the decision to pursue but not

without review after the incident. “Restrictive” policies add restrictions on various aspects of the pursuit initiation such as no felonies, location restrictions, etc., and may include greater oversight from supervisors and review after the pursuit. “Discouragement” policies do not ban pursuits but actively discourage the use of pursuits outside of extreme circumstances. These iterated upon and expanded as time went on such as the expansion of “Restrictive” and “Judgmental” definitions to provide more finite categories (Kennedy et al., 1992).

As noted by Alpert and Lum pointed out in “Police Pursuit Driving: Policy and Research” after this initial policy and risk work of Fennessy group papers, along with Physicians for Automotive Safety and worked in the 1980s from the California Highway Patrol, early research agreed that pursuits were dangerous, although with differing in magnitude. These early studies could not come to a consensus on “the source or the cause of the danger” (Alpert & Lum, 2014).

Into the late 80s, Alpert and Dunham analyzed a number of factors for pursuits including outcomes. According to one of their studies reviewing 952 pursuits from Miami and Dade Counties, over half (54%) of pursuits were initially initiated due to traffic violations (Alpert & Dunham, 1988). Within the pursuits reviewed, 67.8% ended in an arrest, 32.6% resulted in a crash and 16.8% involved personal injury. However, a later study reported that, only 4.2% of these pursuits ended from officers voluntarily terminating the pursuit. Across future studies, findings corroborated that the large majority of pursuits are initiated over traffic offenses (Brewer & McGrath, 1991; Reaves, 2017; Senese & Lucadamo, 1996). One exception to this would be a study by Alpert in 1997 that found traffic violations decreased to 45% within Miami-Dade County from 1990-1994 but remained the most common reason. Pursuits in Omaha, Nebraska from 1992-1994 were also a part of this study and showed 51% of pursuits were for traffic initiations (Alpert, 1997; Alpert et al., 1997).

2.3.2 Aim 3

Previous literature on motor vehicle suicide is rather limited, but non-existent. Many of the prior studies addressed some risk factors and commonalities in motor vehicle crashes as suicides. A number of the early studies took place using Finnish data (Hernetkoski & Keskinen, 1998; Keskinen & Pasanen, 1990; Ohberg et al., 1997; Radun et al., 2019). Characteristics of the deliberate crashes reported in Keskinen and Pasanen 1990 specified suicides often include head-on collisions with stationary objects or other large vehicles. Demographic and other characteristics were also identified as a descriptive commonality amongst cases, such as identifying as male, aged 25 to 34 years old, with a history of depression or other mental health disorders (Gauthier et al., 2015; Hernetkoski & Keskinen, 1998; Milner & De Leo, 2012; Murray & de Leo, 2007; Routley et al., 2003).

2.4 POTENTIAL RISK FACTORS

2.4.1 Aims 1 and 2

Risk factors of pursuits are classified into two aspects, risk of incidence and risk of injury. Although the risk of incidence is the primary focus of Aims 1 and 2, many of the risk factors for injuries overlap with the risk factors of incidence per the influence injury risk factors have on the decision-making process. Risk factors previously identified to have an association with injury include aspects related to the participants in the situation like type and speed of the car, violation, and the use of termination techniques, environmental conditions such as road conditions, location, and lighting conditions (Payne & Fenske, 1997; Rivara & Mack, 2004; Wade, 2015). Even when these variables are not directly impacting the physics of the pursuit, aspects such as the type of violation may impact the decision making of the officer and the fleeing

individual. As such many of the variables above are suggested decision-making points for officers in model policies (Appendix 1: Minnesota Peace Officer Standards and Training Vehicle Pursuits Model Policy). Age and gender also impact the likelihood of negative outcomes but will not be tested quantitatively within Aim 2 (Alpert & Dunham, 1989).

2.4.2 Aim 3

To add to the demographic commonalities such as age, gender, and history of mental health disorders that were discussed in prior sections, other studies have indicated that demographic variables are associated with the choice of suicide methodology. For instance, men and older individuals are more likely to utilize a firearm, while married individuals are less likely (Cai et al., 2021; Callanan & Davis, 2012). Beyond these demographic variables, individual psychosocial stressors can be associated with the choice of motor vehicle crashes. A 2012 study from Australia utilized data similar to that of NVDRS found about a 5% difference in prevalence between motor vehicle suicides and all other methods in relationship conflicts (63.5% in motor vehicles vs. 68.4% in all other methods), legal issues (88.5 % vs. 93.5%), and financial problems (88.5 % vs. 93.3%) (Milner & De Leo, 2012). Another study from Finland, addressed potential differences in recent life event prevalence in males and females who were at-fault light motor vehicle drivers colliding with heavy vehicles and found no evidence for differences (Sassi et al., 2018).

3 RESEARCH DESIGN AND METHODS

As discussed within the literature review, while Aim 1 and Aim 2 are disparate within topic compared to Aim 3, they share a core philosophical underpinning in the methodological approaches. Each study started from the core ideal of further understanding an aspect of the *lifeworld* of an individual participating in a potentially injurious phenomenon. Each Aim approaches the human story in a different facet, through the direct storytelling of interviews about their pursuit experiences, through the perception of policy restriction in pursuing fleeing individuals, and through the circumstances individuals experience that led to driving a motor vehicle as a method of suicidal violence.

3.1 SPECIFIC AIMS

3.1.1 Aim 1. Illustrate the phenomena of a pursuit in the context of the *lifeworlds* of law enforcement officers and those who are fleeing the officers.

This aim will assess the phenomena of a police pursuit by incorporating the impact of the *lifeworlds* of officers and fleeing individuals using qualitative methods to synthesize the narrative.

Hypothesis 1.1: Individuals who flee from officers in motor vehicles will describe circumstances from personal experience with and social circles interactions with police that influence their decision to flee.

Hypothesis 1.2: Officers decision to initiate or continue a pursuit to the point of termination as they become more experienced in their profession will decrease.

3.1.2 Aim 2. Determine how officer perception of Minnesota police departments' policies affects the number of pursuits the department reports and their outcomes.

This aim will address the relationship between pursuits and perceived policy restrictiveness at a department across the state of Minnesota, through the impact that perceived policy restriction has on the rate of pursuits that are reported by departments across the state, comparative to the population size in the county they serve. Minnesota State Patrol's pursuit reports will address how policy change can influence the outcomes of pursuits.

Hypothesis 2.1: When departmental policies are perceived as less restrictive, there will be an increase in pursuit rates as compared to when policies are perceived as more restrictive.

Hypothesis 2.2: The proportion of pursuits that end from officer non-initiation or discontinuation will increase after Minnesota State Patrol's introduction of a decision-making model.

3.1.3 Aim 3. Determine the subgroup characteristics within persons with apparent suicidal intent who use motor vehicle crashes over other common methods of suicidal self-directed violence.

This aim will assess various stressors and demographics that may be more prevalent with the use of a crash as the cause, compared to other methods of suicide.

Hypothesis 3.1: Certain circumstances used to classify psychosocial stressors will be more prevalent in suicides involving intentional crashes than in other methodologies.

3.2 TARGET POPULATION

3.2.1 Aim 1

To fully understand the *lifeworlds* of the individuals who experience pursuits, the target population for this Aim must fully reflect all involved parties. Individuals who are fleeing from

law enforcement and law enforcement themselves both bring unique perspectives to the experience of a pursuit. Public defenders were also included in the population of this study. While not directly involved in the actions of a pursuit, public defenders have a broad view of the current trends in fleeing in terms of reasons that their clients flee and how law enforcement interacts with fleeing individuals. Each three of these populations add to the overall experiential knowledge sought after in this Aim.

3.2.2 Aim 2

In continuation with the goals of Aim 1, Aim 2's target population is the law enforcement of Minnesota. As this Aim's goal is to further add to the understanding of officer decision making, access to this population will come through high level contacts at the law enforcement agencies of Minnesota.

3.2.3 Aim 3

For the final Aim, the methods are designed to further understand individuals who choose to drive their motor vehicle as a form of suicidal violence. Due to the complexities of suicidal ideation culturally, the target population for this aim will be those who choose to use suicidal violence within the United States. A special focus within this population will be placed on suicides utilizing motor vehicle crashes.

3.3 CASE DEFINITION

3.3.1 Aim 1

Eligibility across each of the sub-populations of this study was unique to the population. For law enforcement officers to have been eligible they must have been current members of Minnesota law enforcement and had been involved with a pursuit in their career. Public defenders must

have been currently a public defender in Minnesota who had had clientele who have fled from officers in a motor vehicle. The eligibility for individuals who had fled previously in a motor vehicle required the individual to have fled from law enforcement in the past, is above 18 and is not currently in the legal process for an incident that involved fleeing in a motor vehicle. This final caveat is added to assist with reducing the risk of participants feeling coerced to participate with the potential for special treatment in current legal proceedings.

3.3.2 Aim 2

The pursuit count and definition for Aim 2 come from the required reporting at the state level in Minnesota. Agencies are required to fill out a pursuit report within 30 days of a pursuit and submit it to the commissioner of public safety pursuant of Minnesota Statutes 626.5532 (Appendix 1: Minnesota Peace Officer Standards and Training Vehicle Pursuits Model Policy). The counts of total, initiated, and assisted pursuits are reported in an annual Uniform Crime report which includes downloadable data for public use. For local agencies and sheriff departments, this summary is the only source of case data, which spans from 2015-2020. However, Minnesota State patrol provided incident level data through their reporting system. State Patrol's reporting system collects more data than the base pursuit report required by the state. Each participating officer fills out a report for everyone who was fleeing, so there may be multiple reports for a single fleeing incident. Within this Aim, data was collapsed down to the primary report for the driver of the vehicle and a variable was created to count how many officers and fleeing individuals were involved in the pursuit. This method preserved relevant information such as reason for pursuit, termination techniques, and other similar information along with assessing the magnitude of involved people in the pursuit.

3.3.3 Aim 3

Deaths as the result of suicide were identified through the National Violent Death Reporting System (NVDRS) run by the United States Center for Disease Control (CDC). NVDRS is a surveillance system that collects and reviews narratives from the coroner, medical examiner, and law enforcement investigations to determine cause, method, and circumstances around deaths that were the result of violence. ICD-10 coding based on the death certificates are reported within the NVDRS system and help to identify cases of suicidal motor vehicle crashes. Aim 3 did this through a four-phase system. An initial narrative analysis checked the provided narratives of each incident that was initially coded with an ICD-10 code of “X82 – intentional self-harm by crashing of motor vehicle” to check for misclassification. Some examples of cases that were recoded as non-motor vehicle crashes included pedestrian and train collisions, carbon monoxide poisoning, and actions of passengers that resulted in the passenger’s death. After the initial narrative analysis, the second step was the creation of narrative search terms to identify cases within ICD-10 codes “X83” and “X84” which identify incidents that were either other or unspecified means respectively. The search terms (found in Appendix 5: Narrative Search Terms) were run against a test sample of 200 confirmed cases and non-cases for validity (188/200 matched, Cohen’s kappa 0.75). The third phase was the running of the narrative search matching using text and phrase matching in R. The fourth and final phase of the case identification was an additional narrative review of other and unspecified cases that were identified as potential matches through the narrative search.

3.4 COMPARISON DEFINITION

3.4.1 Aim 1

Interviews with each subgroup were semi-structured and followed questionnaires that were tailored to the individual subgroups. The full questionnaires for each subgroup are available in Appendix 4: Interview Questionnaires. Each group followed a similar structure within the questionnaire, beginning with general information about the participant that is relevant to the pursuit process before moving to increasingly specific information about the reasonings and thoughts that an individual has during their experience. In the case of public defenders, questions were more aimed at collecting a general trend or summary based on their clientele, as they could not precisely know their client's thoughts at the moment.

3.4.2 Aim 2

The primary exposure within Aim 2 for the local agencies and sheriff departments is the perceived restrictiveness of the policy on pursuits at a law enforcement department. Perceptions on current and past policy were categorized into one of three levels by a primary contact at local agencies and sheriff departments within Minnesota. The three levels of restrictiveness were defined by prior literature on pursuit policy that provides a high-level categorization. "Judgmental" is the lowest level of restrictiveness where officered are placed under limited restrictions and can make the major decisions themselves during the initiation, tactics, and termination of a pursuit. The middle level of restrictiveness is "Restrictive" which places more restrictions on the decision making of pursuing officers and brings in more supervisory input during and after the pursuit. Most restrictive of the three categories is "Discouragement" which actively cautions against pursuits barring extreme circumstances. Policy

restrictiveness was reported for both before and after the most recent policy update, along with the year that the policy update took place.

For the Minnesota State Patrol side of Aim 2, due to the nature of how troopers operate, the scale of individual State Patrol districts, and access to incident level data, the primary exposure was a policy update that went into place May of 2019 that introduced a more formalized decision-making guide. The decision-making guide placed various scenarios and situations on different ends of a continuum of risk, along with an exclusionary list of times that troopers can pursue fleeing individuals. State Patrol also indicated that training protocols were changed as a part of the policy update as well.

UCR and Census data provided the other comparison variables. County population size, median income, and crime rate were included as potential influences on the number of pursuits and policy restrictiveness within an area served by a law enforcement agency.

3.4.3 Aim 3

Demographic and circumstance variables are gathered and identified as part of the NVDRS abstraction process. Demographic variables include gender, age, education, marital status, and racial identity. Circumstance variables include potential psychosocial stressors that are often associated with acts of violence in general and suicide in particular. From the initial circumstance variables provided by NVDRS, 12 groupings of single or multiple circumstances were created including: mental health (non-specific to suicidality), substance/addiction, history of suicidal attempts, history of suicidal thought, disclosure of suicidal attempt, intimate partner problems, criminal/legal problems, physical health issues, job/financial issues, death of family or friend, school problems, and other circumstances. A further breakdown of the original NVDRS

circumstances that make up these new groupings is available in Appendix 6: NVDRS

Circumstance Grouping.

3.5 CONTACT PROCEDURES

3.5.1 Aim 1

Each interview subgroup utilized different contact procedures. Law enforcement officers were recruited through convenience sampling through communication with Towards Zero Deaths' (<https://www.minnesotatzd.org>) along with Chief and Sheriff Organizations. Officers who were interested in participation emailed the research team to schedule an interview time. Once an interview time was set, the officer was sent a copy of the consent form to review prior to the interview. Nine officers were consented and interviewed before reaching saturation. Similar methodology was used to recruit and interview public defenders. Convenience sampling occurred through communication through the Office of Public Defenders of Minnesota. Like with officers, interested public defenders contacted the research team to schedule an interview and receive a copy of the consent form. With no intention of matching sample sizes with officers, nine public defenders were also consented and interviewed before saturation was met. Individuals who fled were recruited through convenience sampling while working with programming coordinators at Anoka County Jail in Minnesota. Flyers with recruitment information were posted within the jail and individuals were allowed to sign up for an interview across three interview days. On each interview day, interested individuals were brought to meet the interviewer by jail staff. A screening survey was issued to participants to assure eligibility. Eligible individuals were then given a consent form and underwent the consent and interview process. Participants were given a copy of the consent form to keep. In total, 20 individuals were found eligible, consented, and interviewed as a part of the fleeing individual subgroup.

3.5.2 Aim 2

Local agencies and sheriff departments were contacted through contacts with TZD and public contacts. Data was collected in two waves. The first wave began December 17th, 2020, and receiving its final response in October of 2021. The second wave on March 3rd, 2022, and was closed on March 31st, 2022. Between both waves, 133 agencies responded to the survey.

Policy information for Minnesota State Patrol was collected through an informational interview to further understand how the policy had changed from 2015 through 2020. Over this period, three policy changes occurred in 2016, 2017, and 2019 with the largest change occurring in 2019, introducing the decision-making guide.

3.5.3 Aim 3

Data was obtained from NVDRS through the Restricted Access Database (RAD). A formal request was submitted to the NVDRS along with analysis plans and data security measures. Data within NVDRS is produced through death certificates, coroner/medical examiner reports, law enforcement reports and input from the data abstractor. Additional sources of information come from expanded data sources like Child Fatality Review (CFR) team data, Intimate Partner Violence (IPV) expanded data, Crime Lab Data, and Hospital Data.

3.6 CONCEPTUAL/CAUSAL MODELS

3.6.1 Aim 1

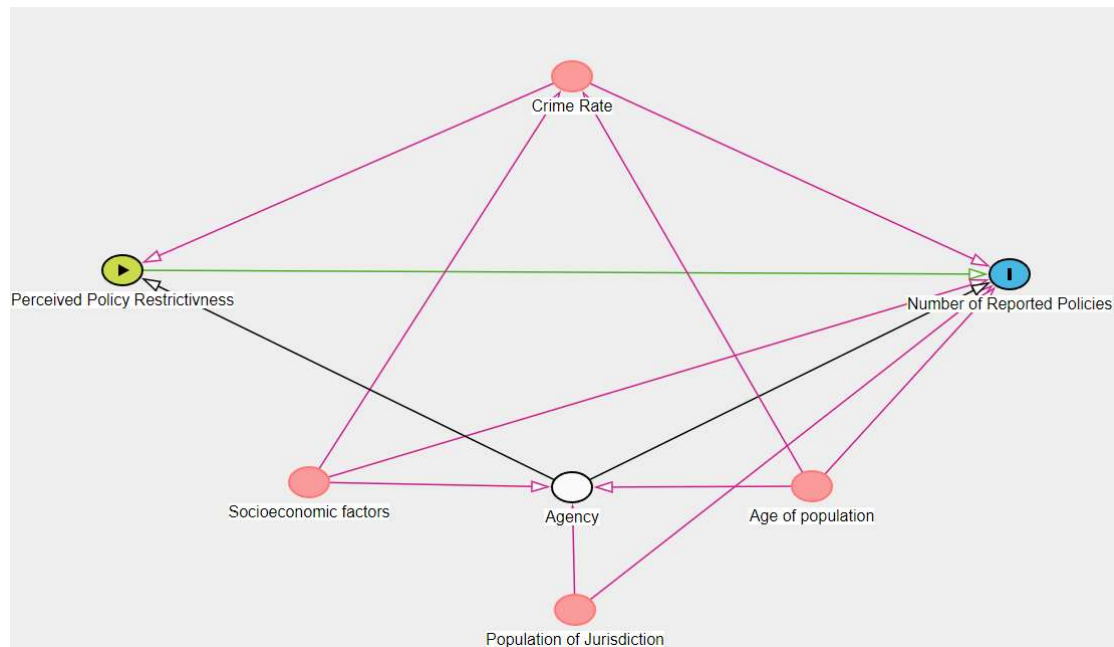
While each Aim of this dissertation is built upon understanding the *lifeworld* and influences from a phenomenological lens, Aim 1 is truly based in hermeneutical phenomenology and its application within qualitative analysis. At the core of hermeneutical phenomenology, qualitative data is used to distill the essential aspects of individuals' backgrounds and lives that impact an

individual's experience of the phenomena. How hermeneutical phenomenology extends beyond transcendental phenomenology is how it manages bias. Where transcendental phenomenology assumes that researchers can bracket out bias during the analysis process, hermeneutical phenomenology posits that researchers are inherently biased and as participants in the world, cannot remove bias from interpretation. Instead, hermeneutics asks the researcher to acknowledge their biases and uses interactive analysis moving between data, literature, and interpretation to reduce bias.

3.6.2 Aim 2

Aim 2 used a conceptual model in the form of a Directed Acyclic Graph (DAG) to help understand how the perceived policy impacts the total number of pursuits reported by a department Figure 3-1. Other factors that may impact this relationship were also mapped onto the DAG as well. Variables such as population size, age of population, and socioeconomic factors would all impact the number of pursuits reported. In addition to these population characteristics, the number of pursuits can be a result of the overall criminal infractions occurring within an agency's jurisdiction. Each of these confounders holds in both the local agency/sheriff's departments and the State Patrol portions of the study. Where the former is distinct across agencies, the latter is distinct across districts.

Figure 3-1 DAG of perceived policy's association with total number of reported pursuits



3.6.3 Aim 3

Within the data of Aim 2, the case only nature does not permit true causal diagramming.

However, conceptual mapping was used similarly to a DAG to show what other factors may influence the choice of a motor vehicle crash as a method of suicide. The primary variable being evaluated for association is the psychosocial stressors that make up the circumstances in an individual's life leading up to suicide. Demographic variables such as gender and marital status have also been shown to differ across methods of suicide and so was included in conceptual modeling as having an impact on methodology of suicide and the circumstances and individual experiences (Cai et al., 2021; Callanan & Davis, 2012).

3.7 DATA ANALYSIS

3.7.1 Aim 1

Data from pursuit participants and public defenders were analyzed utilizing the hermeneutic circle and a methodological outline initially used by Rola Aijawi and Joy Higgs in 2007 (Table 3-1). Each stage of the data analysis builds upon the previous level. As transcripts are created, checked, and analyzed, iterations of interpretation develop and refine to understand the essential themes that describe the influences from individuals' *lifeworlds* that impact decision making in pursuits.

Table 3-1 Stages of Data Analysis (Ajjawi & Higgs, 2007)

Stage	Stage Description
1. Immersion	<ul style="list-style-type: none">• Transcription of audio recordings by the researcher• Multiple readings of the transcripts• Initial identification of responses of interest
2. Understanding	<ul style="list-style-type: none">• First round of coding using NVivo based on participant constructs
3. Abstraction	<ul style="list-style-type: none">• Grouping of constructs and codes into sub-themes
4. Synthesis and theme development	<ul style="list-style-type: none">• Grouping of sub-groups into themes
5. Illumination and Illustration of the development	<ul style="list-style-type: none">• Returning to literature to contextualize themes• Identifying how themes create the story of the phenomenon
6. Integration and critique	<ul style="list-style-type: none">• Discussion of themes and stories amongst the research team• Reporting final results

3.7.2 Aim 2

Aim 2 utilized mixed-effect models. Perceived policy restrictiveness within the local agencies and sheriff departments was the primary exposure for a Poisson regression with the outcome

being the total number of pursuits reported by the agency in a year. The perceived policy restriction for each year was designated by responses to the survey. Total pursuit count was offset by the population of the county and agency services, and the model was adjusted for a policy change within the year, year, and the overall crime rate reported by the agency. Multiple imputation was utilized to account for missing crime data. To account for the repeated measure of pursuits each year in an agency, a random intercept was used for each agency.

For the State Patrol mixed effect model, the outcome were pursuits that ended in a discontinuation or non-initiation from law enforcement within a quarter for a State Patrol district. A proportion was created by offsetting the total number of pursuits that a district reported in a quarter. For modeling, this used Poisson regression for an interrupted time series, with the primary exposure as being before or after the decision model being introduced in May 2019. Due to sample size and convergence, no other factors were adjusted for within the model. Predictions of the proportion of pursuits that ended in a non-initiation and discontinuation were estimated from regression coefficients to better visualize how the policy update impacted the outcome of interest.

3.7.3 Aim 3

As Aim 3 is descriptive in focus, analysis will compare the prevalence of demographic characteristics and circumstances in univariate analysis. Additionally, models adjusted for demographic characteristics will be run for each circumstance. To measure the prevalence of circumstances within motor suicides, regression models will be Poisson models with robust variance to compare chosen methods of suicide. These methods are similar to Milner & de Leo (2012) but expand upon that study with a greater sample size and the addition of regression analyses.

3.8 SUB-STUDIES FOR BIAS EVALUATION

3.8.1 Aim 1

Accounting for bias within a qualitative analysis is crucial to confront within the design and throughout the analyses. As a part of phenomenological analysis, bias is confronted through stating the background and biases that the researchers might bring to the interpretation, but also through the hermeneutic circle. Sub-studies were not conducted as a part of the bias evaluation for Aim 1, however, findings were discussed with an expert within the use of force field who had done similar studies to assess the reasonableness of the themes.

3.8.2 Aim 2

Bias within Aim 2 was addressed through sensitivity analysis of cut-off points for the classifications of perceived policy restriction within the year that policy was changed and the inclusion of agency-years in which the policy changed. Adjusting the month cutoff or not including agency-years that included a policy change did not have an impact on the point estimates of the regression models within the local agencies and sheriff's departments. Within the State Patrol model, in-depth interviews and discussions with State Patrol were utilized to best understand policy and their pursuit reporting process to minimize misrepresentation of data.

3.8.3 Aim 3

Within Aim 3, the main source of bias was through misclassification of incidents. A narrative review and the testing of narrative matching on a random sample of suicides helped assess and correct misclassification bias.

RESULTS

4 RATIONALE AND DECISION-MAKING IN MINNESOTA POLICE PURSUITS OF MOTOR VEHICLES

4.1 ABSTRACT:

Objective: The decision to initiate the pursuit of a motor vehicle requires decision making on the part of both the officer and offender. This study aims to further understand the background influences that have occurred in pursuit involved individuals on both roles of a pursuit through phenomenological analysis.

Methods: For this qualitative study, the framework of a phenomenological analysis was used to guide the methodology. Semi-structured interviews were conducted with nine law enforcement officers, nine public defenders, and 20 individuals who had fled in a motor vehicle. Interviews were transcribed by the researcher, then coded with NVivo and interpreted. The concept of a *lifeworld* and the hermeneutic circle were utilized to guide the interpretation process.

Results: Officers reported policy, experience, the interaction of these spheres, and their perception of these spheres changing over as the driving forces in their decision-making.

Similarly, interviews with offenders and public defenders described how legal, non-legal, social narratives, and the desired outcome of the pursuits as their key decision points. Public defenders also expressed their frustration with current pursuit practices.

Conclusion: Findings from these interviews reveal that individuals contextualize these high stress decisions through past experiences and structural influences. Interviews also provided showed gaps in communication that could act as areas of intervention and interaction such as de-escalation training to help individuals with prior interactions with officers feel less defensive.

4.2 BACKGROUND

In Minnesota, reported motor vehicle pursuits rose yearly from 2012 through 2020. As of 2020, law enforcement reported 3109 total pursuits, a 3.5 times increase over the 847 total pursuit reports in 2012 (Harrington et al., 2020). Of these pursuits in 2020, there were 170 possible injuries, 113 minor injuries, and 39 serious injuries. In addition to these injuries, there were 10 fatalities including one officer. This leads to a rate of about 1 in every 10 pursuits reported by law enforcement in Minnesota, resulting in at least a possible injury. The risk of injury to officers, the fleeing individuals, and the public is compounded by the property damage that can occur because of the pursuit of fleeing individuals in motor vehicles. To understand the increase of pursuits and potential ways to improve the situation, one must engage with the individuals involved in a police pursuit as either party and coalesce the individuals' experiences that led to this event.

4.2.1 Prior studies for pursuit-involved individuals

Past studies have utilized qualitative methods with both individuals who have fled in the past and law enforcement officers. One prior study of individuals who were incarcerated found 46 of 144 individuals (31.9%) reported fleeing due to being in a stolen vehicle (Alpert et al., 1996; Dunham et al., 1998). Other reasons that were also reported by the 144 individuals in these interviews were being afraid of being beaten (about 1 in 5 participants), avoiding arrest (27%), or driving on a suspended license (27%). This differed from some previous quantitative studies that found traffic violations were the leading cause of initiations (Alpert & Dunham, 1988; Brewer & McGrath, 1991; Reaves, 2017; Senese & Lucadamo, 1996). Another study that did focus on groups with auto thieves in the Midwest United States found that there was not so much a decision to "flee/don't flee" in their case, but instead was "escape or get caught" (Cherbonneau & Jacobs, 2019). Within officers, studies found that the severity of the suspected

crime and environmental factors such as location, traffic, and road conditions were associated with officers making the decision to pursue a fleeing vehicle (Alpert, 1998). Another study using more risk-taking and sensation-seeking scales found that both measures correlated with an officer's likelihood of initiating a pursuit (Homant et al., 1994). Each of these past studies helps build a basis of potential aspects of the lived experience that this study aims to address further. To do this, we must address the philosophical framework that is the basis for the qualitative analysis used.

4.2.2 Phenomenology and its application to pursuits

To best understand the experiences that drive the decision-making process that results in individuals fleeing from the police and officers chasing those individuals, this study turns to hermeneutical phenomenology to conceptualize and organize the influences on pursuit-involved individuals. Hermeneutic phenomenology comes out of the philosophical writings of Martin Heidegger, primarily the work "Being and Time" (Heidegger, 1962). This form of phenomenology grew from the transcendental phenomenology of Edmund Husserl, who initially developed the concept of a *lifeworld* in their work "The Crisis of European Sciences and Transcendental Phenomenology: An Introduction to Phenomenological Philosophy". Husserl's initial description of the *lifeworld* is a concept that the world is a place in which individuals interpret the phenomena occurring in front of us by addressing what is happening, rather than why it is happening (Brooks, 2015). The difference between this hermeneutical or interpretive phenomenology and transcendental or descriptive phenomenology is that of how individuals may address bias as the observer attempting to understand a phenomenon. Husserl believed that through bracketing out bias, we could "transcend" the inherent bias, while Heidegger believed that an observer is inseparable from this bias. As such the data must be addressed

through a cycle of interpretation of the results and returning to the material, known as the hermeneutic circle, must be adopted.

As for this study into police pursuits, these interactions between law enforcement and individuals who are fleeing for a variety of reasons, that especially in the last several years, is a highly publicized and contentious topic when it comes to why negative outcomes are occurring and how they can be solved. The philosophy of hermeneutic phenomenology is the more realistic approach to managing the bias of the research team who is interpreting and analyzing the responses of the interviews conducted in this study. The iterative nature of hermeneutical phenomenology should help provide useful interpretations of the data presented by the interviews.

4.2.3 The goals of this study

This study aims to understand how the life experiences of law enforcement officers and individuals who have fled from the police influence their decision to pursue or flee, respectively. Interviews with public defenders will help provide a greater overview of some of the experiences of individuals who have fled (including juveniles who were not able to be included as their own interview sub-group), along with some understanding of a third-party view on fleeing from people involved in the follow-up. Altogether, the findings from each interview sub-group should add a greater understanding of the decision-making that goes into the potentially dangerous phenomenon of a motor vehicle pursuit.

4.3 METHODS:

4.3.1 Overview

This study utilized semi-structured interviews with individuals who are involved in the processes involved in the police pursuit of fleeing motor vehicles to generate data that can be analyzed

using hermeneutical phenomenological methods to identify themes that describe the different influences that drive the rationalization of engaging in police pursuits and decision-making process during the pursuit. The COREQ checklist was followed to ensure that methods of the paper were in line with best practices (Appendix 2: COREQ Checklist).

This study protocol was approved by the University of Minnesota Institutional Review Board (STUDY00012644, STUDY00013208, STUDY000114420).

4.3.2 Participants

Participants in this study were recruited from three sub-groups of individuals who are involved in police pursuits either as participants or who work with participants. Law enforcement officers and individuals who have fled in a motor vehicle were recruited due to their direct participation in police pursuits of motor vehicles, and public defenders were recruited for their experience working with individuals who have fled and their view on how law enforcement handles fleeing vehicles. Each sub-group was recruited until a point of saturation was met. Consent forms and recruitment material for each of the sub-groups indicated specific inclusion criteria and general topics of the questions that would be asked in the study. No other specific characteristics of the research team were reported.

4.3.2.1 *Law Enforcement Officers*

Recruitment of officers was done through convenience sampling with the assistance of Towards Zero Deaths' (<https://www.minnesotatzd.org/>) communication networks along with the dissemination of recruitment materials through Chief and Sheriff Organizations to further reach more officers and departments. Both networks had existing relationships with the research team. Officers were instructed to contact the research team directly to schedule an interview

time and receive a copy of consent materials. Interviews occurred in August and September of 2021.

Nine officers were interviewed by the end of the study. Age and experience as a law enforcement officer ranged from 25 to 57 years old and 2.5 to 33 years of experience. Work experience as a law enforcement officer included working as a correction, community service, and reserve officer. Participating officers reported involvement in 1 to 20 pursuits within the year prior to the interviews. Pursuit involvement included being the initiating officer or as support for an already initiated pursuit.

4.3.2.2 Public Defenders

Public defenders were also recruited through convenience sampling by disseminating recruitment materials through the Office of Public Defenders of Minnesota. No prior relationship with this office existed prior to the study. Like with law enforcement officers, interested participants were instructed to contact the research team to schedule an interview and receive a copy of the consent information.

As with law enforcement officers, nine public defenders were interviewed over the course of the study. This was not matched with law enforcement interview count, both arrived at saturation at this number. Public defenders ranged from 29 to 68 years old and had between 2 to 14 years of experience as public defenders. Participants' work primarily centered on felonies, and a subset of the participants' work included primarily juvenile offenders. Outside of their experience as public defenders, participants also had experience in private practices and non-legal fields, such as real estate litigation, legal rights, family law, law clerking, civil law, and teaching.

4.3.2.3 Individuals who Fled in a Motor Vehicle

Participants who had fled from law enforcement in a motor vehicle were recruited from Anoka County Jail over the course of three days: January 14, 2022; January 28, 2022; and February 4, 2022. Recruitment materials were hung within the jail by programming coordinators, and interested inmates were able to sign up to participate. Individuals were eligible to participate if they had fled in a motor vehicle but were not currently being held on an incident that involved fleeing in a motor vehicle. These criteria help to act as one measure against participants from self-incrimination and to reduce any coercion by participants believing that more lenient sentencing may result from participation in the study. To help assure that individuals fit the eligibility criterion, a screening survey including questions that would help identify individuals who had fled was given to volunteers (Appendix 3: Screening Survey). Questions were designed with the assistance of law enforcement to use their knowledge of processes that would occur if a fleeing individual got caught. This survey also helped collect minimal demographic information to help prevent the identification of individuals. Individuals who identify as male and female are both incarcerated at the study site and were eligible for participation. However, we only received male volunteers.

Over the three interview days, twenty individuals were identified as eligible and participated in the study. The ages of participants ranged from 18 to 56 years old. Participants' primary racial identification was white with 14 of 20 individuals reporting it as part of their identity. Other racial identities included 7 individuals identified as Black or African American, 4 identified as American Indian or Alaska Native, and 5 identified as multiple races (Table 4-1).

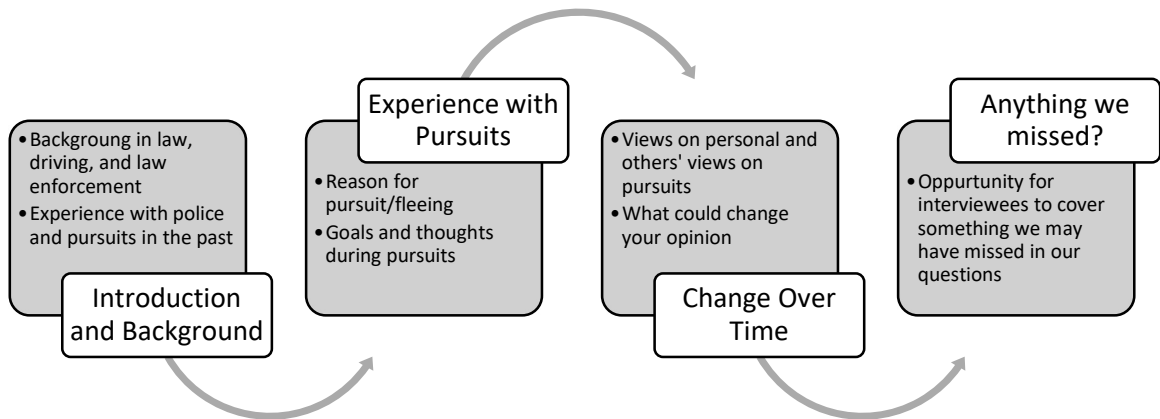
Table 4-1 *Demographics of Participants (N=20)*

Demographic	Participant Statistics
Age	18-56
Race	
Black or African American	7
White	14
Some other race, ethnicity, or origin	6
Multiracial	5

4.3.3 Interview Methods

Interviews with law enforcement officers and public defenders were conducted over Zoom, which also provided the initial transcriptions for the interviews. Individuals who had fled police were interviewed in person at Anoka County Jail, as described in the previous section. To prevent the spread of COVID-19 and assure the safety of participants and researchers, masks were worn, and interviews were conducted at an appropriate distance. Interviews in each arm were conducted by Sam Jacobs, MPH, a male graduate research assistant. Prior experience includes interviews with fire fighters in a prior behavioral and mental health study.

Figure 4-1 *Flowchart of overall questionnaire design*



A unique questionnaire was developed for each of the three sub-groups to appropriately gather relevant background information and guide the participants through their experiences with a pursuit (Appendix 4: Interview Questionnaires). Each questionnaire started with a general question about their background in law enforcement, law, and driving, followed by questions gathering more specific background with individuals experience with pursuits and police interaction (Figure 4-1). After background information was ascertained, each group was walked through the process of a pursuit to understand decision making points. Public defender questions were less timing specific and more general to their clients. The questionnaires finish by asking how their opinion and observations have changed over time, what could change the way they interact with pursuits, and if there was anything else the interviewee would like to add that was not already covered. Officer and public defender questionnaires were reviewed by study contacts in these occupations to assure appropriateness, while Dr. Geoffery Alpert reviewed the questionnaire used with individuals who have fled. Dr. Alpert is a use of force expert who has conducted similar studies with incarcerated individuals in the past. More specifically, questions for law enforcement officers included history in law enforcement, experience with pursuits, opinion on departmental policy, decisions made during the pursuit of a fleeing motor vehicle, and how their views and experiences have changed over time. Public defenders were asked about their history as an attorney and their experience prior to being an attorney (if any), experience while working with clients who have been involved in police pursuits, personal feelings on law enforcement policy on pursuits, and how these experiences and feelings have changed with time. After individuals who fled in a motor vehicle cleared the screening questionnaire, participants were asked about driving history, prior interactions with police, including fleeing, the experiences of fleeing of their social circle, their thoughts during

their most recent time fleeing, and how this most recent time may have changed from prior attempts to flee. At the end of each of the three questionnaires, participants were asked if there was any other aspect of police pursuits that they would like to share or discuss that has not been covered by prior questions.

4.3.4 Analysis:

Hermeneutical or interpretive phenomenology will drive the analytical process and coding. As a reflection of the hermeneutical circle, a process mirroring the one used by Rola Aijawi and Joy Higgs (Ajjawi & Higgs, 2007). This methodology utilizes a six-stage process to immerse oneself in the data and develop themes that characterize the *lifeworld's* impact on the decision-making process (Table 4-2). The multiple iterations of this staged process incorporated the hermeneutic circle. As a part of the first stage (Immersion), transcription was done in a two-step process. The initial transcription was done through Zoom, either from the interview recording itself or from the audio recording from interviews with individuals who have fled being played through Zoom. Utilizing this technology allowed for the timestamping of individual speakers. This even extended to the interviews with individuals who had fled. Transcripts were then corrected, added to, and reviewed over three iterations by the lead author to assure completeness and correctness. NVivo was utilized in the following steps to identify constructs and codes within the transcripts and field notes taken by the interviewer. As acknowledging bias is a core aspect of hermeneutical phenomenological analysis, it is important to identify some context around who is performing this analysis. Each of these stages was performed by the lead author, a cis-male, white researcher with experience using a similar semi-structured interviewer with first responders. Over the course of the stages, codes and themes were discussed with the greater

research team, which includes traffic safety and human factors experts along with a use of force expert.

Table 4-2. *Stages of Data Analysis (Ajjawi & Higgs, 2007)*

Stage	Stage Description
1. Immersion	<ul style="list-style-type: none"> • Transcription of audio recordings by the researcher • Multiple readings of the transcripts • Initial identification of responses of interest
2. Understanding	<ul style="list-style-type: none"> • First round of coding using NVivo based on participant constructs
3. Abstraction	<ul style="list-style-type: none"> • Grouping of constructs and codes into sub-themes
4. Synthesis and theme development	<ul style="list-style-type: none"> • Grouping of sub-groups into themes
5. Illumination and Illustration of the development	<ul style="list-style-type: none"> • Returning to literature to contextualize themes • Identifying how themes create the story of the phenomenon
6. Integration and critique	<ul style="list-style-type: none"> • Discussion of themes and stories amongst the research team • Reporting final results

4.4 RESULTS:

4.4.1 Law enforcement officers

4.4.1.1 *Overview of Thematic Findings*

Two spheres of influence (personal beliefs and departmental policy/beliefs) provide the basis for the themes that were identified within the interviews with officers. How these spheres shape the decision-making process, interact with each other and how these views have changed over time. Each of these spheres and interactions are shaped by past experiences of officers and the world they experienced.

Theme 1: Officers' Decision to pursue is driven by personal beliefs generated by job experience

The nine officers who participated in our interviews reported that the most common reasons that they initiate a pursuit are for traffic violations (n=5). However, stolen vehicles (n=4), suspicious activity (n=3), or other reported felonies (n=2) were also reported as a further rationale for pursuit initiation due to just traffic violations. These past experiences of pursuit extended beyond just the violations that individuals who fled may have committed but also included the neighborhoods and areas that they patrol. Both quoted officers below discuss how their experience with pursuits leads to a belief that even if the initial stop is for a traffic violation if the individual begins to flee, there is an underlying reason.

“I would say, most of them, the initial infraction which usually draws the officer’s attention, I think, is usually a traffic-related offense whether it's speeding, careless driving, turn signals equipment violations whatever...but I think majority of them are, just are just traffic violations that that causes the initial, obviously there's a lot more with them going on with them, usually then, then just that but that's the initial”

-Officer, 21 years of law enforcement experience

“The biggest thing is with pursuits it's easy to say, well, all these pursuits are over small crimes, but once I was working on the undercover part of it that there's a lot of serious crimes that are taking place that are just missed in there just documented as driving after suspension pursuit or a stolen vehicle or you know or a minor warrant or something...there's really underlying things going on.”

-Officer, 16 years of law enforcement experience

Frustration with the legal system not supporting consequences after the apprehension of individuals who fled in a motor vehicle also influenced the decision making of officers, but instead of influencing officers to pursue, it drives officers to pursue less. Officers reported that

without the feeling of proper punishment, individuals are more likely to flee without fearing consequences. This opinion was drawn from their experience and conversations with apprehended individuals. The quoted officer below discusses this frustration.

“I think a lot of police officers, that I talked to are discouraged from pursuing, not because necessarily the dangers of it, because we all do, a pretty good job at mitigating those I believe but yeah once we do go through all the effort to arrest somebody I pursued, the legal system doesn't have our back many criminals are getting off with slaps on the wrist they're out the next day and back to committing these crimes or not getting charged out at all, because our attorneys are too swamped they don't have the resources they need...I think that goes for all, honestly all crime but pursuits are part of that, where [it] doesn't actually result in anything, so why go through it.”

-Officer, 6 years of law enforcement experience

Safety is the final aspect of this personal sphere of influence that was discussed by officers. While policy also can impact safety-based decision-making, personal belief does drive the decisions in its own way. An officer with ten years of law enforcement experience described their personal decisions about safety as their “main goal is really to get that person to stop driving the way that they're driving. A lot of times if we turn our lights off, we slow down, they do the same. [You] know slow down, they'll start going the speed limit.” Officers’ desire for community safety is a core to their decision-making during the pursuit.

Theme 2: Officers’ decision to pursue is restricted and rationalized through the policy of a department and the culture that policy reflects

Policy from individual departments constrains and shapes the situations that officers can pursue individuals. Where the personal sphere of influence is based on experience and beliefs, the department provides more concrete guidelines for decision-making. Officers described the restrictions as potentially beneficial as they can draw lines in the sand that benefit public safety.

However, this came at a cost. Officers also described how these policies can make it difficult to do their job either by adding cognitive burden in the heat of the moment or by the officers feeling they are not able to adequately do their job. The following quotes from officers display the feelings of beneficial and excessive constraints. The first officer discusses both the pros and cons, while the second shows solely the frustration.

“I think it's reasonable because it allows officer in the moment, I'm seeing everything is going on and to be able to make a decision. Is stopping this person worth whatever risk they're posing? There's so many different events in a pursuit so many so much information to kind of take in, to determine if it's a worthy pursuit or not and it's hard when you have set standards of what you can and cannot pursue for it, it makes it tough, to make a good decision at the time of the incident”

“I like a lot of the decision models that are built into our policy, because I think it does help protect the public well still allowing us to do our job when it's feasible and when it's worth it.”

-Officer, 6 years law enforcement experience

“I think that by being so restrictive and not allowing us to make good police decisions and do good police things”

“We don't really have a lot of other tools at our disposal to use. We don't have you know technology, we don't have a helicopter, we don't have a drone, we don't have any tracking devices, fancy stuff to shoot at cars, so you know we just got to give up”

“You know its three o'clock in the morning we're on the highway and we're the only two cars out there, there you know it doesn't seem like we're not putting an undue risk to the public at that point”

-Officer, 10 years law enforcement experience

Theme 3: Officers' decision to pursue is contextualized by the intersection of policy and personal beliefs

How the previous two themes intersect with each other fully contextualizes the decision-making process that an officer goes through while pursuing a fleeing motor vehicle. Two areas that these spheres primarily interacted with were the feeling of safety and policy not reflecting the reality of why people flee. The first officer quoted below talks expresses how while there is an understanding that the policy is there to protect the safety of the public, but as is in this officer's department, it leans too far into the safety restrictions to the point that the balance is not met with the benefit of apprehending the fleeing individual. This sentiment was reflected by other officers who were in a more restrictive department compared to others.

"I have mixed feelings uh, you know I understand the whole dynamic of you know, weighing out that you know the benefit of catching the offender versus you know the risk to you know them officers the public. But I think we should relax it a little bit."

-Officer, 33 years law enforcement experience

As discussed in the first theme, there is a belief that there is something beyond the basic infractions when someone flees. In the quote below, the officer talks about how their experience in a task force puts their personal belief at odds with policies that restrict pursuing small infractions. So as previously discussed in the policy section, officers like having guidance in the decision-making process, but hard restrictions can run contrary to what officers feel they should be doing.

"The more people run in these a lot of pursuits are based around like small infractions but we just we never know what is in that car what that person was doing and I kind of learned that from when I was at the task force of we would initiate have a car."

-Officer, 16 years law enforcement experience

Theme 4: Beliefs within the sphere of influence change and adapt over time

Over time, both the individual spheres of influence and the interaction between the spheres change. The driving forces of these changes come in part from personal maturation or other changes within themselves. A crucial transition period in which officers started to feel less inclined to continue pursuits until apprehension was expressed by one experienced officer to be at around 7 to 10 years. While this does not mean every officer experiences this transition, this was a generalization of how experience can impact an officer's decision to pursue a fleeing vehicle. Departmental policy changes over time do impact how officers decide to pursue these policy changes and are viewed by the public (either correctly or incorrectly). As policy changes and officer restrictions change, this can be in an official or unofficial capacity. Administrative leaders and higher-ranking officers may shift policies unofficially to accommodate current trends and cost management strategies. As policies shift, either officially or unofficially, officers discussed how it shifts the public's actions over time. These two quotes from officers describe how the actions of fleeing vehicles shift over time, either during the pursuit or in their willingness to flee.

"10 years ago, I never heard of people going to rarely heard people going the wrong way down the highways and stuff like that, with their headlights off.

Now it's all it's almost half the pursuits it sounds like it seems like they're trying to go the wrong way down or you know down a road and all that stuff in my mind I think it's because they figured out that that tactic works to get the cops to stop."

-Officer, 18 years law enforcement experience

“I’ve talked to quite a few people and you know criminals, they talk and they know that officers aren’t chasing and they just have to flee... you know I’ve had some guys joke with me when I’ve arrested them and they’re like, you know just commit a crime take off.”

-Officer, 2.5 years as an officer

4.4.2 Individuals who have fled:

4.4.2.1 Overview of Thematic Findings

As with law enforcement officers, the *lifeworld’s* impact on the decision to flee is characterized by multiple spheres of influence. For individuals who have fled in motor vehicle influences come from their legal and non-legal circumstances, the opinions, and feelings of the social network of the individual fleeing, and the desired outcome of the pursuit.

Theme 1: Fleeing individuals are influenced by legal circumstances when they decide to flee

When individuals who have fled in a motor vehicle reported the reasons for their most recent time fleeing, 13 of 20 respondents reported that they were intoxicated or high during their last pursuit. Beyond drugs and alcohol, outstanding warrants and canceled/revoked licenses were the most common responses with 7 and 8 individuals responding that these were the reason that they fled. A common outstanding warrant that people reported as a reason they fled was for a failed urine analysis (or UA). Warrants and license cancellations or revocations would result in the fleeing individual more than likely going to jail, so it feeds into preventing further consequences (Table 4-3).

Table 4-3. *Summary of Reasons for Fleeing Police During the Most Recent Attempt (n=20)*

Reason for Fleeing	n (%)
Canceled or revoked license	8 (40%)
Intoxicated or high	13 (65%)
Had drugs on them	6 (30%)
Warrant	7 (35%)
Fear	3 (15%)
Being on a motorcycle	2 (10%)
Were it someone else's car	2 (10%)

When interviewing public defenders, some of these legal implications that drove the individuals who fled to flee were because of inhibited decision-making by drugs and alcohol. One public defender in the quote below talks about how in their experience, drugs are more common and from a data collection perspective are undercounted because they are harder to identify if not immediately tested.

“I haven't had anyone that's drunk alcohol -- it's been meth and those are just harder for the state to approve it if they don't do it right on the front end. And normally they have other issues that they're already dealing less so, they don't take the time to investigate.”

– Public Defender, 3.5 years as public defender

Theme 2: The decision to flee is further concreted by an individual's non-legal circumstances

The non-legal circumstances on an individual's decision to flee the police is a product of their history with law enforcement along with some other influence from factors such as being on a motorcycle or being on a friend's or someone else's car.

Of the twenty individuals who were interviewed about their experience fleeing from the police, 12 (60%) of the individuals had previous interactions with multiple officers prior to their first time fleeing. 11 individuals reported negative interactions. These negative experiences were both experiences that happened to themselves, but also experiences that they witnessed happened to friends and family. Participants who reported that previous interactions with law

enforcement were either mostly positive or mixed (positive and negative) still held that interaction with law enforcement was not to be sought out. Even prior to the first attempt at fleeing, the interaction with law enforcement was seen to be avoided no matter how the history with law enforcement was described. The quote below directly references how one individual characterized this opinion.

“I would say positive... I mean, I think I’m not the type of guy, that you know, oh yeah I have a dislike for cops and I’m [not] seeking them out as friends or nothing but everybody’s got a job to do in this world.”

-Fleeing Individual, fled 3 times

This interaction continues as individuals experience interactions with law enforcement officers over the course of their life. One individual who had fled three times describes in the quote below how officer interactions leave them with a sense of “thirst” for conflict.

“It’s like they are thirsty, there’s a lot of cops especially in the cities that are just thirsty to get in in a high speed. Thirsty its wild, they’ll just follow you, follow you, one traffic infraction and *Whoop* ‘Come on I gotchu. I’m ready’. I literally, before I got into that high speed, I was in a car and literally this guy... following in [local area] then eight more came behind him just in case, you know, like okay I’m just gonna pull over then. Undercovers and all I was like, ‘wow, are you serious?’ like they’re just thirsty. Like they know that automatically it’s just the norm now. People are going at high speeds. Like, maybe if you weren’t so thirsty.”

-Fleeing Individual, fled 3 times

As these interactions occurred and individuals became more involved in the justice system the stress in these interactions did not numb. The stress over why you may be pulled over, the interaction with the officers, what officers may find in the vehicle, or, as described in the quote

below, what the officers may ask. Individuals who were interviewed described how in some cases, there is a feeling that officers approach a routine traffic stop with these individuals with a predisposition towards looking for a further infraction. This “profiling” leads to questioning and other actions that place the individual on the defensive. Fleeing as a reaction to avoid the source of stress seems to be common especially as interactions with officers increased over their lives. Some individuals did report a reduced desire to flee as legal situations cleared up and/or individuals who had fled grew older.

“I think that, I they [sic] don't think they should be allowed to ask those questions and because of person on [sic] automatically in fear, because if they answer the question ‘No, there isn't’. And then, they say, ‘Well, they don't mind if I search, search your vehicle if there's nothing in here, so you know now you're putting the person on you know well what you know what is a traffic you pulled me over for speeding, now you want to search my car and I think I think that that is A big reason why people put it in gear and step on the gas. You know it and make it a chase know because, for whatever reason, now they feel like you know I think those questions should not be allowed.”

-Fleeing Individual, fled 5 to 6 times

This profiling mentioned before was just one aspect of a feeling of aggression that individuals who had fled felt coming from officers in interactions that influenced their desire to flee. Examples came from how individuals experienced this aggression, ranging from questioning or officers following them to officers being ready to pull their firearm. One individual who had fled over eighteen times is quoted below describing how they felt this aggression stems from officers being too similar to individuals like himself, who act with aggression as opposed to assertiveness.

“None of that’s going to change if you keep on hiring m****r f****rs with the same psychological profile as me or adrenaline junkie ass m****r f****rs who are more aggressive than they are assertive. You know what I’m saying, because there’s cops out there, that are comfortable, cordial, assertive right that you can tell care about you, they don’t want to see the situation escalated and then there’s, which is majority of them, who are aggressive and they are the ones that are going to have more sway with this younger generation of police coming up and so that younger generation of police mostly is going to become more aggressive, even if the person naturally wasn’t aggressive to begin with”

-Fleeing Individual, fled 18+ times

“When you work with them, it’s sort of you know, instead of you know de-escalating sort of a very minor thing into something -- it sort of escalates because just don’t want to take. They’re losing control and they don’t want to take responsibility for any part of it not saying they necessarily should take full responsibility for any part of it, but yeah that’s kind of where their mind goes.”

-Defender, 2 years public defender experience

Beyond what individuals themselves had reported, when public defenders were interviewed, some similar concepts were mentioned that added to the non-legal circumstances that drive an individual’s decision to flee. The crux of many of these non-legal reasons described by public defenders is individuals fleeing are experiencing impaired judgment in some way, whether that be from substance use, development, or socioeconomic. Mental illness was a reason described by one public defender (quoted below) as being an impact beyond just fleeing, but not understanding the situation. Public defenders who worked with juveniles discussed how their clients’ brains are not developed to address long-term consequences that may result from fleeing the police; the juveniles only address the short-term consequence of not being caught for their current infraction. Another public defender (quoted third below) discussed how they receive training on the impact of poverty conditions can influence decision making for long-term

consequences as well. Where their socioeconomic status can provide hardship to the point that immediate consequences can cause much more harm than the long-term consequences of being caught by the police.

“Some mental illness cases where they saw you know they were part of working for law enforcement chasing someone else not realizing its them that’s being chased”

Public Defender, 9 years as public defender

“Kids they didn't necessarily give the most reasonable reasons, like objectively reasonable. A belief that, eventually, they could they can get away essentially but nothing, nothing like highly developed I don't think”

-Public Defender, 2 years public defender experience

“I think it's just more of like an you know, a lack of impulse control for a lot of our clientele that we deal with it's they just don't think in terms of Like consequence, in the long run versus just trying to escape it for the time being and I mean we do a lot of trainings on how poverty kind of impacts, you know our clients in that regard, at least where they aren't able to see beyond just surviving the day versus like how are like you know proceed later on in life”

-Public Defender, 8 years as a public defender

Theme 3: Social narratives in the fleeing individuals’ life influence the decision to flee, but typically after the first attempt

Individuals who had fled previously were asked how their friends and family viewed fleeing from police in the motor vehicle and responses varied across participants of which aspects of their social circle influenced the decision-making in a pursuit scenario. Respondents who did discuss fleeing with their social circles more commonly responded their friend groups agreed with

fleeing from the police and family disagreed with fleeing as stated in the first quote below. One of the reoccurring reports from individuals who had fled was that many of the opinions around whether someone should flee or not did not start being discussed until after the first time that the individual fled. Much of this discussion trends towards what some of the non-legal personal influences included. As shown in the second quote below, there is a fear of, or drive to avoid interaction with police, as a point of view that is being shared as a part of these individuals' social circles.

“So-some family members, I mean they disagree with it they don't believe you should run from the police you should pull over, most of my friends would agree that you should run.”

-Fleeing Individual, fled three times

“Some would stop some thought it was the best way to flee some just said to get away from the police before they fuck you up”

-Fleeing Individual, fled twice

Theme 4: During the pursuit, decisions to flee are influenced by the outcomes desired. How an individual desires the pursuit to end will guide the decisions and actions that are made over the course of the pursuit. Goals for the pursuit are influenced by but separate constructs from the previous spheres of influence. Individuals who had fled previously reported that while they were fleeing, their primary goals were to get away and do so in a way that maintained safety for the individual and the surrounding community. Legal issues and non-legal influences such as fear of from police, both molded a bit of how individuals envisioned these goals. How obtainable these goals were in individuals' minds depending on their previous experience

fleeing. One individual who had fled 18+ is quoted below discussing how their confidence in fleeing due to their mindset and experience with this methodology of escaping.

“I mean I’m an optimist and I believe that you should manifest what you want in life, man. So, I manifest I’m gonna f**king go bend f**king 3, 4, 5 corners, until I feel like I’ve gotten this dude around enough corners to where even if I f**king go as slow as I possibly can to park this vehicle and get out of it.”

-Fled 18+ times

Other individuals, especially those who had less experience or had been caught previously were less likely to hold as high of confidence in the outcome of getting away. Hope remains for the desired outcomes in those with less confidence, however, as described in the quote by the individual below who had fled twice previously.

“I was hoping to get away but I mean it could have ended with me being arrested. Good chance of that always when you flee.”

-Fled twice

4.4.3 Further Themes from Public Defenders:

Theme 1: Based on the experiences of their clientele, public defenders push back on the current practices of pursuits amongst law enforcement

Interviews with public defenders did lead to one aspect of the pursuits that was not directly an aspect of the decision-making that was also described by fleeing individuals but was a more overarching experience based on repeated observations of pursuit incidents involving their clients. Public defenders expressed concern over the safety of the public in pursuits, especially in scenarios where officers have already ascertained license plate numbers, as described in the first quote below. Some public defenders suggested alternative methods of apprehension. One

individual discusses in the second quote below a situation that which they feel systems they have seen in other cities could be of use, in this case a camera system.

“You know, like you've got the license plate number you got something you'll probably be able to catch them like don't contribute to this like super dangerous situation where you're putting a bunch of other you know innocent drivers at risk or you know people who are walking down the sidewalk or you know lots of people that are just you know around the areas it's a ... it's a crime that happens, more publicly than crimes, and so I think. You know it's dangerous it is dangerous.”

-Public Defender, 3 years as public defender

“They just track them on the cameras and set the cops up and then trap them... it's so much safer and I would so much rather see the money go into something like that.”

-Public Defender, 9 years as public defender

Public defenders who worked with juveniles discussed an additional area where law enforcement is falling short, and that is not understanding the relationship and views of the juveniles in relation to law enforcement. One public defender talked about detention hearings being a point of stress for kids and their families. There is a distrust with the family not preventing the juvenile from being in a fleeing situation again, which results in the juvenile being held for “a few to several days”. Another public defender in the quote below about how the kids they work with have a dual vision of police officers in their minds.

“So my kids both are scared of cops and hero worship cops in the same brain. I would love to see a dialogue open. That allows cops and my kids to openly and honestly do some restorative justice, sit at the same table talk about

experiences without getting like whoa I didn't do that you know for on either side.”

-Public Defender, 9 years as public defender

4.5 DISCUSSION:

Over the process of a pursuit, involved parties must make split second decisions while under a hot cognitive state. The factors that go into this decision-making come from the experiences that constitute the *lifeworld* in which an individual exists. Across both participating groups, personal and environmental factors encompass the spheres of influence that make up an individual's *lifeworld*. Officers rely on the combination of their past experiences along with their departmental policy to decide the worthiness of pursuing or continuing to pursue a fleeing motor vehicle. From the fleeing individual's perspective, their current legal circumstances along with their non-legal circumstances such as their social network's narrative on fleeing and their own experience with law enforcement in the past shape the decision-making in the initial thought to flee, with the desired outcome of the pursuit influencing the tactics utilized once the pursuit has started. Everyone making the decision to flee or pursue is not making the decision in a vacuum. However, although the influences behind the decision may be numerous and complex, the core of the decision made is binary, flee or do not flee, pursue or don't pursue. Depending on the scenario that the fleeing individual is in, there is no decision, to flee or not flee, it is an outcome of getting caught or escaping. Similar to findings found in interviews with auto thieves from Cherbonneau and Jacobs (Cherbonneau & Jacobs, 2019). The findings from these interviews show the complexity of these binary decisions. Deeply entrenched and practiced opinions and habits formulate whether the switch is flipped or not. These are not unshakeable though. Legislation, policy changes, and improved communication between law

enforcement and the public could help shape some of these decisions to help reduce the number of instances where a pursuit feels like a viable solution.

Previous interviews with law enforcement officers in Alpert, 1998 found decision making points to be in line with much that is covered by the policy sphere of influence, with location and other environmental factors, along with crime severity. The approach of this study aimed to build upon that by adding personal experience and the interaction between prescribed and personal decision making. The concept of the *lifeworld* goes beyond the findings of previous research to add some depth beyond just risk factors but provided context as well.

Findings from public defenders and individuals who fled add some credence to a feeling that there could be changes made to law enforcement practices to help reduce the desire or need to pursue. Fleeing individuals discussing the sense of aggression from officers as a reason to avoid interaction could be assisted with de-escalation practices. Alternative approaches to apprehension and improved handling and relations with individuals at an earlier age were both mentioned by public defenders. While the former would only help reduce the number of pursuits, the latter could help with the potential of reduced officer and public conflict across other interactions as well.

This study looked at a range of individuals who are involved with pursuits to try and get a fuller story of pursuits and pursuit influences. While the readers and researchers of this study may be privy to this collective information, bringing officers and community together to better understand the experiences each experience, and the expectations of interactions could help achieve reduced stress in interactions. Alternative approaches to apprehension such as

StarChase, cameras, and roadblocks would also allow for officers to adequately have the tools to do their jobs while increasing the safety of the public.

4.5.1 Limitations

The population of this study stems from the limited population that was reached. All individuals reflect their feelings from one state. Additionally, through the restraints of the study, only currently incarcerated individuals were interviewed for information from fleeing individuals. This was due in part to the difficulty of confirming that someone in the larger public had fled but biased the results towards themes and influences more pervasive in individuals who are justice-involved. Saturation was believed to have been met at the interviews done for Minnesota law enforcement and public interaction, but other themes may appear in studies working in a different population.

4.5.2 Conclusion:

Individuals who are involved with pursuits whether as the pursuing law enforcement officer or the fleeing offender both make their respective decisions to be involved based on prior experience in the law enforcement/public interaction along with other non-legal factors within the moment. Findings from this study show interaction points that can bring understanding and intervention into police pursuits to provide a safer community.

5 LAW ENFORCEMENT POLICY ON POLICE PURSUITS OF MOTOR VEHICLES IMPACT ON PURSUITS AND OUTCOMES

5.1 ABSTRACT:

Objectives: How the police policy impacts the number and outcomes of police pursuits is important to understanding how to improve community safety amongst the officers, offenders, and the community. This study aims to understand how different perceived policy restriction impacts the number of pursuits an agency reports in a year, and how a decision-making guide within an agency can change the outcome of pursuits.

Methods: Perceived policy categories were collected from local and sheriff agencies around the state using an online survey. A more in-depth interview was conducted with Minnesota State Patrol to understand finer details of how a multi-district agencies policy changed over time. Local and sheriff agency perceived polices were compared to the total number of pursuits reported to the Bureau of Criminal Apprehension within a year in mixed effect modeling. While mixed effect modeling was used to understand how a 2019 decision-making guide impacted the proportion of State Patrol's pursuits ending due to a discontinuation or non-initiation on the part of involved officers and supervisors. Incident level data was provided by Minnesota State Patrol for this model.

Results: Pursuit policies have been perceived to become more restrictive over time. Agencies who reported the most restrictive level of policy were associated with a 43% reduction in the rate of pursuits as compared to the lowest perceived level of restriction. The proportion of pursuits by State Patrol resulting in a law enforcement discretionary decision was increasing prior to the policy change and continued to increase at a similar rate after the change.

Conclusion: This study shows that policy changes can make an impact on pursuits in terms of frequency and outcome. However, further research needs to be conducted to better understand what specific policy and cultural changes can improve pursuit outcomes and frequency while still allowing law enforcement to fulfill their responsibilities.

5.2 BACKGROUND:

Police pursuits bare a burden of injury on not only drivers and pursuing officers but passengers, bystanders of the pursuit and property as well. Nationwide in 2020, there were 464 fatalities from crashes that involved the police pursuit of a motor vehicle (FARS). Law enforcement's pursuit of motor vehicles has increased in Minnesota from 2012 to 2022. The Uniform Crime Report (UCR) distributed by the Minnesota Bureau of Criminal Apprehension (BCA) showed that the total number of pursuit reports rose from 847 in 2012 to 3109 in 2020. In 2020, these pursuits resulted in 10 fatalities, including one officer, along with 39 serious injuries, 113 minor injuries, and another 170 possible injuries (Harrington et al., 2020). Altogether, 1 in every 10 reported pursuits resulted in some level of injury. On top of these injuries, 1128 pursuits resulted in property damage. As this potentially injurious driving activity has risen in the state, the decision-making factors that lead to the occurrence of a pursuit need to be understood to create a safer community. One factor that plays into the decision-making process for pursuits is a law enforcement agency's policy about when to engage in the pursuit of a motor vehicle and how the pursuit should be conducted.

Prior research has been conducted to classify pursuit policies and understand policy's impact on pursuits within a law enforcement department. To greater understand pursuit policies within the scope of law enforcement research, three classifications of were developed in past literature by Fennessy and colleagues in 1970 and 1972 and were further used in studies by Alpert (Alpert, 1987; Fennessy et al., 1970; Fennessy & Joscelyn, 1972). The three models range from the least restrictive on officer decision-making, leaving it mostly up to an officer's judgment to outright discourage the pursuit of motor vehicles outside of extreme circumstances. Models that would be considered "Judgmental" allow major decisions during the pursuit and the initiation of the

pursuit to be decided by the officer. "Restrictive" policies add decision-making guides for and restrictions on officers engaging in and initiating pursuits. The most restrictive of the three categories, "Discouragement" policies, move beyond guidance to cautioning against or actively discouraging officers from pursuing motor vehicles barring extreme circumstances. A study using data from the Houston Police Department in 1987 addressed the introduction of a pursuit policy saw a reduction of 40% in pursuit incidence (Crew, 1992). Crew within the study stated that Houston's adopted policy would have been classified as "Judgmental", the least restrictive of the policies, but just the presence of the policy and the decision-making guides provided led to a decrease in pursuits. Another study expanded upon these three levels by expanding "Judgmental" and "Restrictive" policies into two categories each (Kennedy et al., 1992). Pure and limited judgment policies are differentiated by limited "Judgmental" policies requiring close supervision over the pursuit but still have the aim to apprehend excessive risk. Pure "Judgmental" policies only have restrictions on pursuits in the presence of unreasonable or disproportionately dangerous actions by the officer. "Restrictive" policies were split into mild and severe categories, with mild policies allowing for the pursuit of any infraction but putting the onus on the officer to minimize risk even at the cost of not enforcing the law. Severe "Restrictive" policies include restrictions on the infractions that can be pursued and further restrict the processes of a pursuit. Additionally, severe policies add justification for pursuits being required in reports and reduce the backlash when an officer does not initiate a pursuit. Each increase in restrictiveness increases the burden on the officer and supervisor in the moment, but also heightened the ability for review of the decision making after the incident, but no specific review process is outlined by the policy classifications within Kennedy and colleagues. A national survey of policies for city and county-level agencies in 1997, found city-

level agencies: 52% were judgmental, 43% were restrictive and 5% were discouragement, while county-level agencies were: 59% judgmental, 39% restrictive, and 1% discouragement (Kenney & Alpert, 1997). In a prior study, data originally collected from 436 law enforcement agencies by Kenney and Alpert was reanalyzed to investigate the relationship between pursuits and pursuit outcomes with four scales addressing police pursuit restrictiveness, policy restrictiveness, training thoroughness, and evaluation restrictiveness. These scales were created utilizing data the survey instrument which included 50 items pursuit policies, data collection practices, training, and investigation/discipline procedures (Becknell et al., 1999; Kenney & Alpert, 1997). Across the four scale measures, regression showed a reduction in pursuits per officer as the restrictiveness, evaluation, and training increased. Additionally, increased police pursuit restrictiveness resulted in the reduction in rate of use of force.

Currently, there are no required restrictions on police pursuits in Minnesota other than departments are required to have a policy. Instead, the Minnesota Board of Peace Officer Standards and Training (POST) created a model policy that department policies “must at a minimum, comply with [in terms of] requirements” (MN statute 626.8458, model policy available in Appendix 1: Minnesota Peace Officer Standards and Training Vehicle Pursuits Model Policy). While this model policy does supply general considerations and guidelines for how pursuits should be conducted, however, there are no hard restrictions prescribed in terms of scenarios or infractions that should not result in a pursuit, outside of termination of a pursuit being required in the case of communication break or supervisor order. Without clear restrictions, only the general decision points, the model policy starts at a baseline of what would be considered a “judgmental” policy; however, departments can add restrictions and oversight. As the decision to pursue comes to fruition, however, how an officer perceives the

restrictiveness of a policy takes precedence over the true restrictiveness classification. The perceived restriction is what constrains the decisions made by the officer in the moment of pursuit. The main purpose of this study is to analyze the associations between perceived policy classifications as reported by local and sheriff-level Minnesota law enforcement agencies and the number of pursuits reported under those policies. The methods of this study will take a “best case scenario” by reaching out to the primary contacts at departments to classify their restrictiveness of their policy before and after their most recent policy update.

Additionally, this study will examine the impact of a change in policy within the Minnesota State Patrol on the increasing level of pursuits that were resolved in discontinuation or non-initiation by troopers. Due to the scale and operating procedures of individual troopers within the Minnesota State Patrol, different methodologies will be employed to understand how the most recent policy update affected the outcome of pursuits conducted by State Patrol. Both aspects of this study will help understand how pursuit policy restrictions currently affect pursuits in Minnesota.

5.3 METHODS:

Data gathered for this study addresses two hypotheses. The first is that each step up in perceived policy restrictiveness will result in a decrease in reported pursuits a year within.

Secondly, the introduction of a more specific decision-making guide will result in discontinuations and non-pursuits occurring at an increased rate.

This study protocol was approved by the University of Minnesota Institutional Review Board (STUDY00011188 and STUDY0010932).

5.3.1 Recruitment and Data Sources

5.3.1.1 Policy Characteristics

5.3.1.1.1 Local and sheriff agencies

A Qualtrics survey was distributed to each law enforcement agency across the state to collect policy perceptions. Emails were sent from the Office of Traffic Safety and Target Zero Deaths to individuals who were knowledgeable and/or directly involved in the policy process. The survey was sent out in two waves, the first wave on December 17th, 2020, and the second wave on March 3rd, 2022. The first wave's last response was October 2021, and the second wave was closed on March 31st, 2022. Between both waves, 137 agencies responded to the survey. For State Patrol, an interview was done to discuss policy changes from 2015-2020.

Due to model policy and the openness of the policy, to better understand the decision-making of the departments themselves policies were not collected and individually analyzed/categorized. Thus, this study does not use policy analysis methods. Instead, the recipient at agencies were asked to classify their current policy and the policy prior to the current policy into one of three categories (Alpert, 1987; Fennessy et al., 1970). These categorizations represent the perceived restrictiveness of the departmental policy. The perceived restriction is the measured exposure in this study, as how officers perceive restriction will drive the decision making more than the true categorization. The potential categories for departments to choose were:

- **Judgmental:** Limited restrictions allow officers to make major decisions related to initiation, tactics, and termination.
- **Restrictive:** Officers' judgment and decisions are more restricted, often requiring supervisory input regarding continued pursuits, tactics, and termination.

- **Discouragement:** Cautioning or discouraging any pursuit except in extreme situations.

The three-category system was utilized instead of the five categories (when restrictive and judgmental are each split into two further categories) to ease the completion of the survey through a simplified classification. The concern with expanding to five categories would be increased noise and reduced response rate. An “Other” category was included as a response option, with the ability to self-describe the department policy if the respondent did not feel their policy fit within one of the three categories.

5.3.1.1.2 State Patrol

Policy changes of the Minnesota State Patrol were not adequately captured by the initial survey that was important to the research question, an alternative method of survey completion through an interview with knowledgeable members of the State Patrol. Due to the wide and unique authority of State Patrol, understanding how policy impacts pursuits conducted by State Patrol was too important to miss. Due to the time commitment of this interview-based collection and an established contact, it was only conducted with State Patrol and was not conducted with other agencies that did not respond. For the years from 2015-2020, State Patrol members were asked to characterize the policy changes that occurred during that time. Three policy changes occurred during this time, in 2016, 2017, and 2019, and each written policy was provided to the researchers. Of the three policy updates, the May 2019 update contained the most changes and included the introduction of a decision-making guide for troopers to assist with the risk assessment in the pursuit of a motor vehicle, State Patrol also reported changes in training. The guide and additional training changes aimed to restrict and encourage the discontinuation of pursuits.

5.3.1.2 *Outcome:*

5.3.1.2.1 *Local and sheriff agencies*

Amongst the local agencies and sheriff departments, the primary outcome is the number of pursuits reported by the department on an annual basis per 10,000 individuals in the county the agency serves. The number of pursuits agencies reported participating were obtained from yearly UCRs published by the Minnesota BCA. Pursuits initiated, assisted, and total pursuit involvement are contained within these reports and for the purposes of this study, the number of pursuits for an agency will be identified as the total number of pursuits reported. Population data from the county was obtained from United States Census estimates.

5.3.1.2.2 *State Patrol*

Individual pursuits were identified through a combination of case numbers and Computer Assisted Dispatch (CAD) event identifiers. Unique events that had multiple reports had the driver reports from the primary officer involved in the pursuit, with a variable created to preserve the information of how many officers and fleeing individuals were involved in the pursuit. The report from an assisting officer was retained instead if there was only a report from an assisting officer and no primary officer. Reports were available from June 2018 to July 2021. Reports were collapsed by the district in which the incident happened and by the reason for termination for each quarter of a year in the time between June 2018 and July 2019. Pursuits that ended due to “No Initiation”, “Officer Discretion”, or “Supervisor Discretion” were combined as the primary outcome of the analysis. The total number of reports per district was also recorded. Each quarter was marked as before or after policy 2019 policy update. Reports that were in Q2 of 2019 were split into Q2 pre-update and Q2 post-policy as two separate time points. Q2 of 2018 only contained data from one district so was dropped from the analysis.

5.3.2 Confounding factors

5.3.2.1 *Local and sheriff agencies*

To account for increases in overall crime (particularly major crimes reported by the UCR) and its potential effect on the number of police pursuits, crime rate was included as an adjusting variable. UCR provides crime rate data via the “offense trend” data. “Offense trend” data is a set of statistics for selected major offenses (murder, arson, larceny, etc.) including the number of reported and actual incidents of each type. Only actual events were used for calculating crime rates within the agency. Crime data was the only adjusted variable as the random effect regression (described in the next session) accounts for much of the other effects that are correlated with an individual agency such as the income of a jurisdiction and racial breakdowns.

5.3.2.2 *State Patrol*

Adjustment for crime rate led to convergence problems within State patrol data so was not included as an adjusting variable. Random intercepts for State patrol districts will help account for correlated variables as with the local and sheriff agencies.

5.3.3 Analysis

5.3.3.1 *Local Agency and Sheriff Departments*

Based on responses to the survey with local agencies and sheriff departments, policies for a particular year 0 were determined based on being prior to or post the most recent policy change for an agency. Each year before the policy change at an agency was considered to have the prior policy, and each year after, to have the current policy. In the year in which policies changed, if policies were changed with less than six months left in the year, the year was counted as having the prior policy. If the policy was enacted prior to the end of June, the year was counted as using the current policy. A variable was created to indicate that that year was a year in which a policy change occurred. However, if the policy changed in November or later, the year was marked as

not having a policy change. These cutoffs and new variables were chosen to best account for changes in the year while considering at what point in the year a policy change will impact the count. In some cases, only a prior policy was listed, in this occurrence the agency was only included during years prior to the reported update. The first wave received 86 responses and the second received 54 responses. Seven departments responded to both waves. If a department responded multiple times, the first complete response was kept, and the other responses dropped. The final sample size of analyzable agencies was 115 after removing agencies that did not have available pursuit data.

For the local agencies and sheriff departments, descriptive statistics of demographic variables for the counties in which agencies resided along with crime rates and reported pursuits as reported by UCR were run by year. Mixed effect Poisson regression modeled the total number of pursuits that an agency experiences in a year based on the policy category for that year. The model used a random intercept for each agency to account for the repeated measurement of pursuits each year within an agency. To account for the size of the county and the total interactions an agency may have, an offset of the county population was used in the model. The model was also adjusted for the year, policy changes in the year, and crime rate. Crime data was missing for some departments for each year due to changes in reporting practices or missing crime data for that year. Multiple imputations by chained equations were utilized to impute data for missing crime data. This analysis used 100 imputations on the 115 agencies that had complete policy data.

Sensitivity analysis was run for the regression modeling regarding the inclusion or exclusion of years with policy changes. No difference in the estimates was found in the sensitivity analysis, so the years with policy changes were left in the sample.

5.3.3.2 *State Patrol Policy Analysis*

An interrupted time series analysis using mixed effect Poisson regression was utilized to measure the association between the rate at which the proportion of pursuits that ended by discontinuation or non-initiation changed before and after the 2019 policy update. Random intercepts were used for each State Patrol district to adjust for repeated measurements within districts. Time in the analysis was in the form of quarters of a year. The total incidents reported by a district in the quarter was utilized as an offset for the count of non-initiated and discontinued pursuits. An interaction term between the policy change and time variables measured the rate change in the proportion of pursuits that were not initiated or discontinued changed. Point estimates of the rate ratio for the time variable were compared using the interaction to address the hypothesis that the policy change impacted the rate that the proportion of pursuits ending in non-initiation and discontinuation changed. This hypothesis was chosen over just a change in proportion due to the initial policy changes in 2016 and 2017 already potentially impacting the proportion of interest prior to the available data period. Predicted proportions of pursuits that were non-initiations or discontinuations were calculated by using regression values to predict a count of discontinued and non-initiated pursuits and dividing by the total number of pursuit reports reported by the district for that quarter. If this predicted proportion was greater than one, it was restricted to one as proportions cannot be greater than one.

5.4 RESULTS:

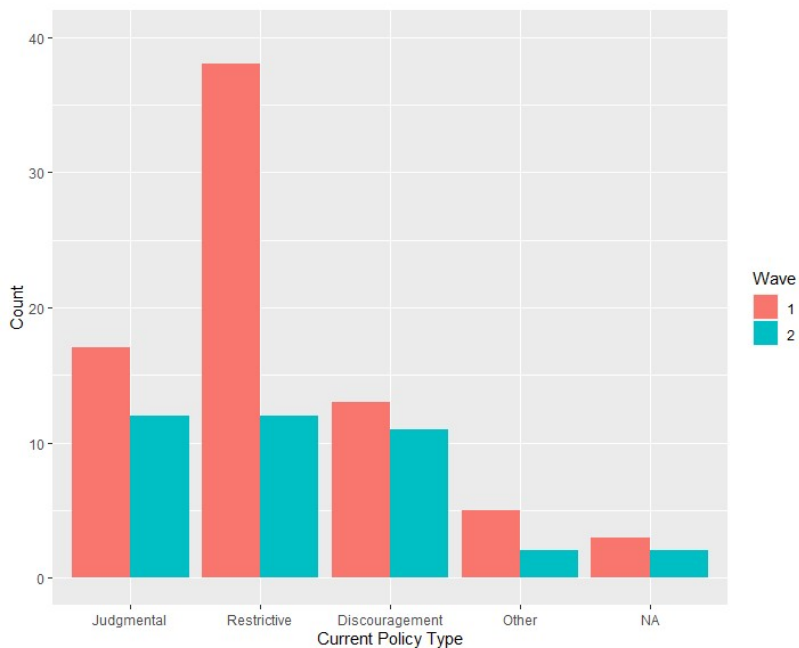
5.4.1 Local Agencies and Sheriff Departments

Table 5-1 Descriptive Statistics of Local Minnesota Law Enforcement Agencies and County Sheriffs with Policy Data

Variable	2015, N = 115 N (%)	2016, N = 115 N (%)	2017, N = 115 N (%)	2018, N = 115 N (%)	2019, N = 115 N (%)	2020, N = 115 N (%)
Agencies by County Population						
<i>Less than 15,000</i>	18 (15.7)	18 (15.7)	18 (15.7)	17 (14.8)	18 (15.7)	18 (15.7)
<i>15,000 to 34,999</i>	24 (20.9)	24 (20.9)	24 (20.9)	25 (21.7)	24 (20.9)	24 (20.9)
<i>35,000 to 149,999</i>	29 (25.2)	29 (25.2)	29 (25.2)	29 (25.2)	29 (25.2)	29 (25.2)
<i>150,000+</i>	44 (38.3)	44 (38.3)	44 (38.3)	44 (38.3)	44 (38.3)	44 (38.3)
Agencies by Total Crimes (per 1,000 people in County)						
<i>0.5 or less</i>	24 (20.9)	26 (22.6)	28 (24.3)	30 (26.1)	30 (26.1)	29 (25.2)
<i>0.51 to 2.5</i>	27 (23.5)	26 (22.6)	24 (20.9)	28 (24.3)	28 (24.3)	32 (27.8)
<i>2.51 to 5</i>	19 (16.5)	27 (23.5)	23 (20.0)	27 (23.5)	31 (27.0)	24 (20.9)
<i>Over 5</i>	39 (33.9)	30 (26.1)	37 (32.2)	27 (23.5)	25 (21.7)	30 (26.1)
<i>Missing</i>	6 (5.2)	6 (5.2)	3 (2.6)	3 (2.6)	1 (0.9)	0 (0.0)
Agencies by Community Average Median Income						
<i>Less than \$75,000</i>	53 (46.1)	59 (51.3)	34 (29.6)	32 (27.8)	19 (16.5)	4 (3.5)
<i>\$75,000 to \$84,999</i>	19 (16.5)	11 (9.6)	28 (24.3)	27 (23.5)	31 (27.0)	27 (23.5)
<i>\$85,000 to \$94,999</i>	22 (19.1)	18 (15.7)	25 (21.7)	13 (11.3)	20 (17.4)	35 (30.4)
<i>\$95,000+</i>	21 (18.3)	27 (23.5)	28 (24.3)	43 (37.4)	45 (39.1)	49 (42.6)
Agencies by Policy Category						
<i>Judgmental</i>	53 (46.1)	53 (46.1)	50 (43.5)	49 (42.6)	48 (41.7)	41 (35.7)
<i>Restrictive</i>	36 (31.3)	36 (31.3)	38 (33.0)	38 (33.0)	40 (34.8)	41 (35.7)
<i>Discouragement</i>	15 (13.0)	16 (13.9)	16 (13.9)	17 (14.8)	17 (14.8)	22 (19.1)
<i>Other</i>	11 (9.6)	10 (8.7)	10 (8.7)	9 (7.8)	8 (7.0)	6 (5.2)
<i>Missing</i>	0 (0.0)	0 (0.0)	1 (0.9)	2 (1.7)	2 (1.7)	5 (4.3)
Agencies by Agency Involved Pursuits						
<i>Zero</i>	25 (21.7)	21 (18.3)	24 (20.9)	27 (23.5)	20 (17.4)	14 (12.2)
<i>1 to 5</i>	56 (48.7)	57 (49.6)	52 (45.2)	50 (43.5)	52 (45.2)	43 (37.4)
<i>6 to 10</i>	27 (23.5)	19 (16.5)	23 (20.0)	18 (15.7)	20 (17.4)	24 (20.9)
<i>10+</i>	7 (6.1)	18 (15.7)	16 (13.9)	20 (17.4)	23 (20.0)	34 (29.6)

Of the 115 local law enforcement agencies and county sheriff departments analyzed in this study, the number of agencies with missing crime data fluctuated yearly (Table 5-1). Overall, the lower crime rate (categories (below the top category of over 5 crimes per 1000 people) increased over time. Across the agencies, the counties where responding agencies were located showed an increase in average median income. Sheriff departments and local agencies policy updates indicated a rise in “Restrictive” and “Discouragement” policies over time. The upper categories of initiated pursuits increased in prevalence over time.

Figure 5-1 Current Agency Policies by Wave of Survey (n=115)



When looking at what the current perceived pursuit policy restrictiveness. Departments that responded in the first wave of the survey showed local law enforcement agencies and sheriff’s departments are predominantly using policies that they classified as “Restrictive” as their current policy (Figure 5-1). The local and sheriff agencies that responded in wave two were

much more evenly distributed among the three categories when it came to their current policy; however, overall “Restrictive” was still the most common level of perceived policy restriction.

Five agencies only listed their prior policy and so are reported as missing for their current policy.

Figures

Figure 5-2 give more context to the policies in the departments that responded by showing shifts in policy for the most recent updates. More policies moved away from “Judgmental” policies than remained at this lowest level of restriction. More departments shifted to “Restrictive” policies than “Discouragement”, and only a few policies moved from “Restrictive” to “Discouragement”.

Figure 5-2 Agency Responses for Policy Classification Changes 2015-2021 (n=115)

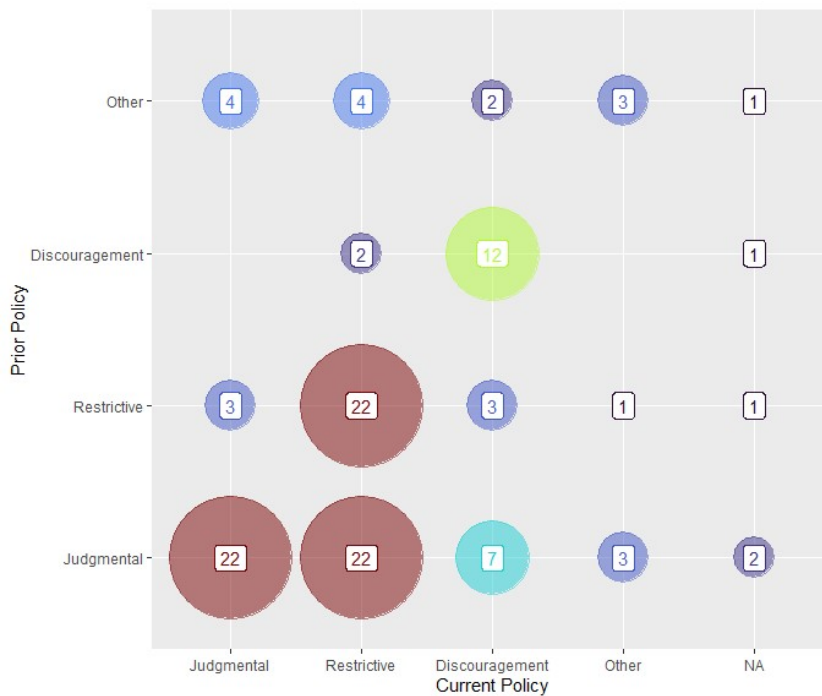
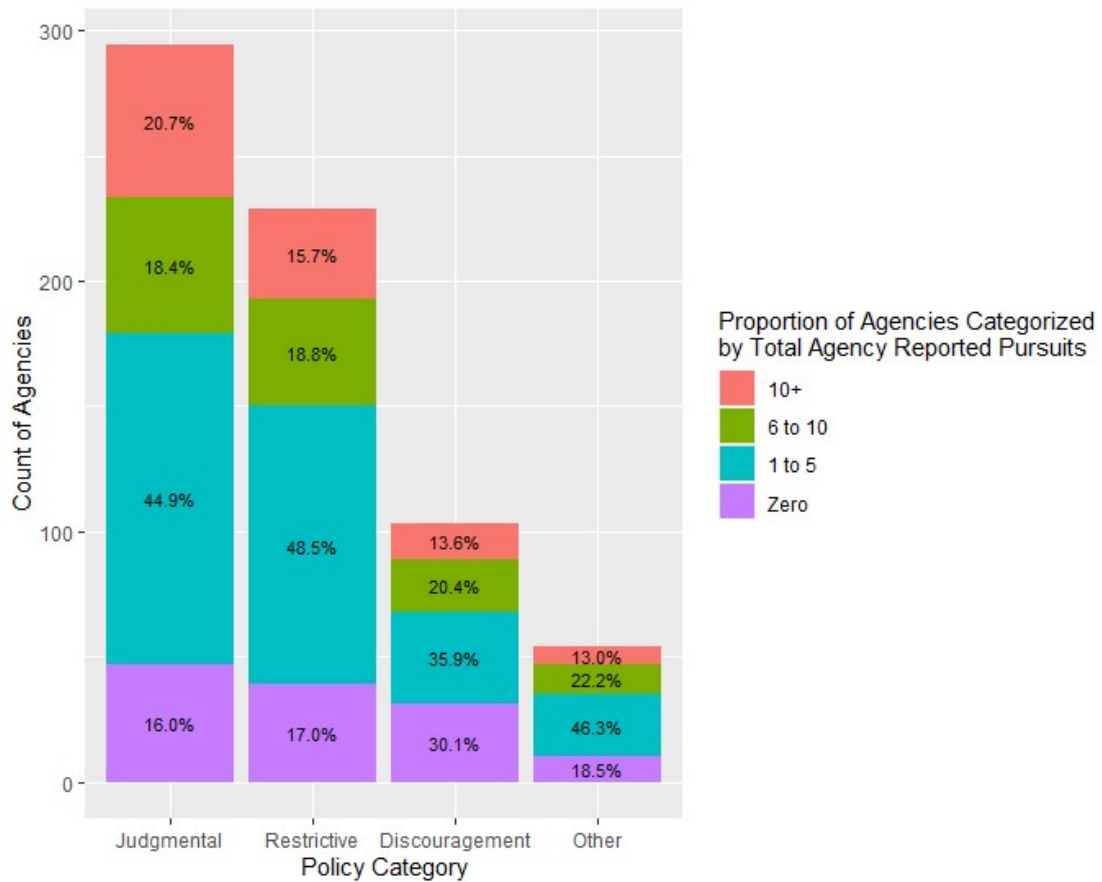


Figure 5-3 Pursuits by Policy Category



For each year of agency data, when agencies were perceived to have “Judgmental” policies, 60.9% reported 5 or fewer total pursuits (Figure 5-3). In perceived “Restrictive” policies, 65.5% of departments reported 5 or fewer pursuits, and 66% of departments with perceived “Discouragement” policies reported 5 or fewer pursuits. Agencies with “Discouragement” policies showed a smaller proportion of agencies that reported 10+ pursuits each year. While “Restrictive” had a slightly higher proportion of agencies that reported 10+ pursuits (15.7%) compared to “Discouragement” (13.6%), the proportion was still lower than agency years with “Judgmental” policies (20.7%).

Table 5-2 Risk Ratio of Increased Pursuits based on Policy Category

Policy Category	RR	95% CI
Crude		
Judgmental	---	---
Restrictive	1.07	0.84, 1.36
Discouragement	1.17	0.87, 1.56
Other	0.73	0.46, 1.15
Adjusted		
Judgmental	---	---
Restrictive	0.93	0.69, 1.26
Discouragement	0.57	0.37, 0.89
Other	1.05	0.51, 2.13

*Offset by population; Adjusted for year, policy changes in the year, and crime rate

In years where agencies classified themselves as “Discouragement” policies, agencies reported 0.57 [95% CI 0.37-0.89] times the incidence of pursuits compared to agencies that reported a “Judgmental” policy (Table 5-2). “Restrictive” policies had 0.93 [95% CI 0.69-1.26] times the incidence of “Judgmental” policies. In instances where agencies felt their policy did not lie within the three initial categories, “Other”, the incidence was 1.05 times [95% CI 0.51-2.13] times the incidence of pursuits in “Judgmental” policies.

5.4.2 State Patrol Policies

Table 5-3 State Patrol Pursuit Reports: Frequencies of Termination Reasons

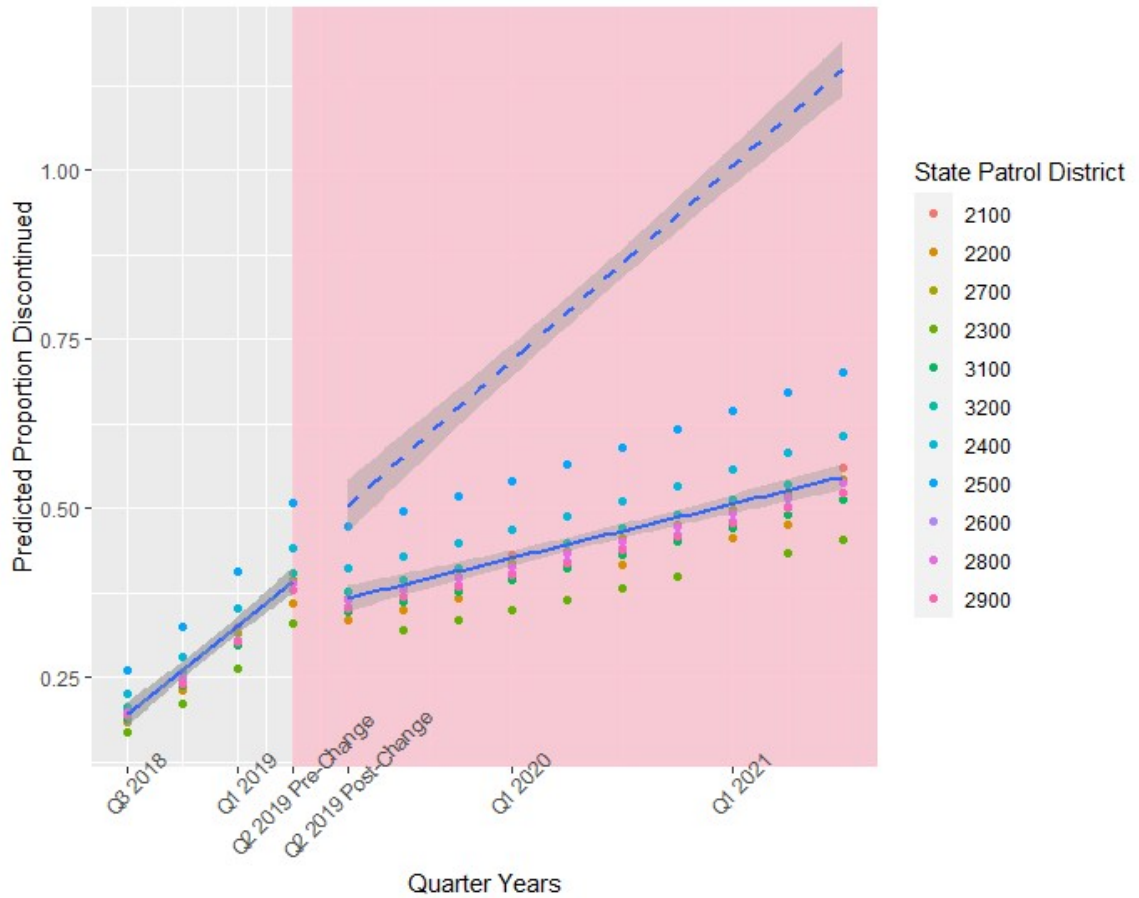
	2018 (Starts in June)	2019	2020	2021 (Ends in July)
Total Pursuits	N = 174	N = 408	N = 722	N = 420
	N (%)	N (%)	N (%)	N (%)
Cause of Pursuit Termination				
<i>Pursuit Termination Technique</i>	47 (27.0%)	100 (24.5%)	134 (18.6%)	68 (16.2%)
<i>Violator Stopped</i>	45 (25.9%)	75 (18.4%)	81 (11.2%)	48 (11.4%)
<i>Discontinue or No Initiation</i>	45 (25.9%)	166 (40.7%)	377 (52.2%)	245 (58.3%)
<i>Unintentional Crash</i>	16 (9.2%)	34 (8.3%)	83 (11.5%)	39 (9.3%)
<i>Other</i>	21 (12.1%)	33 (8.1%)	47 (6.5%)	20 (4.8%)

The proportion of pursuits that ended due to a discontinuation or non-initiation increased across state patrol from 25.9% of pursuits in the second half of 2018 to 58.3% in the first half of 2019. Likewise, within the regression model, prior to the policy change districts reported the proportion of pursuits that were “not initiated” or “discontinued” increased by 1.25 [95% CI 1.03-1.52] times per quarter on average (Table 5-3). After the policy change, the proportion increased by 1.04 [95% CI 0.97-1.12] times per quarter. The change in the rate in the time after the policy update was an average decrease of 0.84 [95% CI 0.69-1.02] per quarter for the time points following the policy change compared to before the change. Figure 5-4 shows the predicted proportions based on the regression model. The red area shows the predicted slopes observed when the policy change occurred (solid line) and the counterfactual of no change in policy with the dotted line (dotted line). This graph shows before and after the policy update the proportions continue to increase. Based on the regression model, the change in the slope between the counterfactual and the observed slope there is not enough evidence to say there is a difference.

Table 5-4 **Incident Rate Ratios of Pursuits Ending from No Initiation or Law Enforcement Discontinuing**

Model Period	Exposure	IRR	95% CI
Pre-Policy Update	Quarter-year	1.25	1.03, 1.52
Post-Policy Update	Quarter-year	1.04	0.97, 1.12
Interaction Between Policy and Time		0.84	0.69, 1.02

Figure 5-4 Interrupted Time Series with Slope Change Pre- and Post-State Patrol Policy Change



(District map: <https://dps.mn.gov/divisions/msp/contact/Pages/district-index.aspx>)

Lines: The solid line is the predicted regression line; the dotted line is counterfactual following the trend before the policy change

5.5 DISCUSSION:

Pursuit policy has become more restrictive in recent years for local and sheriff-level law enforcement agencies in Minnesota. According to the data from the pursuit policies categorized by the local law enforcement agencies and sheriff’s departments, the more restrictive policies were associated with fewer pursuits, however only when pursuits were restrictive enough to be considered “Discouragement” levels. Prior research had looked primarily at introducing a formalized pursuit policy rather than comparing policies (Crew, 1992). This finding has two potential implications. Either the restrictions of the “Restrictive” policies do not go far enough to

impact the behavior of pursuit initiation, or the category of “Restrictive” and “Judgmental” within the definitions used are not distinct enough, impacting the sensitivity of comparison between these two policy groups.

Data from Minnesota State Patrol indicated that the proportion of pursuits that were ending in discontinuation or no initiation by law enforcement officers was increasing in State Patrol as a whole prior to the 2019 policy update. After the policy change, the rate of the proportion plateaued. This could be the result of a few possibilities. As the trend was present before the policy change, the proportion that could feasibly be discontinued or not initiated may have reached a point of saturation in which the rate reduced. A part of this possibility is that the culture of the agency was shifting before the formalization of the decision-making model introduced in May 2019. This cultural shift is not quantified in the current study but is a line of inquiry that is plausible and should be explored by further research. The data in this analysis were limited due to a change in the reporting process utilized by State Patrol. If data available went back further to at least the prior updates but ideally before the 2016 and 2017 policy changes, how culture or policy shifted over the full course of time would be clearer.

With this concept of a cultural change preceding formal policy, some limitations of this analysis are highlighted but act as points of interest that further studies can develop further. The local agencies and the sheriff departments were treated as having a consistent policy in the years before the most recent update. If there was a cultural shift occurring prior to the policy update, as hypothesized based on the State Patrol data, shifts in practices could have been occurring before the official change, biasing the results. Unlike the State Patrol data, the outcome of the pursuits in each local agency and sheriff's department was not available. So even though over time pursuits increased in the agencies analyzed (Table 5-2), the outcome of these pursuits was

opaque. On top of the opacity of the outcome, it is not clear how non-initiated pursuits are recorded by each agency, as UCR summary data is unclear if discontinuations include non-initiation with a fleeing vehicle. The difference between policies is an interesting finding that should be used as a basis for the rationale for further studies incorporating the outcome data.

The finds from this study show how policy restrictiveness does reduce the number of pursuits officers participate in, however, the reporting methods within the Uniform Crime Report do not distinguish between non-invitations and discontinued pursuits which can be achieved with the incident level data from State Patrol. However, this does not detract from the eternal give and take with the apprehension of fleeing individuals and the safety or risk to the public. Prior studies have suggested different methods of apprehension such as license plate tracking. Crime control needs to find a balance through restriction and alternative apprehension methods to provide safety to the public and proper law enforcement. Going back more than 20 years, Becknell suggested based on their similar findings that alternative approaches to apprehension “such as roadblocks, channelization, plate identification, and using portable barrier strips” should be utilized instead of pursuits (Becknell et al., 1999). More modern approaches can be a part of these alternatives. Systems like StarChase™, a compressed air fired GPS that can be mounted in police vehicles, allow for officers to track the fleeing individual and either set up in front of them with a road block or barrier strip, or locate the fleeing individual as the vehicle stops (Gaither et al., 2017). While still early in implementation and research, the utilization of technologies such as StarChase may result in offenders discontinuing their dangerous behavior earlier and allow officers to apprehend them in a safer manner for the public as mentioned by Dr. Geoffery Alpert in a report to NIJ on the use of StarChase in four testbed sites (Fischbach et al., 2015) As these new technologies become more available and affordable, their adoption may

lead to improved safety in the apprehension of fleeing individuals in a variety of situations and locations.

5.5.1 Conclusion

Findings from this study show how law enforcement policy on the pursuit of motor vehicles is perceived by the officers who are governed by it can impact the number of pursuits that occur within a year, but only when officers feel that pursuits are actively discouraged. The impact of perception is evident in the outcome of State Patrol pursuits, as discouragement and non-initiations were increasing prior to solidified policy change. Cultural perception shifts prior to before the official policy change could have led to this pattern. During conversations with law enforcement stakeholders this statement was corroborated by mentions of unofficial changes happening in departments without any written record. These changes may be something minor but could still impact the departmental perception of policy restrictiveness at a cultural level. In addition to policies actively discouraging pursuits outside of extreme circumstances, providing alternative methods of apprehension through technology and tactics. Where clearer policy could help improve pursuit outcomes, alternative methods of apprehension law enforcement can help improve pursuit outcomes by helping officers feel more comfortable with discontinuing or not initiating pursuits and still feel like they are doing their job. Further studies must also be conducted to better understand specifically what policy perceptions are driving changes, and how agency culture impacts results. Where this study provided input from a generally high ranking individual to represent the whole department within the local agencies and sheriff departments, future studies should aim to do a more in depth policy analysis and classification or gather a larger consensus on the perceived level of restriction of the department policy.

6 PREVALENCE OF CIRCUMSTANTIAL AND DEMOGRAPHIC VARIABLES IN A MOTOR VEHICLE CRASH AS A CHOSEN METHOD OF SUICIDE COMPARED TO OTHER METHODS

6.1 ABSTRACT

Objective: Variation in the populations utilizing different suicide methodologies is well documented. This study aims to explore a large data set of suicide reports to further understand the population that utilizes motor vehicle (MV) crashes as a method of suicidal violence, to compare and go beyond what current literature. Comparisons between MV crashes and other methods will include the prevalence of demographics and psychosocial circumstances.

Methods: Suicides captured within the National Violent Death Reporting System (NVDRS) from 2013-2020 were abstracted. Not all states were captured each year but by 2018 reporting to NVDRS was occurring in each state. A screening process was established to include incidents classified originally as “other” or “unspecified” methods. Added cases were reviewed by researchers to confirm the correct classification as a death due to a driver’s intentional action in the vehicle. Descriptive statistics and regression were utilized to describe associations of prevalence within the population demographics along with what psychosocial circumstances were present in victims’ lives prior to the crash. Psychosocial circumstances included histories of mental health disorders, suicidal ideation and attempts, disclosure of intent, substance use/addiction, intimate partner problems, criminal/legal problems, physical health, family problems, job/financial, school problems, and other circumstances.

Results: When the associations of circumstances were tested in a model histories of mental health disorders, substance abuse/addiction, criminal legal problems, physical health problems, job/financial problems, history of suicidal attempts, history of suicidal thoughts, and disclosure

of suicidal intent showed significance when adjusted for marital status, gender, and age.

Circumstances that had a higher prevalence of suicides by motor vehicle crash included criminal/legal problems, history of suicidal attempts, history of suicidal thoughts, and disclosure of suicidal intent. Motor vehicle suicides less commonly included the circumstances of physical health problems, family/friend death, and job/financial problems.

Conclusions: Suicides by motor vehicle crash are more prevalent within suicides that had criminal/legal problems, history of suicidal attempts, history of suicidal thoughts, and disclosure of suicidal intent. Future studies can continue building on this knowledge base and utilize these findings to improve surveillance and intervention methods to better reach this population.

6.2 INTRODUCTION:

6.2.1 Background

In the United States, suicide was the fifth-highest cause of death in 2020 for ages 10-64, and the second-leading cause of death for ages 10-34 (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, 2005). The World Health Organization (WHO) conducted a study in 2000 that found that between 1989 and 1993, 0.4% of suicides in men were via motor vehicle crashes and 0.1% in females (Michel et al., 2000). A review of motor vehicle crashes identified a 1 to 7 percent prevalence of suicide within motor vehicle fatalities (Routley et al., 2003). Within males, suicide is the tenth-leading cause of death across all age groups. Suicidal violence can be inflicted through a variety of methods. Overall, the most common method of suicide was firearms, accounting for 48.4% of all suicides followed by suffocation at 31.1%. Methods of suicide differ by demographics. Males use firearms and suffocation more often, while females use drugs/poison (Cai et al., 2021; Callanan & Davis, 2012). Methods also differ by marital status, unmarried individuals were less likely to utilize firearms (Callanan & Davis, 2012). The individual impact of MV crash suicides can extend damage to the driving population. A study in Finland addressed how this method of suicidal violence impacts the physical, psychological, and monetary well-being of large goods drivers who are struck by suicidal drivers (Radun et al., 2019). From 2011-2016, 138 cases in Finland had median monetary costs, when excluding claims that received no compensation, of 2,100€ (\$2775.11 in 2023) for personal injuries and 61,280€ (\$80,980.42 in 2023) in property damage. Beyond the monetary impact, a follow up study utilizing focus groups with the large goods drivers found reports of long term psychological impacts (Radun et al., 2021)

6.2.2 Objectives

Prior studies have identified some characteristics of the population who utilize motor vehicle crashes as a method of suicide, and some crash indicators that are common within the crashes.

In a large Finnish study analyzing data from 1974-1992, motor vehicle suicides most often involved males, 25 to 34 (Hernetkoski & Keskinen, 1998). Of note, firearms was the most common method of suicide within males 25 to 34 in the United States in 2020 (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, 2005). Finland has more restrictive gun laws so this study may have seen a shift in this population to motor vehicles as a method of suicide as a result (Alpers et al., 2022). Other studies showed similar findings with suicides using motor vehicles were primarily male (Gauthier et al., 2015; Milner & De Leo, 2012; Murray & de Leo, 2007; Routley et al., 2003). Prior history with depression and other mental health disorders were also identified as risks for intentional crashes resulting in death.

Additionally, this study will address the prevalence of different circumstances occurring in the lives of individuals prior to their death. The National Violent Death Reporting System (NVDRS) describes the circumstances leading up to a death that cover family, mental health, health, financial, and other life events that may impact the decision to commit suicide. Mental health circumstances include alcohol/substance abuse, depression, and other mental health histories that were addressed in prior studies. A prior study comparing motor vehicle suicides to other methods suggested that legal and financial issues were more common in motor vehicle suicides than other methods of suicide (Milner & De Leo, 2012).

One of the aims of this study is to not only update or corroborate these findings but also compare the populations who utilize motor vehicle crashes and those who use other methods.

Like with the demographic variables, this study will describe and compare the circumstantial variables within those who used motor vehicle crashes as a method of suicide and those who used other methods. For each demographic and circumstantial variable, this study aims to compare the prevalence of demographic and psychosocial circumstances within suicides by MV crashes with the prevalence of these variables within suicidal deaths by other methods (i.e., firearm, suffocation, exsanguination).

6.3 METHODS:

6.3.1 Study Design

This is a case series study of suicides within the United States from 2013-2020 captured using NVDRS data. NVDRS is a state-based surveillance system that pulls from a variety of sources, and “links information about the ‘who, when, where, and how’... and provides insights about ‘why’ the deaths occur.” (CDC, 2023). This study protocol was approved by the University of Minnesota Institutional Review Board (STUDY00016895).

Data were gathered by state and county agencies in the United States. Number of victims, victim information, and law enforcement/medical examiner narratives are gathered from death certificates, coroner/medical examiner records, law enforcement reports, and data abstractors input at a minimum (Centers for Disease Control and Prevention, 2015; Paulozzi et al., 2004). Additional sources such as crime lab and hospital data, along with Child Fatality team and Intimate Partner Violence expanded data can be utilized when necessary. NVDRS began data collection in 2002 in six states, with all states being included by 2018. However, NVDRS cannot be considered a nationally representative database. For the years of interest: AZ, CT, HI, IA, IL, IN, KS, ME, MN, NH, NY, PA, VT, and WA were added in 2014; AL, CA, DE, DC, LA, MO, NE, NV, Puerto Rico, WV were added in 2016; and AR, FL, ID, MS, MT, ND, SD, TN, TX, WY were added in

2018. Illinois, Pennsylvania, and Washington collected in a subset of counties in 2016 and 2017 representing 80% of violent deaths in those years. In 2018 and 2019, Washington transitioned to state-wide while Illinois and Pennsylvania remained only collecting a proportion. California also only recorded a small number of counties in 2017, 2018, 2019, and 2020. Texas only recorded data for four counties in 2020. Hawai'i was excluded for 2017, and 2018 due to incomplete reporting. New York was excluded in 2019 for the same reason.

6.3.2 Participants

Included incidents were deaths identified as suicides in the United States by local law enforcement, coroners, and medical examiners across the United States and its territories from 2013-2019. NVDRS collects suicide death data as suicide is a violent death. A death is violent if it is a result of "the use of physical force or power, threatened or actual against oneself, another person, or a group or community" (Centers for Disease Control and Prevention, 2015). NVDRS excludes legally assisted suicides, suicides from chronic substance abuse, acute substance use with "less than a preponderance of evidence" toward intent for self-directed violence, and autoerotic behavior resulting in death.

6.3.3 Case definition

Suicide methodology is reported on the death certificate of the individual. ICD-10 coding was utilized to identify the initial population of suicides, along with identifying those who used the crash of a motor vehicle as a method of suicide. "X82" is the ICD-10 code for the intentional crashing of a motor vehicle. The researcher performed narrative review to confirm that motor vehicle crashes were the cause of death in each incident. Narratives that were misclassified as "X82" included events such as pedestrian and train collisions, pedestrian and vehicle collisions, individuals jumping from bridges into traffic, and carbon monoxide poisoning. To be considered

a true case, the narrative must have indicated that the death is the result of the driver's action, such as impacting an object, driving into a body of water, leaping from the vehicle, or driving off a precipice. A narrative match guide was developed based on confirmed cases to identify further cases in the undetermined and other specified methods of suicide, reported as "X83" (Intentional self-harm by other specified means) and "X84" (Intentional self-harm by unspecified means) ICD-10 codes, or in incidents that had no listed ICD-10 code. The narrative search can be found in its entirety in Appendix 5: Narrative Search Terms. Search terms included language and terms for single-vehicle crashes, intentional multivehicle crashes, individuals driving off cliffs, and drownings. Search terms were used within a searching algorithm with pattern matching in R's *grep* function. The researcher reviewed new cases to confirm matching motor vehicle crash as the method for suicide. Cohen's kappa was used to measure the agreement between the narrative matching terms and confirmed cases by taking a random sample of 200 incidents excluding those with underlying codes of "X83", "X84" and missing underlying codes, along with those with no narrative. Of these 200 selected, the narrative matching correctly identified 188 of 200 (94% agreement), resulting in a Cohen's Kappa of 0.75, meaning the matching process had substantial agreement with prior NVDRS coding. The initial narrative review, development of narrative search, and identification of new cases were conducted primarily by one researcher with consultation on search term models by an advising researcher. Misclassification bias can occur at multiple stages in the data collection process. So, the reviewing of narrative and aims to reduce one area in which this can occur through incorrect ICD-10 codes being attributed during death certification.

6.3.4 Variables

The primary covariates of interest are the circumstance variables that NVDRS contains, which give a description of the individuals beyond basic demographics. For the purposes of this study, the initial circumstances reported by NVDRS were grouped into 12 categories. During the NVDRS abstraction process, law enforcement and coroner/medical examiner narratives are reviewed, as these reports are investigative in nature, inclusion and described as “closely preceding or occurring right after” the incident would grant the code for a particular circumstance (Centers for Disease Control and Prevention, 2022). Health and criminal legal problems are an exception, these require explicit indication of relation to the scenario, due to being a more routine aspect of death investigations. The specific NVDRS variables that were utilized in these groups are available in Appendix 6: NVDRS Circumstance Grouping. The final 12 variables were mental health, substance/addiction, history of suicidal attempts, history of suicidal thought, disclosure of suicidal attempt, intimate partner problems, criminal/legal problems, physical health issues, job/financial issues, death of family or friend, school problems, and other circumstances. Other circumstances included an anniversary of traumatic events and exposure to disasters. These circumstances help address varied factors within an individual’s life that influence stress and may influence the choice between motor vehicle crashes and other methods of suicides. A variable was created to reflect the total number of circumstance variables present for an individual incident. Other variables that were of interest to best describe the population that is utilizing motor vehicle crashes over other methodologies included: gender identified on the death certificate, race, marital status, education level, and age were all assessed for association with methodology choice.

6.3.5 Statistical *methods*

Descriptive associations were addressed through Pearson chi-square tests between counts of individuals who used a motor vehicle crash as a method of suicide compared to individuals who utilized any other method of suicide. These were performed on all circumstantial and demographic variables. A test of two means was used to test the difference between the total number of circumstances present in each group.

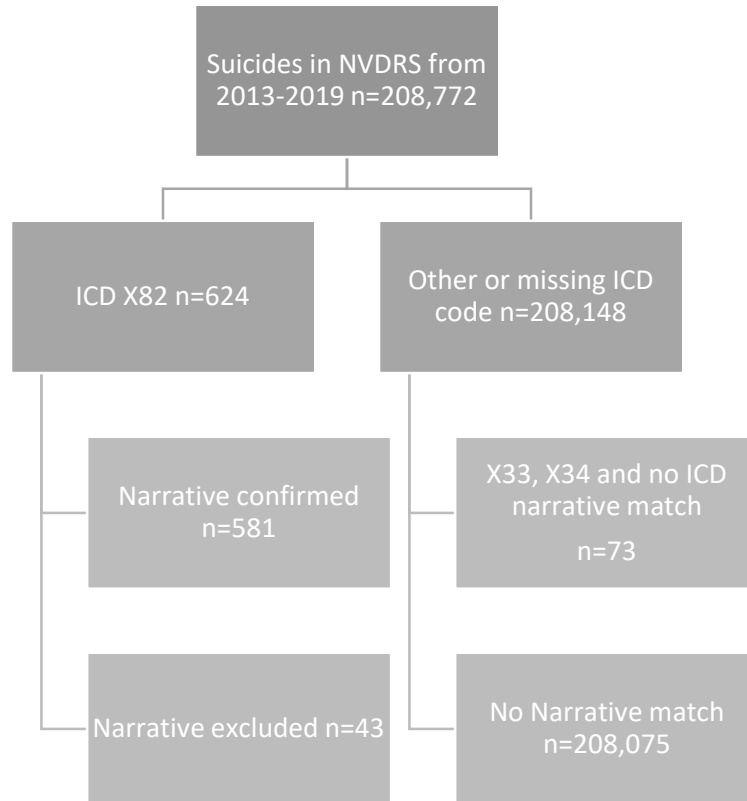
A robust Poisson regression was constructed to measure the risk ratio of utilizing motor vehicle crashes over other methodologies based on the presence or absence of the circumstance.

Covariates identified as impacting choice in methodology in previous literature (marital status, gender, and age) will be used as adjusting variables for the individual regression models. 95% confidence intervals will be reported along with prevalence ratios. These will be representative only as prevalence within the case population and not generalized to risk or prevalence in the general population.

6.4 RESULTS:

6.4.1 Participants

Figure 6-1 Selection of Participants



Of the initial 208,772 incidents reported, 624 were reported as intentional motor vehicle crashes with ICD-10 code “X82”. Of these 581 had their narratives confirmed as motor vehicle crashes or actions of a driver that resulted in the driver’s death, 43 were not. Of the remaining 208,148 cases with other ICD codes or missing ICD codes, an additional 73 crashes were identified from our narrative review of codes for unspecified (X83) or other (x84) means or was missing an ICD 10 code. This resulted in 654 suicides by motor vehicle crash, and 209,118 deaths through other methods, resulting in a prevalence of 0.3% (654 MV crashes/208,772 total suicides).

6.4.2 Descriptive Data

Across characteristics, chi-square tests showed differences in marital status, education level, and age comparing those who utilized a motor vehicle crash as a method of suicide versus those who did not (Table 6-1). A larger proportion of individuals in motor vehicle crashes identified as single (never married) compared to the rest of the suicide methods (48.2% of motor vehicle crashes compared to 37.5% in the rest of the suicide methods). Education at the High School/GED (43.1% vs 41.5%) and “Some College” (20.5% vs 17.1%) categories were both higher in the motor vehicle crashes versus other suicide methods. Those who utilized a motor vehicle crash as a method of suicide were younger than those who used other methods. Circumstances surrounding suicides were commonly known across groups (87.5% and 89.1%). Alcohol use was suspected in 14.5% of MV crashes and 18.8% of other methods.

Table 6-1 Demographics by method of suicides within NVDRS data 2013-2020

Variable	Motor Vehicle Crash N = 654 ¹	Other Methods of Suicide N = 208,118 ¹	p-value ²
Gender			0.3
Female	155 (23.7%)	45,353 (21.8%)	
Male	499 (76.3%)	162,760 (78.2%)	
Unknown	0	5	
Race			0.083
White	553 (84.6%)	181,277 (87.3%)	
Black or African American	50 (7.6%)	13,702 (6.6%)	
Asian/Pacific Islander	17 (2.6%)	5,568 (2.7%)	
American Indian/Alaska Native	16 (2.4%)	2,815 (1.4%)	
Two or more races	11 (1.7%)	2,210 (1.1%)	
Other/Unspecified	7 (1.1%)	2,094 (1.0%)	
Unknown	0	452	
Marital Status			<0.001
Single	308 (48.2%)	76,076 (37.5%)	
Divorced/Separated	136 (21.3%)	49,934 (24.6%)	
Partnered	176 (27.5%)	64,829 (32.0%)	

Widowed	19 (3.0%)	12,013 (5.9%)
Unknown	15	5,266
Education Level		0.031
Associate degree or higher	142 (22.8%)	51,352 (26.3%)
Some college	128 (20.5%)	33,339 (17.1%)
High School/GED	270 (43.3%)	81,072 (41.5%)
Less than High School/GED	84 (13.5%)	29,503 (15.1%)
Unknown	30	12,852
Age		<0.001
Under 20	74 (11.3%)	10,140 (4.9%)
20-29	150 (22.9%)	34,944 (16.8%)
30-39	126 (19.3%)	34,581 (16.6%)
40-49	107 (16.4%)	34,869 (16.8%)
50-59	114 (17.4%)	39,932 (19.2%)
60+	83 (12.7%)	53,652 (25.8%)
Circumstances Known		0.2
No	82 (12.5%)	22,700 (10.9%)
Yes	572 (87.5%)	185,418 (89.1%)
Alcohol Use Suspected		0.043
No	442 (69.6%)	134,417 (65.9%)
Not applicable	0 (0.0%)	110 (0.1%)
Unknown	101 (15.9%)	31,114 (15.3%)
Yes	92 (14.5%)	38,365 (18.8%)
Unknown	19	4,112

¹ n (%)

² Pearson's Chi-squared test

6.4.3 Circumstance data

Circumstances surrounding suicides differed by method. Criminal/legal problems were more prevalent in suicides by MV than other methods (12.8% vs 9.7%). Physical health (9.7% vs 19.2%), family/friend death (5.0% vs 7.5%), and job/financial problems (10.7% vs 15.3%) were less prevalent in motor vehicle crashes than other methods. History of suicidal attempts (22.9%

vs 17.7%), history of suicidal thoughts (37.5% vs 30.4%), and disclosure of suicidal intent (35.0% and 21.3%) were more common in motor vehicle crashes than other methods. The median total number of circumstances also did not differ by methodology (Table 6-2).

Table 6-2 Psychosocial circumstances of suicides by methods, NCDRS 2013-2020

Variable	Motor Vehicle Crash N = 654¹	Other Methods of Suicide N = 208,118¹	p-value²
History of Mental Health Problem			0.1
Yes	307 (46.9%)	104,498 (50.2%)	
No/Unknown	347 (53.1%)	103,620 (49.8%)	
History of Suicidal Attempt			<0.001
Yes	150 (22.9%)	36,734 (17.7%)	
No/Unknown	504 (77.1%)	171,384 (82.3%)	
History of Suicidal Thought			<0.001
Yes	245 (37.5%)	63,179 (30.4%)	
No/Unknown	409 (62.5%)	144,939 (69.6%)	
Disclosure of Suicidal Intent			<0.001
Yes	229 (35.0%)	44,273 (21.3%)	
No/Unknown	425 (65.0%)	163,845 (78.7%)	
Substance/Addiction			0.3
Yes	164 (25.1%)	56,194 (27.0%)	
No/Unknown	490 (74.9%)	151,924 (73.0%)	
Intimate Partner Problem			0.8
Yes	163 (24.9%)	50,885 (24.5%)	
No/Unknown	491 (75.1%)	157,233 (75.5%)	
Criminal/Legal Problems			0.009
Yes	84 (12.8%)	20,244 (9.7%)	
No/Unknown	570 (87.2%)	187,874 (90.3%)	
Physical Health Problem			<0.001
Yes	63 (9.6%)	39,955 (19.2%)	
No/Unknown	591 (90.4%)	168,163 (80.8%)	
Family/Friend Death			0.023
Yes	33 (5.0%)	15,539 (7.5%)	
No/Unknown	621 (95.0%)	192,579 (92.5%)	

Job/Financial				0.001
	Yes	70 (10.7%)	31,933 (15.3%)	
	No/Unknown	584 (89.3%)	176,185 (84.7%)	
School Problems				0.09
	Yes	11 (1.7%)	2,103 (1.0%)	
	No/Unknown	643 (98.3%)	206,015 (99.0%)	
Other Circumstances				>0.9
	Yes	10 (1.5%)	3,063 (1.5%)	
	No/Unknown	644 (98.5%)	205,055 (98.5%)	
Total Circumstances		1.99 (1.60)	2.05 (1.53)	0.4

¹ n (%); Mean (SD)

² Pearson's Chi-squared test; Welch Two Sample t-test

Regression Models

For each circumstance, an adjusted robust Poisson regression further described the association in these circumstances. History of suicide attempt/thought, and disclosure of intent had 1.28 to 1.96 times the prevalence of suicide by MV than other causes. However, a history of mental health problems, had a 16% reduced prevalence of motor vehicle crashes as compared to other methods in the adjusted model. Criminal/legal problems-were associated with 1.27 times increased prevalence of utilizing a motor vehicle crash over other methods. Substance abuse/addiction [0.84], physical health problems [0.63], a family/friend death [0.71], and job/financial problems [0.69] had a reduced prevalence of utilizing a motor vehicle crash over other methods (Table 6-3).

Table 6-3 Prevalence ratios of motor vehicle crash suicides by psychosocial circumstance

Variable	Estimate	Lower CI	Upper CI
Mental Health	0.86	0.74	1.00
History of Suicidal Attempt	1.28	1.06	1.56
History of Suicidal Thought	1.32	1.12	1.55
Disclosure of Suicidal Intent	1.96	1.67	2.30
Substance/Addiction	0.84	0.70	1.00

Intimate Partner Problem	0.91	0.76	1.10
Criminal/Legal Problems	1.27	1.01	1.61
Physical Health	0.63	0.48	0.83
Family/Friend Death	0.71	0.49	1.01
Job/Financial	0.69	0.47	0.88
School Problems	0.86	0.50	1.59
Other Circumstances	1.12	0.60	2.09

**Adjusted by marital status, gender, and age*

6.5 DISCUSSION:

6.5.1 Key results

This study is among the first to identify differences in the prevalence of psychosocial circumstances between suicides utilizing motor vehicle crashes compared to the use of any other method of suicide. Individuals who died by intentional MV were also more commonly disclosing their intent, along with having a history of suicidal thoughts, and criminal/legal problems compared with suicides from other methods. Those with substance use/alcohol abuse, physical health problems, family/friend death, and job/financial problems all chose other methods of suicide over motor vehicles. Our research also found that individuals who chose a motor vehicle as a method of suicide over all other methodologies were younger and single.

An initial area of interest for this study was the assessment of the industries and occupations of suicides by MV versus other methods. However, usual occupations and industries were often reported as other or missing with sole descriptors such as “agriculture.” While the investigation into these broad categories could be of interest it was not consistent or descriptive enough. For instance, there were times when “agriculture” was combined with such terms as “educator”. Combining of these terms were not consistent or categorizable enough to be utilized within this study. Overall, NVDRS provides a wide breadth of data that is incredibly useful to the analysis of

suicide data, however, due to the complexities of suicide fatalities, current reporting practices do not provide the depth required for some analyses.

6.5.2 Interpretation

Motor vehicle crashes as a method of suicide is reported as a rare occurrence representing less than one percent of suicides in the NVDRS from 2013 to 2019. While there is the possibility of under-reporting, this study aimed to delve into the population and identify commonalities and differences between those that decided to commit suicide through the actions of driving a motor vehicle, whether it be as a collision into another object, driving into a body of water, driving off a precipice, or leaping from the vehicle as a driver and those who chose a different method. As these results aimed to describe an understudied population in a case only analysis, the interpretation of these results is not to be construed as causal, but as a foundation of understanding for future studies, surveillance, and intervention.

The prevalence of suicides by motor vehicle crashes in this study (0.3%) was in line with the Michel and colleagues' study which found an overall prevalence of 0.2% (Michel et al., 2000). Suicides by MV were also younger and single. Two prior studies, in contrast, found that while younger populations were a higher proportion in motor vehicle crash suicides, the relationship status or single was not different in one study (Milner & De Leo, 2012) and married with children being the most common household status in another (Murray & de Leo, 2007). However, both studies were based in Australia so the difference may be due to cultural differences between populations. Physical health problems, job/financial problems, and the death of family or friends are all circumstances that, while they can occur earlier in life, become more likely as individuals age. However, even when adjusted for age, these metrics still were less prevalent in motor vehicle crash suicides, so there may be additional factors to these circumstances that drive this

association which should be covered by future studies. The one non-mental health circumstance that had increased prevalence in motor vehicle crashes was criminal and legal problems. Future studies could utilize narrative analysis to compare how more specific criminal and legal issues may vary across methods. A higher prevalence of past suicidal attempts and thoughts, along with a higher prevalence of disclosure of intent within motor vehicle crashes, shows how planning may be a more common predecessor to the actions taken. However, as discussed further in the limitations, this could also be a result of misclassification bias due to the difficulty in the identification of MV crashes as suicides during the investigation into these deaths. This finding of higher prevalence in disclosure contradicts a previous study that looked at suicide notes. A study by Gauthier et al. found less evidence of notes which indicated a potential for suicide through motor vehicle crashes to have an increased level of impulsivity (Gauthier et al., 2015).

Another related variable to impulsivity is substance and alcohol abuse. In previous studies, alcohol use was present in examined incidents (Connolly et al., 1995; Routley et al., 2003). In relation to alcohol use within the method of interest, the findings within our study showed that substance abuse and alcoholism were less prevalent than in other methodologies, and alcohol use was suspected in 14% of the cases of motor vehicle crashes and 18% of other methodologies. A review by Imants et al. highlighted the conflict across current literature about the role of alcohol use in suicidal motor vehicle crashes (Imants et al., 2022). Prior study findings reported alcohol associations ranging from no presence of alcohol to an increase of alcohol prior to the suicide attempt (Gauthier et al., 2015; Milner & De Leo, 2012)

As this study and further studies further build knowledge about these suicides, understanding the population further can help identify individuals who may be at risk of using a motor vehicle

crash as a method of suicide. Prior studies of this type have been done, but not within the United States on a national level. These types of studies can help clinicians but also individuals with close relationships with potential victims in being aware of potential suicide attempts in at-risk time periods. Further knowledge can also help law enforcement and medical examiners identify populations that should be of heightened suspicion of suicide in motor vehicle crashes. This further knowledge must be developed by future studies that go beyond case only data to fully establish population level statistics. Further identification of suicides can further data and understanding of this population can further prevention efforts down the road.

6.5.3 Limitations

While NVDRS data provides extensive surveillance efforts, inconsistent reporting practices can result in misclassification of suicide methods. For example, non-motor vehicle crashes could be incorrectly identified as crashes. However, more likely to occur are misclassification of intentional MV as unintentional. We attempted to correct some misclassification through a narrative review of a sample of cases, but the sheer number of incidents and variety in narrative means that some misclassifications still potentially remained. Other ICD 10 codes were not analyzed with the narrative match and confirmation process as a limitation of researcher bandwidth. Another area of limitation within surveillance reporting is missingness or inconsistency with reporting.

Within the nature of the outcome itself, there is most assuredly underreporting of motor vehicle crashes as a method of suicide. As motor vehicle crashes, even single-vehicle crashes, happen on a regular basis, the identification of a resulting death can be incredibly difficult. Unless there are clear crash indicators (no seatbelt, skid marks, etc.) and/or mental health evidence (disclosure of intent, history of suicidality, etc.) the identification of death as a motor vehicle suicide can be

incredibly difficult. This could affect the prevalence identified in this study, as the death investigation process may be more likely to misclassify motor vehicle crashes as non-suicide. We cannot make that assumption based on current data but studies in the past have suggested this finding (Milner & De Leo, 2012; Routley et al., 2003). The prevalence of disclosure of intent seen in this study did show though that even if there is misclassification in this area, the current prevalence from this data is still less than most cases. Milner and De Leo also suggested that differences in their findings between “possible” and confirmed cases of suicide using motor vehicle crash was due to the difficulty of identifying a crash as a suicide without a note. Driving conditions and other stress indicators being some of the indicators of possible suicidal intent in this case.

6.5.4 Conclusion

Findings from this study indicate there are populations and psychosocial circumstances that differ in proportion between motor vehicle crashes as a method of suicide as compared to other methods of suicides. Some of the circumstances that showed an association with the study are potentially spurious and an artifact of the difficulty of identifying a motor vehicle crash as a suicide. However, associations within circumstances such as criminal/legal problems, physical health issues, family or friend deaths, and job/financial problems are potentially less impacted by the misclassification from identification difficulties. Findings related to circumstances can be used in concert with previous demographic findings to further understand the behavior and decisions made by individuals choosing motor vehicle crashes as a method of suicide. As this is a rare method of suicidal violence that can be sometimes difficult to identify from other crashes, better understanding the suicides that utilized this method can build into future research and interventions further tailored to better reach this community. Building further on the study will

also help clarify how the difference in circumstance risk differs within other means of violent death and circumstance prevalence within the general population.

7 DISCUSSION

7.1 SUMMARY OF FINDINGS

Phenomenology, specifically hermeneutic phenomenology, is a philosophical tradition that attempts to provide some semblance understanding of how an individual interacts with and interprets events within their lives (Heidegger, 1962). Concepts within phenomenology like the *lifeworld* were previously not commonly used within the field of injury prevention pertaining to traffic safety and law enforcement but had been within the nursing field (Ajjawi & Higgs, 2007). However, with the variety of factors from an individual's experience and background that can affect the decision making and cognition process, especially in dangerous situations such as a pursuit or a suicide attempt, exploring more areas within injury and public health in general would benefit from at least thinking through phenomenological philosophy when considering research questions. The Aims of this dissertation strive to show how this ideology can be incorporated into different methodologies and goals within a public health setting.

7.1.1 Aims 1

Methods within this aim bring phenomenological thinking on a literal level by utilizing interpretive phenomenological analysis of semi-structured interviews with police officers, public defenders, and individuals who had fled from police. This traditional use of phenomenology as interpretive phenomenological analysis derived spheres of influence that impact the decision making of individuals who make the decision to flee from law enforcement and the law enforcement that pursue them. Across interviews with these sub-groups personal and systemic experiences in the past combine with current circumstances that affect the desired outcome and its likelihood.

Officers being influenced by policy, experience, and the interaction of experience and policy, mirrors how individuals who fled are influenced by their legal and non-legal circumstances that individuals are currently experiencing and have experienced in the past. This interpretation of findings is grounded in understanding that conflict between law enforcement and the public gives drive to either party in coming into an interaction with a preconceived notion to pursuit or flee from the encounter. Both combinations of spheres of influence are ready for conflict prior to the interaction. With fleeing individuals wanting to avoid the conflict and consequences of being stopped, and officers approaching a situation deemed to be potentially a conflict prone situation.

7.1.2 Aim 2

Findings from Aim 1, along with background literature showed that one of the major influences in officer decision making was the policy that the department had for engaging in pursuits. What is written specifically, however, does not inherently dictate how policy translates into the real world, as law enforcement officers need to enact policy. Based on the ambiguity of the within the MN POST board model policy (Appendix 1: Minnesota Peace Officer Standards and Training Vehicle Pursuits Model Policy), there was a sizeable amount of interpretation up to the officer in some cases. Aim 2 used survey methodology within local agencies and sheriff departments, along with outcome data from the Uniform Crime Report to understand if the pursuit policy restriction truly impacts the total number of pursuits. This Aim also used incident level data from State Patrol to understand how outcomes of pursuits differ when a more restrictive policy is put into place. Based on the perceived restrictiveness of current and past policy, local law enforcement agencies and sheriff departments did not show a reduction in reported pursuits in “Restrictive” policies as compared to “Judgmental” policies, but “Discouragement” policies did

show a decrease in reported pursuits compared to "Judgmental" policies. State Patrol data showed that the decision-making model did not impact the outcome of pursuits, however the number of discontinuations and non-initiations was already increasing prior to the policy update. This trend could be due to cultural changes and other policy changes; however, data was not available to test these scenarios.

When thinking of this from a phenomenological perspective, a concept hypothesized to impact the *lifeworld* of officers based on literature and qualitative findings was tested to see if this hypothesized concept did influence decision making enough to change behavior. By measuring the perceived policy, while not categorizing the true restrictiveness, officers categorize more closely what would impact decision making, which is the understood restrictiveness, at least according to the primary contact. The results of this Aim show that perceived policy does impact total pursuits, but only when the most restrictive policy was in place. Additionally, policy is only one part of decision making as shown in the State Patrol data. Improved outcomes were occurring prior to a more restrictive policy being formalized.

7.1.3 Aim 3

As the target population of study shifted from pursuit involved individuals to individuals who utilize a motor vehicle crash as a method of suicide, surveillance data was analyzed with descriptive methods to conceptualize how circumstances and demographic factors may factor into the risk of motor vehicle crash as a suicide method compared to another. When comparing prevalence of certain demographics and circumstances, there were some that showed to differ in prevalence within the different populations of suicides, in this case those utilizing motor vehicle crashes as compared to all other methods. Individuals who identified as single and

individuals who reported ages under 30 were more prevalent in motor vehicle suicides. When looking at the psychosocial stressors, a history of suicidal attempts or thought, and a disclosure of suicidal intent were more prevalent in motor vehicle crashes after adjusting. However, due to the nature of identifying suicidal crashes, and its difficulty, these prevalence ratios should be interpreted with caution. Criminal/legal problems were more common in point estimate (1.27). Substance/alcohol abuse. physical health and job/financial problems, along with deaths of family/friends were circumstances that were less prevalent within motor vehicle crash suicides as compared to other methods.

While not directly a phenomenological analysis like Aim 1, like Aim 2 this analysis and findings are rooted in understanding, to some extent, the *lifeworld* of the individuals within the outcome target population. Understanding differences in circumstances/psychosocial stressors of individuals in combination with other life characteristics (in this case described by demographic data) can help further understand how different events and stresses are interpreted and interacted with to result in an individual choosing suicidal violence via motor vehicle crash.

7.2 GUIDANCE FOR FUTURE EXPLORATION

The aims of this dissertation are to create foundations for early beginnings phenomenology within traffic safety and law enforcement in the context of which this philosophy was applied. Each Aim provided context for the factors that influence the decisions made leading to the examined phenomenon, however this context should be fine-tuned and expanded upon through future studies.

Within the interviews with pursuit involved individuals, understanding how past experiences and current circumstances of individuals who flee the police and police impact the occurrence

and outcomes of pursuits further can help reduce the occurrence of pursuits and improve the safety of them when they do happen. Findings from this Aim can already begin to provide some common ground from which to build potential interventions. As one public defender suggested for juvenile defenders, bringing the community and law enforcement together to provide better understanding for both sides could provide a safer environment for the involved parties and the public.

Some of the findings from Aim 1 are continued to be explored through Aim 2 by addressing preliminary the direct effects of how perceived policy restrictions on pursuit occurrence.

However, these preliminary findings can be expanded to gather a larger sample of law enforcement officers to gain greater power in understanding how perception impacts involved pursuits. Likewise further policy analysis and more granular look at pursuit outcomes regarding policy changes can be built upon the findings of the State Patrol analysis. Each of these analyses would further the understanding of how policy interacts with individual interpretations along with how departmental culture shifts before and after the formal policy changes go into effect.

Circumstances and demographics that were more prevalent within suicides act as a baseline for future exploration. Each step of understanding how these factors characterize the population that utilize motor vehicles crash as a method of suicide adds another level of understanding that can help progress future research and intervention. First is the identification of suicides using motor vehicle crashes. Within current practices, the identification of suicides via motor vehicle crash can be difficult unless there are clear factors, and if not the likelihood of an alternative or unknown cause being assigned causes misclassification difficulties. By working backward with case prevalence, this group that should be paid close attention to in crash investigation should be iteratively researched with varied and large groups. These complete factors can provide

better identification, and ultimately result in better interventions. If the *lifeworld* factors identified across this and other studies are held confidently, future education and prevention measures can be more targeted by interventions which in turn can be modeled around a phenomenological approach.

8 CONCLUSION

Phenomenology is by no means a new way of thinking within qualitative research, but application within the field of injury prevention outside of nursing has been underutilized. As topics like social determinants of health continue to be explored, the use of phenomenology as a philosophical basis in how studies are designed, and research questions are formulated. This holistic approach can also help find connections within seemingly disparate topics such as motor vehicle pursuits and suicides using motor vehicle crashes. By looking into the influences and life factors of those who flee, pursue, or crash a vehicle, overlaps can be found within the findings of this study, such as the presence of underlying stress and background influences on seemingly impulsive acts. Even beyond the findings of this study, aggressive car culture within the United States could contribute to the choice to flee, pursue, or crash a vehicle as a method of suicide. While this is discussed within the qualitative findings of this research, further research is needed to characterize the influence aggressive or impulsive car culture has on pursuits and motor vehicle crash suicides. Additionally, phenomenological constructs and thinking can provide contextualized understanding to qualitative and quantitative research, whether its utilizing phenomenological analysis within qualitative research as demonstrated in Aim 1, or by thinking through how aspects of the *lifeworld* contribute to causal and descriptive quantitative modeling as shown within Aims 2 and 3. Future studies within law enforcement and traffic safety injury

can and should aim to use the philosophical framework of phenomenology in larger and more robust studies to formulate better working models of decision making within potentially injurious motor vehicle incidents to provide the ability to create more informed interventions.

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10 APPENDICES

APPENDIX 1: MINNESOTA PEACE OFFICER STANDARDS AND TRAINING VEHICLE PURSUITS MODEL POLICY

MN RULES 6700.2701

I. POLICY

It is the policy of the _____ (law enforcement agency) to protect lives while enforcing the law and to guide its officers in the safe and reasonable performance of their duties. To accomplish these goals, the following policy is provided to control and regulate emergency vehicle operations. When engaged in emergency vehicle operations in the performance of official duties, drivers of authorized emergency vehicles are granted exemptions from certain traffic laws by State Statute. These exemptions are provided to help protect lives, not to place them at undue risk.

II. DEFINITIONS

- A. *Pursuit*:** A multi-stage process by which a peace officer initiates a vehicular stop and a driver resists the signal or order to stop, increases speed, takes evasive action and/or refuses to stop the vehicle. Once the driver refuses to obey the peace officer's signal or order, this pursuit policy and procedure will determine the officer's and agency's actions.
- B. *Termination of a Pursuit*:** A pursuit shall terminate when the pursuing officer(s) turn off the emergency equipment, resume routine vehicle operation and informs dispatch, or when the suspect vehicle stops.
- C. *Divided Highway*:** Any highway that is separated into two or more roadways by:
 - 1. a physical barrier, or
 - 2. a clearly indicated dividing section constructed so as to impede vehicular traffic.
- D. *Channeling*:** To direct vehicular traffic into a progressively narrowing passageway or lane location on the roadway.

- E. *Compelling Path:*** The use of channeling technique with a modified roadblock located at its narrowed end. The compelling path differs from a termination roadblock in that the driver or any vehicle traveling the path has an exit option at the narrowed end.

III. PROCEDURE

10.1.1.1 A. *Pursuit Considerations*

1. Pursuit is justified when:
 - a) a vehicle operator fails to stop after being given a visual or audible signal to stop by a peace officer; and
 - b) there is reasonable expectation of a successful apprehension of the suspect.

2. Other factors to be considered:
 - the initial decision to engage in a pursuit shall rest primarily with the officer who has initiated the vehicular stop, after considering the elements of this policy.
 - these elements shall include, but are not limited to: the crime for which the suspect is wanted (the need to apprehend immediately), and the risk to the community created by the pursuit (traffic, area of pursuit, environmental factors, and weather conditions).
 - the officer must continually consider the risks created by the pursuit, as those risks may change during a pursuit.
 - terminating a pursuit shall be considered a decision made in the interest of public safety.
 - the officer's decision to continue a pursuit may be overridden by a supervisor at any time.

3. Standards applied to the evaluation of a pursuit, as well as the decision to continue a pursuit shall include the following considerations:
 - is the need to immediately apprehend the suspect more important than the risk created by the pursuit.
 - do the dangers created by the pursuit exceed the danger posed by allowing the perpetrator to escape.

B. *Procedures & Tactics for an Officer Engaging in a Pursuit*

1. Emergency vehicles shall be driven in a safe manner and with due regard for public safety.

2. Emergency vehicles operating in emergency mode are permitted to violate certain traffic regulations when necessary, as long as the operator continues to exercise due care in vehicle operation.
3. The pursuing vehicle shall be known as the primary unit, which will be the unit closest to the fleeing vehicle and the secondary unit, which shall remain at a safe distance behind the primary unit but close enough to provide support and communicate with dispatch. Backup units as needed shall operate at a safe distance to provide support.

C. Responsibilities of the Primary Unit

1. The driver of the primary unit shall notify dispatch of the pursuit and shall provide at least the following critical information to dispatch:
 - unit identification.
 - offense for which the suspect is being pursued.
 - suspect vehicle description including license number if reasonably possible.
 - location, direction, and speed of both vehicles.
 - description of occupant(s) and if suspect is known to the officer.
 - any other important information about the suspect vehicle or environment (for example, the suspect is traveling without lights, or the officer has lost sight of the vehicle).
2. Based on the known information the supervisor shall make the decision to either take further appropriate action or terminate the pursuit.
3. No officer will intentionally make vehicle-to-vehicle contact unless this action is in conformance with agency policy on use of force (see agency policy on use of force).
4. Roadblocks must conform to the agency's policy on use of force.
5. Only law enforcement vehicles with emergency lights and siren will be used as pursuit vehicles.

D. Supervision of Pursuit Activities

1. Each agency shall outline their procedures regarding who has control over pursuit activities.

2. Procedures regarding control over pursuit activities should:
 - reference who should be notified a unit has become involved in a pursuit.
 - reference who critical information necessary to evaluate the continuation of the pursuit should be directed to.
 - indicate who has the authority to terminate any pursuit.
3. Options to keep in mind during a pursuit include, but are not limited to:
 - parallel pursuits.
 - channeling techniques.
 - creating a compelling path.
4. Post-pursuit chain of command notifications are required and should be identified in each agency's policy.

E. Dispatch Responsibilities

Dispatch shall coordinate critical information as timely and accurately as is reasonably possible.

F. Factors Influencing the Termination of a Pursuit:

The driver of the primary unit and the supervisor shall continually evaluate the risks and likelihood of a successful apprehension of the suspect, and shall consider terminating the pursuit under the following conditions.

1. The conditions of the pursuit become too risky for the safe continuation of the pursuit.
2. A supervisor orders it terminated.
3. Information is communicated that indicates the pursuit is out of compliance with policy.
4. Communication is broken.
5. Visual contact is lost for a reasonable period of time or the direction of travel cannot be determined.

6. The suspect is known and could be apprehended later, and delaying apprehension does not create a substantial known risk of injury or death to another.

G. Interjurisdictional Pursuit

1. The primary unit shall update critical information to the dispatcher before leaving its jurisdiction.
2. The primary law enforcement vehicle shall remain the primary vehicle in other jurisdictions unless the controlling pursuit authority transfers its authority to another jurisdiction.
3. Upon receiving notification the pursuit is entering another agency's jurisdiction, the dispatcher shall forward all critical information possessed by the dispatcher to that agency.
4. When a pursuit enters this law enforcement agency's jurisdiction:
 - the dispatcher shall update the critical information to the shift supervisor or other authorized individual identified by the law enforcement agency.
 - the controlling pursuit authority shall determine if the pursuit is in conformance with policy and shall provide appropriate direction to their units.

H. Air Support

Once contact is made with air support and air support has the suspect vehicle in sight, the primary pursuit unit shall reduce the level of pursuit to that of support or backup unit.

10.1.1.1.1 I. Care and Consideration of Victims

1. If during a pursuit an officer observes or is made aware of an injury to an individual, the officer shall immediately notify the dispatcher to have the appropriate emergency units respond.
2. The primary pursuit unit will be responsible for ensuring assistance is provided to people who may have been injured during the course of a pursuit. The primary pursuit unit may delegate the responsibility to render the assistance to a backup unit.

J. Pursuit Summary Report

1. The primary officer and the supervisor shall file a pursuit summary report.
2. To ensure compliance with MN STAT 626.5532, the chief law enforcement officer shall ensure the completion of the State pursuit report form and forward it to the Commissioner of Public Safety within 30 days following the incident.
3. As required in MN STAT 626.5532, the report must contain the following elements:
 - a) the reason(s) for, and the circumstances surrounding the incident;
 - b) the alleged offense;
 - c) the length of the pursuit including time and distance;
 - d) the outcome of the pursuit;
 - e) any injuries or property damage resulting from the incident; and
 - f) any pending criminal charges against the driver.

K. Evaluation and Critique

After each pursuit the supervisor and law enforcement agency units involved with the pursuit will evaluate the pursuit and make recommendations to the chief law enforcement officer on ways to improve the agency's pursuit policy and tactics.

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APPENDIX 2: COREQ CHECKLIST

Domain 1: Research team and reflexivity

Personal Characteristics

1. Interviewer/facilitator: Which author/s conducted the interview or focus group?
2. Credentials: What were the researcher's credentials? E.g., PhD, MD
3. Occupation: What was their occupation at the time of the study?
4. Gender: Was the researcher male or female?
5. Experience and training: What experience or training did the researcher have?

Relationship with participants

6. Relationship established: Was a relationship established prior to study commencement?
7. Participant knowledge of the interviewer: What did the participants know about the researcher? e.g., personal goals, reasons for doing the research.
8. Interviewer characteristics: What characteristics were reported about the interviewer/facilitator? e.g., Bias, assumptions, reasons, and interests in the research topic.

Domain 2: Study design

Theoretical framework

9. Methodological orientation and Theory: What methodological orientation was stated to underpin the study? e.g., grounded theory, discourse analysis, ethnography, phenomenology, content analysis.

Participant selection

10. Sampling: How were participants selected? e.g., purposive, convenience, consecutive, snowball
11. Method of approach: How were participants approached? e.g., face-to-face, telephone, mail, email.
12. Sample size: How many participants were in the study?
13. Non-participation: How many people refused to participate or dropped out? Reasons?

Setting

14. Setting of data collection: Where was the data collected? e.g., home, clinic, workplace.
15. Presence of non-participants: Was anyone else present besides the participants and researchers?
16. Description of sample: What are the important characteristics of the sample? e.g., demographic data, date.

Data collection

17. Interview guide: Were questions, prompts, guides provided by the authors? Was it pilot tested?
18. Repeat interviews: Were repeat interviews carried out? If yes, how many?

19. Audio/visual recording: Did the research use audio or visual recording to collect the data?
20. Field notes: Were field notes made during and/or after the interview or focus group?
21. Duration: What was the duration of the interviews or focus group?
22. Data saturation: Was data saturation discussed?
23. Transcripts returned: Were transcripts returned to participants for comment and/or correction?

Domain 3: analysis and findings

Data analysis

24. Number of data coders: How many data coders coded the data?
25. Description of the coding tree: Did authors provide a description of the coding tree?
26. Derivation of themes: Were themes identified in advance or derived from the data?
27. Software: What software, if applicable, was used to manage the data?
28. Participant checking: Did participants provide feedback on the findings?

Reporting

29. Quotations presented: Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g., participant number?
30. Data and findings consistent: Were there consistency between the data presented and the findings?
31. Clarity of major themes: Were major themes clearly presented in the findings?
32. Clarity of minor themes: Is there a description of diverse cases or discussion of minor themes?

APPENDIX 3: SCREENING SURVEY

Pursuit Interview Screening Survey:

Q1: What is your gender?

- Man
- Woman
- Transgender Woman
- Transgender Man
- Gender variant/non-conforming

Prefer to self-describe _____

Q2: What categories best describe you? Choose all that apply.

- American Indian or Alaska Native
- Asian
- Black or African-American
- Hispanic, Latinx, or Spanish Origin
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- White
- Some other race, ethnicity or origin

Other: _____

Q3: What is your age?

_____ years old

Q4: Have you ever been pursued by police while driving a motor vehicle?

Yes No

Q5: If you have been pursued, were you caught by the police pursuing you?

Yes No

Q6: If you were caught, were you arrested?

Yes No

Q7: What were you charged with as a result of being caught by police? Check all that apply:

- Fleeing Police
- DWI
- Motor Vehicle Theft
- Speeding
- Driving without a license

Other _____

Q8. Are you currently being detained for an event that involved you fleeing from the police in a motor vehicle?

Yes

No

APPENDIX 4: INTERVIEW QUESTIONNAIRES

Questionnaire for Officers Who Have Pursued Someone in a Motor Vehicle

1. How long have you been a trooper/police officer/sheriff's deputy?
 1. Please describe your work history as a trooper/police officer/sheriff's deputy.
2. In the past year, how many pursuits have you participated in? Whether you initiated or assisted.
 1. In your experience, what kind of infractions led to these pursuits? What is the proportion?
3. What is your department's official policy on pursuits?
 1. What are your thoughts on the department's pursuit policy?
 1. How do you feel your department's policy compares to other departments in the state?
 2. How do other officers view the pursuit policy in your department?
 3. (Optional if the department views vary greatly from department policy) Are there any main drivers of the officers viewing pursuits differently from the department policy?
4. What are the most critical aspects of a stop or an infraction that affects your decision to pursue?
5. What is your biggest concern while you are engaging in a pursuit?
 1. Are there other major concerns?
6. When trying to terminate a pursuit, what is your main goal?
 1. Is there stigma around a pursuit not resulting in an arrest?
7. Have these aspects discussed in previous questions changed over your years of service?
 1. Are there any specific events that influenced these changes?
 1. Events could include pursuits or crashes you have been involved with, events involving friends/co-workers/family, other high-profile events in the community or nationally.
8. Are there any other aspects of pursuits that you feel it is important for us to know?

Questionnaire for Community Members Who Have Fled from Police

1. How long have you been driving? Please describe your driving history.
 1. How many times have you tried to flee in a motor vehicle from the police, for example during a traffic stop? You can give me a rough estimate.
 1. How long ago was the most recent time you fled in a motor vehicle?
 2. What kind of vehicle(s) were you driving (e.g., car, truck, motorcycle, etc.)
 2. How many of your friends and family have fled from the police?
 1. What happened in those pursuits, in the end?
 2. What kind of vehicle(s) were they driving (e.g., car, truck, motorcycle, etc.)
2. In your life leading up to the time you (first) fled from the police in a car (first pursuit for those with multiple pursuits), how many times have you dealt with the police?
 1. Would you describe those meetings as negative, positive, or a bit of both?
 2. Are there any details or stories that you would like to talk about when it comes to these meetings with police?
3. Before the time where you fled from police on the road (first pursuit for those with multiple pursuits), did you have any knowledge or ideas about what the policy was for police when someone flees from them? Did you know if they were instructed to chase you or let you go?
 1. Did you know any specific actions that would result in the officer to stop chasing you?
 2. What did people around you, like your friends or family, think about fleeing from police while driving? (give examples if necessary if the question isn't clear to them)
4. In your most recent time fleeing in a motor vehicle, what was the biggest reason that made you decide to flee from the police when you were being pulled over?
 1. Were drugs or alcohol a factor in your decision to flee?
 2. Did you have different reasons for fleeing this time compared to past times fleeing?
5. What was your biggest concern or issue during the police pursuit, while you were trying to get away? Such as escaping, safety of you or passengers, etc.
6. As you continued to flee in the vehicle, did you have an idea of how it was going to end?
 1. As the pursuit came to an end, what were you mostly thinking about? What was the biggest issue?
 2. How did the pursuit end? Did you escape or did the police stop you?
7. Since the most recent pursuit, has your opinion about fleeing the police changed?
 1. If so, how has your opinion changed? Are there any specific things that have happened that changed your mind?

2. If you haven't changed your mind, what would change your mind about making the decision to flee the police?
 3. What would you do the next time you're pulled over?
 4. Is there anything law enforcement can do or change that would stop you from fleeing?
8. Are there any other things about the pursuit that you feel we should know?

Questionnaire for Public Defenders

1. How long have you been a public defender?
2. In the past few years, how many clients have you represented who had participated in a pursuit? Whether as a passenger or driver.
 1. In your experience, what kind of infractions led to these pursuits? What is the proportion?
3. To the best of your ability, what are the typical reasonings for fleeing?
 1. What other infraction (if any) had those clients committed?
4. What are your thoughts on the current state of pursuit policy in law enforcement?
 1. How do you feel Minnesota's policies compare to other states?
5. Have aspects discussed in previous questions changed over your years representing people?
 1. Are there any specific events that influenced these changes?
 1. Events could include pursuits or crashes you or clients have been involved in, events involving friends/co-workers/family, other high-profile events in the community or nationally.
6. Are there any other aspects of pursuits that you feel it is important for us to know?

APPENDIX 5: NARRATIVE SEARCH TERMS

“intentional motor vehicle crash”

“Single vehicle collision”

“car” or “vehicle” and (“parked” and “tracks”) or (“train” and (“collide” or “crash”))

“drive into” and “lake”

“drove off” and “cliff” or “bridge”

“oncoming” and “tractor” or “semi” or “vehicle”

(“collided” or “crashed” or “drove”) and (“semi” or “vehicle” or “pillar” or “median” or “pole” or “tractor”)

APPENDIX 6: NVDRS CIRCUMSTANCE GROUPING

Study Grouping	NVDRS Variables				
Mental Health	Depressed Mood	Mental Illness Treatment, Current	Mental Illness Treatment, History	Treatment Non-adherence	Traumatic Brain Injury
History of Suicidal Attempt	Suicide Attempt History				
History of Suicidal Thought	Suicide Thought History				
Disclosure of Suicidal Intent	Suicide Intent Disclosed				
Substance/Addiction	Alcohol Problem	Substance Abuse Other	Other Addiction		
Intimate Partner Violence	Intimate Partner Problem				
Criminal/Legal Issues	Recent Criminal Legal Problem	Other Legal Problem			
Physical Health Problems	Physical Health Problem				
Friend/Family Death	Recent Suicide Friend/Family	Death Friend or Family, Other			
Job/Financial Problems	Job Problem	Financial Problem	Eviction or Loss of Home		
School Problem	School Problem				
Other Circumstances	Disaster Exposure	Anniversary of traumatic event			

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