

Investigating the Relationship Between Workload and Officer-Involved Shootings of
Unarmed Individuals

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Dedication

To my mother, whose encouragement has inspired my passion for learning, writing, and creating works of art and science since my elementary years.

To my father, for cheering me on and for reminding me that taking a break occasionally is, in fact, a necessary step in the writing process.

To my stepfather, whose excitement and support over the course of my thesis project has increased my overall confidence as a researcher.

To my partner, whose belief in me was palpable even from 180 miles away.

To my late grandmothers and great-grandmothers, whose acts of compassion, strength, dedication, and kindness set me on the path I walk today.

To the family of Andy Paine, and to his memory.

And finally, to all of my friends and family members who continually motivate me, contribute to my college career, and share their wonderful lives with me.

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Abstract

This study examines the relationship between officer workload and lethal, officer-involved shootings of unarmed individuals (LOIS-Us) that occurred in the United States between 2016 and 2018. The author created two indices of officer workload, total incident workload, and violent crime workload, using archival data. The indices were created for each state and municipality in which one or more LOIS-Us occurred. The author hypothesized that (1) states with more LOIS-Us would have higher workload indices than states with fewer LOIS-Us, and (2) both workload indices would be higher in municipalities where one or more LOIS-Us occurred than corresponding state-level indices. Unexpectedly, total incident workload was unrelated to LOIS-Us and violent crime workload was negatively correlated with LOIS-Us. Average state workload values were higher than the values in studied municipalities. Future research should explore whether these findings stem from officers with lower workloads having less experience responding to crimes.

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Introduction

Officer-involved shootings in the United States have garnered attention from citizens and politicians alike in recent years. Between 2016 and 2018, a total of 2,937 individuals were fatally shot by police officers in the United States (The Washington Post, 2020). This number is significantly higher than the number of decedents in other comparable, developed countries (Keng, 2016). As more media coverage has been directed towards these events, especially toward those involving unarmed decedents, public opinion regarding the police has become divided, often along political lines (Brown, 2020). For example, 73% of Republicans polled by the Pew Research Center felt that the police were doing an excellent or good job utilizing the correct amount of force in police interactions; in contrast, only 27% of Democrats rated police performance in this area as excellent or good (Brown, 2020). Polarized reactions to these shooting events, especially lethal, officer-involved shootings of unarmed individuals, or LOIS-U, make it difficult to take unified actions to reduce the frequency of LOIS-U. In light of this division, the aim of this study is to analyze LOIS-U from a nonpartisan, behavioral science standpoint by focusing on officer workload as a potential predictor of these events. The evidence-based insights generated from this study could aid in formulating practical, apolitical approaches to reduce LOIS-U.

Most prior studies examining police use of force focus on demographic variables related to the officers and decedents involved in an interaction (e.g., race/ethnicity, gender, etc.). For example, at the level of individual cities, officer demographics may be related to officer-citizen interactions. Indeed, Ba et al. (2021) found that, compared to White officers, Black and Hispanic officers in Chicago used less force against citizens and made fewer arrests and traffic stops. Female officers were also shown to use less force than male officers (Ba et al., 2021). However, this study focused only on the city of Chicago, so the results may not be generalizable to the entire nation. In fact, Klahm and Tillyer's (2010) use of force content analysis found that demographic variables either yield mixed results across studies or do not serve as good predictors of future use of force. For example, the researchers found that neither officer nor suspect race had a significant relationship with overall officer use of force (Klahm & Tillyer, 2010).

To better contextualize these officer and citizen relationships, some researchers have examined situational variables in addition to demographic variables. For example, Granot, Balcetis, and Stern (2017) reported a positive relationship between an area's violent crime rate (i.e., the rate of aggravated assault, robbery, sexual assault, and murder cases) and rates of negative contact between police officers and citizens. Negative contact, in this case, was defined as how much an individual reported feeling discriminated against during prior interactions with police (Granot et al., 2017). Officer responses to violent crimes, as well as the rate of violent crimes in an area, may influence the attitudes of both citizens and police officers in that area. When analyzed at the level of individual neighborhoods, this link becomes even more apparent. Terrill and Reisig

(2003) analyzed specific neighborhoods and found that individuals living in disadvantaged areas with high homicide rates experienced higher levels of physical and verbal force (e.g., threats, restraints, nonlethal strikes, and lethal strikes) from police than did individuals living in more advantaged neighborhoods.

Further, researchers such as Brooks, Piquero, and Cronin (1994) have analyzed the relationship between how many crimes an officer must respond to (i.e., the officer's workload) and the officer's attitude towards their community. These researchers found that officers in busier precincts have more negative attitudes toward their respective departments and communities (Brooks et al., 1994). These negative attitudes may affect how officers approach the community members they encounter or arrest.

The more negative attitudes of busier officers may stem from their level of fatigue. The present author assumed that higher workloads increase officer fatigue by reducing their sleep time and increasing their level of stress. Indeed, archival, survey and interview data collected by Senjo (2011) illustrated a direct correlation between excessive work hours and low levels of sleep. Specifically, Senjo (2011) found that, of fifteen surveyed agencies, officers working in the three agencies with the highest number of average work hours also reported the lowest average hours of sleep a night. In addition, officers generally reported sleeping fewer hours than needed to function at their peak (Senjo, 2011).

Research conducted by Charles et al. (2011) further illustrates the links between workload, stress, and officer fatigue. The mean hours of sleep of male officers in this study, particularly those who reported moderate or high workload, did decrease as

perceived, self-reported stress increased (Charles et al., 2011). Similarly, Neylan et al. (2002) found that stress from an officer's work environment was strongly associated with poor overall sleep quality. Lowered hours of sleep and increased stress have certainly been linked to high workload; in turn, workload and the factors that affect it have also been linked to officer performance.

The low hours of sleep reported by officers may impede officers from cognitively performing at their peak. In general, sleep loss has been found to impair one's ability to devote cognitive resources to detecting important and even dangerous events (McCoy & Strecker, 2011). Sleep loss also impairs one's ability to adapt to a changing, demanding situation and to coordinate one's perception and actions into a response (McCoy & Strecker, 2011). For example, Royal Norwegian Naval Academy cadets who had been deprived of sleep for about a week were made to plan a rescue operation for a stranded, diabetic cadet as a training exercise (Kobbeltvedt et al., 2005). When compared to cadets who were not deprived of sleep, their plans were rated by experts to be significantly worse; in addition, the sleep-deprived cadets estimated more risk inherent in their plans (Kobbeltvedt et al., 2005).

Fatigue studies with police officers have produced similar results. For example, Fekedulegn et al. (2017) found that the prevalence of on-duty injuries sustained by officers increased as a function of officers' fatigue levels. Specifically, officers who did not report feeling active, full of vigor, or alert on the researchers' ten-item questionnaire had a statistically higher prevalence of injuries. Indeed, fatigue has been shown to hamper officer hand-eye coordination, adaptability, and decision-making skills (National Institute

of Justice, 2012). This finding could suggest that poorer executive functioning and vigilance to an officer's surroundings may result in more mistakes and, in turn, injuries (Fekedulegn et al., 2017). Additionally, in simulated interactions with citizens, officers from the day and swing shifts at their respective departments had their simulated scenarios end cooperatively more often than officers in the power shifts (i.e., 12-hour shifts) and grave shifts (i.e., early morning shifts) (James et al., 2018). Of the officer-led trials, 24% of the simulations ended cooperatively, 19% ended neutrally, and 56% ended in deadly use of force; when these scenarios began to escalate, day shift and swing shift officers, who reported significantly less fatigue than officers in other shifts, prevented deadly outcomes 56% of the time (James et al., 2018). In short, the effects of fatigue may, in part, lead officers to use lethal force in cases where such force could be called into question (e.g., with unarmed suspects).

The studies described thus far establish a link between officer fatigue and subsequent judgements that affect job performance. Without the flexibility to respond with unimpaired executive functioning skills, officers may rely on procedural memory, such as practiced weapon use, in situations that do not necessitate the use of a weapon. The present study seeks to examine the relationship between officer workload (a proxy for officer fatigue) and the prevalence of situations in which an unarmed individual is lethally shot.

It should be noted that none of the studies mentioned thus far considers violent and overall response rates at a national level within the context of a police department's workload or size. Further, the studies do not focus specifically on lethal force incidents

involving unarmed individuals. Thus, the present study is the only one known to the present author to address a possible link between officer workloads and nationwide LOIS-Us. The author hypothesized that American states with more LOIS-Us (e.g., California) would have higher officer workloads than states where fewer LOIS-Us had occurred (e.g., New York). This prediction stems from the view that high workload (i.e., responding to numerous crimes and calls) both physically and mentally fatigues officers.

In the present study, this predicted relationship was tested using two workload measures. The first measure, violent crime workload, was defined as the number of robberies, aggravated assaults, and nonnegligent manslaughters an officer would have to respond to in a given year. Although violent crime responses are less time-consuming and less frequent than other calls for service, responding to these crimes may be more emotionally exhausting, as they generally involve higher levels of perceived threat to the officer(s). Indeed, the dangerous situations often encountered when responding to violent crimes (e.g., those in which officers are attacked or use force) were ranked as the top job stressors for officers in research by Violanti et al. (2016). Exposure to critical, traumatic incidents such as those encountered in violent crime responses is also associated with nightmares in police officers (Neylan et al., 2002). Additionally, frequently responding to these calls may increase an officer's vigilance and expectation that violent scenarios could transpire during subsequent calls. Thus, violent crime workload was expected to be especially predictive of (i.e., positively associated with) LOIS-Us.

The second measure, total incident response workload, was defined as the average number of violent crimes, property crimes (i.e., burglary, larceny-theft, motor vehicle

theft, and arson), sexual assault incidents, and highway fatalities an officer would have to respond to in a given year. As highway fatalities are not always the result of a crime, this measure includes overall police responses to a variety of incidents. Calls involving accidents, traffic stops, and property crimes are some of the most common and time-consuming calls that officers must respond to, so this measurement reflects a large portion of an officer's workload (Asher & Horwitz, 2020). As a result, total workload was also expected to be predictive of (i.e., positively associated with) LOIS-U's.

Based on the author's view that fatigue increases the likelihood of lethal response by police officers, the author also hypothesized that violent crime workload and total workload would be higher in the municipalities (e.g., towns, cities, etc.) where LOIS-U's occurred between 2016 and 2018, as compared to those municipalities' corresponding state-level workload measures. In other words, officer workloads in the municipalities where unarmed decedents were shot were expected to be higher than the corresponding state's average officer workload value. The fatigue-lethal response prediction was analyzed without the influence of state-to-state differences in LOIS-U cases by comparing these municipalities' workloads to their corresponding states' workloads.

Methods

Cases

The present author searched online databases of past officer-involved shootings for cases in which unarmed decedents were killed by gunshot wounds. Two hundred LOIS-U cases archived in a database by *The Washington Post* (2020), “Fatal Force: Police Shootings,” and in a similar database from *The Guardian* (Swaine, Laughland, Lartey, & McCarthy, n.d.) met the inclusion criteria for this study. These inclusion criteria specify that, at the time of the shooting, the decedent did not possess a weapon or an improvised weapon (e.g., a firearm, knife, bat, or broken bottle). In addition, decedents included in the study were not driving a vehicle in the direction of officers or bystanders in the vicinity (i.e., utilizing a vehicle as an improvised weapon). Decedents killed in police training accidents ($n = 1$) were also excluded; these incidents generally involve equipment malfunctions rather than an officer’s conscious choice to utilize lethal force. Finally, escaped inmates, including unarmed inmates, were not included in the data. Police officers’ preconceived notions regarding the danger of encountering an escaped inmate may affect an officer’s encounter with these individuals in ways not comparable to other cases considered in this study.

At least one LOIS-U occurred in 41 of the 50 U.S. states between 2016 and 2018. The cases incorporated in this study took place in 170 unique municipalities. In eight of these 170 cities, two fatal OISs occurred within the same year. Only one city, Albuquerque, had three lethal OISs over the course of one year, 2017.

Data Collection

Data utilized to calculate police workload values was gathered for each municipality in which one or more of the 200 LOIS-U's took place between 2016 and 2018. The name of each decedent, the location of the shooting, and the basic details of each LOIS-U were obtained from databases published by *The Washington Post* (2020) and *The Guardian* (n.d.). Population estimates of each municipality in the study were obtained through census data from the United States Census Bureau. Most of the estimates this research included were projected for 2017 through 2019 at the time the data was collected; however, some smaller municipalities only had calculated estimates from 2010. A few particularly small municipalities did not have estimates available from the census, so other sites, such as *Best Places*, were utilized instead (Sperling's Best Places, n.d.). Population estimates were also gathered from the census for each of the 50 U.S. states.

The number of employed police officers in each state and each municipality was gathered from the Federal Bureau of Investigation's Uniform Crime Reporting (UCR) data (Uniform Crime Reporting (UCR) Program, n.d.). Some of this data was organized in a database by *Governing* (2018), which was utilized for cases in 2016. UCR data did not provide officer numbers for 18 small municipalities; thus, the present author gathered data regarding these cities from official police websites or *Police1* (n.d.) databases. Data for three municipalities was garnered through emailing individual departments about the number of police employed in their precinct.

The UCR database also provided the total number of violent and property crimes committed in each municipality and each state. As previously discussed, violent crimes

included aggravated assault, robbery, sexual assault, and murders, whereas property crimes included burglary, larceny-theft, motor vehicle theft, and arson. In addition, the number of highway fatalities in each state and municipality for each year between 2016 and 2018 was gathered from the National Highway Traffic Safety Administration (n.d.) annual reports. These reports only include the total number of people killed in cities with a population of 150,000 or more. Fatality numbers for municipalities that were too small to be listed in this database were substituted with the number for the closest city, by road, to the municipality in question.

Procedure

To calculate violent crime workload values, the number of employed officers per thousand citizens in a municipality was divided by that municipality's violent crime rate in the corresponding year. Total incident response workload values were created by dividing the number of officers per thousand citizens in each municipality by that municipality's violent crime rate, property crime rate, and traffic fatality rate (i.e., the total workload rate) in the corresponding year. These calculations were also made for each state by dividing each state's number of employed officers per thousand citizens by the state's violent and total workload rates, respectively. Separate calculations for each municipality and state were conducted for 2016, 2017, and 2018. Using these calculations, the workload values of municipalities and states that employed a relatively large number of officers and experienced fewer crimes and highway fatalities were relatively low. Conversely, municipalities and states in which fewer officers were employed and more crimes and fatalities occurred had relatively high workload values.

Data Analyses

To test the first hypothesis, that states with more LOIS-U's would have higher violent and total officer workloads, a Pearson correlation coefficient was calculated between both officer workload values, respectively, and the number of LOIS-U's in the corresponding state for each year. The second hypothesis, that workload values would be higher in municipalities where LOIS-U's occurred compared to their corresponding states, was analyzed using a paired samples *t*-test. Violent crime and total incident response workload values served as dependent variables, and municipality versus state were used as the grouping variables. Only the 41 states in which one or more LOIS-U's occurred factored into this second analysis.

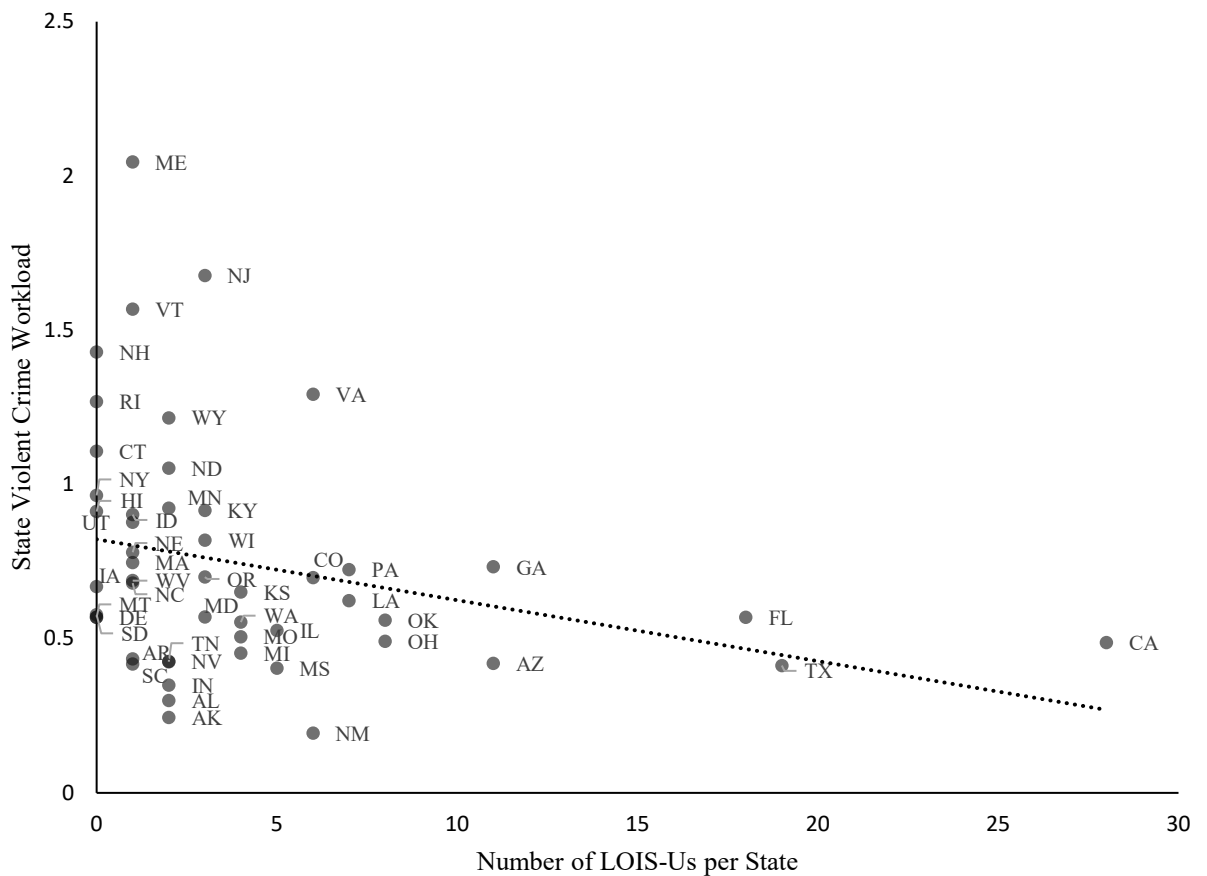
Results

Pearson correlation coefficients (one-tailed alphas = .05) were calculated to assess the relationship between state-level officer workload values and the number of LOIS-U's in a corresponding state. Contrary to the prediction outlined in hypothesis one, the number of unarmed shooting cases per state between 2016 and 2018 ($M = 4.04$, $SD = 5.40$, $n = 50$) and the state *total incident* response workload ($M = 0.08$, $SD = 0.04$, $n = 50$) were not significantly correlated, $r(48) = -0.22$, $p = 0.06$, 95% CI [-1.00, 0.02]. However, the number of unarmed shooting cases per state between 2016 and 2018 and the state

violent crime workload ($M = 0.74$, $SD = 0.38$, $n = 50$) were significantly correlated, $r(48) = -0.28$, $p = 0.03$, 95% CI [-1.00, -0.05]. The state violent crime correlation is illustrated in Figure 1. Analyses excluding traffic fatalities as a measure of workload yielded similar results.

Figure 1.

Correlation Between State Violent Crime Workload and State LOIS-U's



Note 1. All LOIS-U's from 2016 to 2018 are included in this figure and analysis.

To test the second hypothesis, paired sample *t*-tests ($\alpha = .05$) were conducted to compare each LOIS-U's municipality-based total incident workload and violent crime officer workload values to the corresponding state level officer total and violent crime workload values. In terms of total incident workload, the state value ($M = 0.08$, $SD = 0.04$, $n = 41$) was significantly higher than the municipality value ($M = 0.01$, $SD = 0.02$, $n = 41$), $t(40) = 9.38$, $p < .001$, $d_z = 1.47$. Similarly, the state value ($M = 0.71$, $SD = 0.39$, $n = 41$) was significantly higher than the municipality value ($M = 0.10$, $SD = 0.11$, $n = 41$) for violent crime workload, $t(40) = 9.54$, $p < .001$, $d_z = 1.49$. Analyses excluding traffic fatalities in workload values yielded similar results.

The present author conducted additional exploratory analyses because the results of the above analyses contradicted both hypotheses. Specifically, the present author speculated that municipalities with lower officer workloads may have had more officers respond to each crime. Officers in smaller municipalities may have fewer incidents to respond to; thus, multiple officers may arrive to minor scenes to which busier municipalities would not allocate extra officers. A small sample of officer data from 2016 was analyzed through a post-hoc, paired sample *t*-test (two-tailed $\alpha = .05$).

This analysis showed that total incident workload values were significantly higher for cases where only one officer responded ($M = 0.03$, $SD = 0.03$, $n = 7$) than cases in which more than one officer responded ($M = 0.01$, $SD = 0.01$, $n = 13$), $t(19) = 5.64$, $p < .001$, $d_z = 1.26$. Similarly, officer violent crime workload values were higher in cases where only one officer responded ($M = 0.29$, $SD = 0.20$, $n = 7$) than in cases with two or more officers on the scene ($M = 0.08$, $SD = 0.09$, $n = 13$), $t(19) = 3.63$, $p = 0.002$,

$d_z = 0.81$. These results suggest that multiple officers responding to a scene is, indeed, more common in municipalities with lower workload values in this sample.

Discussion

The first prediction, that states with more LOIS-Us would have higher total incident and violent crime workload indices than the total incident and violent crime workload indices of states where fewer LOIS-Us had occurred, was not supported. The number of LOIS-Us in each state tended to be negatively associated with the *total incident* workload values for each state, though the negative correlation failed to reach statistical significance at the .05 alpha level. However, the number of LOIS-Us in each state and the corresponding *violent crime* workload values were significantly, negatively correlated. In other words, states with more LOIS-Us had lower violent crime workloads. The significant result of this analysis contrasts with the results of a prior study that examined only LOIS-Us from 2016; no significant correlation was found within that single year (Zwemer, 2021). This lack of significance is likely explained by the smaller sample size of the previous study.

Similarly, hypothesis two was not supported. The present author hypothesized that total incident workload and violent crime workload would be higher in municipalities where LOIS-Us occurred between 2016 and 2018 compared to those municipalities'

corresponding state-level workload measures. Contrary to these predictions, both workload values were significantly *lower* in municipalities where LOIS-U's occurred than the average workloads of corresponding states. This indicates that LOIS-U's were more prevalent in municipalities that experienced lower numbers of violent crimes, property crimes, sexual assaults, and traffic fatalities per employed officer relative to other municipalities. It should be noted that these results are also inconsistent with findings from the prior study examining LOIS-U's conducted in 2016 (Zwemer, 2021).

These findings contradict the fatigue-lethal response model that the present author utilized to form hypotheses related to officer workload. One reason for this contradiction could be related to the states and municipalities sampled in this study. Workload indices were created only for municipalities in which LOIS-U's occurred; in turn, these indices were compared only to the indices of states with reported LOIS-U's between 2016 and 2018. The sample could exclude populous areas with high workload indices for the officers who work there simply because no LOIS-U's were reported for that area within the set timeframe. For example, despite the high population and potentially high officer workload for New York City and for the state of New York, no LOIS-U's occurred in the city or the state between 2016 and 2018. Thus, these places were excluded. In short, other areas that could have officer workloads much higher or lower than those sampled in relation to LOIS-U's may have been excluded from the data based on our study's cutoff period.

Further explanation for these findings could lie in an officer's awareness of being tired. Manousakis et al. (2021) found that young adults who had been sleep deprived

before an alertness task were aware of their own fatigue before objective deficits occurred in their task performance; this awareness remained stable across different levels of sleep deprivation. Police officers likely have comparable warning systems for feelings of tiredness. In response to sleepiness, officers may alter their decision-making strategies while interacting with citizens to avoid harmful outcomes. For example, tired officers may consciously double-check whether an ambiguous (but non-lethal) object is being held in a person's hand during an interaction. This officer's urge to check again may prevent the use of excessive force if the object is, in fact, not a weapon (e.g., a cell phone). Further research should analyze officers' awareness of their own fatigue levels and the effects of that awareness on officer-citizen interactions and lethal force use.

Another potential explanation for these unexpected findings could relate to officer experience. Officers in areas with lower violent crime workloads are, by definition, responding to fewer violent crimes and other threatening scenarios than officers working in areas with higher violent crime rates. A lack of exposure to these scenarios may leave inexperienced officers less prepared to respond in a non-lethal manner to these situations. Indeed, Vickers and Lewinski (2011) found differences in shooting performance based on police officers' level of experience. In a simulated scenario, a suspect turned around to face officers while holding either a gun or a cell phone; in these situations, rookie officers were found to have significantly lower shooting accuracy, decision making accuracy, and overall performance scores than elite officers (Vickers & Lewinski, 2011). Specifically, rookie officers tested at the end of their training program were less accurate when they fired their weapon, and they mistook cell phones for guns more often than elite officers

with extensive field experience in situations involving armed individuals (for alternate findings, see Landmen et al., 2015). These findings are relevant to low-workload municipalities in the U.S, which were often located in rural areas of the United States, and they indicate that experience is a valuable facet to the stable performance of police officers in officer-citizen interactions.

Coupled with the effects of on-the-job experience, officers in low workload (i.e., rural) areas may not have a comparable education level to those who were educated in and, subsequently, work in more populated places. As access to educational funding and resources tends to be lower in rural areas (Lavalley, 2018), officers in these municipalities may be entering the force with less educational experience than those in larger municipalities. Further research could glean more information regarding how newly hired officers or officers with less work experience approach violent crimes, especially for officers in rural areas.

Officers in low-workload municipalities, due to a lack of incidents to respond to, may also report in higher numbers to the crimes that do occur in their area. Indeed, post-hoc analyses presented in the results section of the present study indicated that more officers responded to incidents in low-workload municipalities with reported LOIS-U's. The presence of multiple responding officers may influence the outcomes of interactions between officers and unarmed citizens in ways that increase the likelihood of a LOIS-U event. For example, issues related to officer stressors, officer communication, and social facilitation could arise when a large number of officers are present at the scene of a crime.

Officers rank losing a fellow police officer in the line of duty as one of the most taxing occupational stressors they face (Violanti et al., 2016). Officers who have close relationships with their coworkers may prioritize the safety of their fellow officers over the safety of civilians in the event that a coworker is on the scene. Though injuring someone in the line of duty has also been cited by officers as stressful (Violanti et al., 2016), some officers may feel that acting quickly and with lethal force to address any perceived threats could guarantee the safety of their coworkers; thus, when multiple officers are present at a scene, officer priorities may compete with proportional use of force. Further studying officers' feelings of responsibility and concern towards other officers could allow researchers to better understand officer-decedent interactions in which multiple officers respond to a call involving an unarmed civilian.

Difficulties in communicating between numerous officers on a scene may also complicate incident responses. A higher number of responding officers could potentially create communication difficulties in tense situations. Miscommunications could occur between officers who mistakenly perceive a weapon in the hand of a suspect. Additionally, officers may give mixed or contradictory directions to an individual who they are attempting to arrest; in these cases, the individual may be characterized as noncompliant or threatening solely because the person is physically unable to comply with numerous officers' requests simultaneously. If officers do not strategize as to who is taking the lead in a certain scenario, issuing conflicting demands could cause confusion that affects the entire officer-citizen interaction. Dashcam and bodycam footage of many LOIS-Us between 2016 and 2018 include some of these miscommunications.

In like manner, increased noise from multiple officers talking or turning on their squad car sirens may affect officer performance. Vrij et al. (1995) found that contextually relevant street noise (e.g., noise from nearby businesses, passerby conversations, etc.) in a shooting situation increased emotional responses of nervousness from participating officers; likewise, this noise decreased the officers' ability to recall physical features of assailants and bystanders in the simulated interaction. Based on the effects of general street noise, the noise contributed by multiple on-scene officers may be a relevant factor that decreases overall performance of police officers in these interactions.

Lastly, an officer's decision to shoot may be influenced by social facilitation. Social facilitation theory postulates that the presence of an audience or fellow co-actors prompts an individual to perform well on easy or well-learned tasks; conversely, an audience or fellow co-actors may hinder an individual from performing well at a difficult or poorly learned task (Zajonc, 1965). Similarly, groups engaged in the same activity are especially likely to fall back on well-learned, "go-to" actions when performing a task. Police officers spend a significant amount of time on firearms training, and as a result, the use of a firearm may be their dominant response in threatening situations.

The addition of more officers to a scene may increase arousal in officers, as well. This emotional arousal has been linked to an increase in dominant, well-learned responses in groups of individuals (Curran & Thomas, 2011). Not only could an officer's ability to attend to the situation at hand be reduced by the presence of another police officer, but this arousal could also inhibit less-practiced responses of de-escalation (Curran & Thomas, 2011). Training officers more extensively in de-escalation tactics

before they engage in these situations may reduce the effects of social facilitation. Thus, further studies should analyze officer training as a factor in establishing, maintaining, and facilitating de-escalation or other non-lethal responses to the potentially threatening individuals that officers may encounter.

A major strength of the current study is its replicability. That is, other laboratories and organizations could also run the present (and other) statistical analyses on the data employed in this study, as the databases utilized in these analyses are publicly accessible and expanded yearly. The ability to continue performing these analyses and note whether, with more data, officers in municipalities with lower workloads continue to be more frequently involved in LOIS-U is paramount to fully understanding this relationship over time. Additionally, to the best of the present author's knowledge, this study is the first to comprehensively include and address LOIS-U and their specific relationship with officer workload. As previously discussed, cases in which a decedent is fatally shot by a police officer or officers while unarmed are given particular attention in American media. Addressing these events is paramount to understanding use of force as a whole.

Unfortunately, the lack of a centralized, complete source of police and crime data limited the findings of this study. Law enforcement agencies are not required to provide data regarding crimes or employee numbers to the FBI's UCR database; thus, missing data is hard to address, as some departments do not report to the UCR database at all (Banks et al., 2016). Census data, particularly from small municipalities, is also limited and may make workload calculations difficult when a LOIS-U occurs in a less populated or infrequently surveyed area. In addition, LOIS-U and other use of force incidents take

time to process and submit to databases (Beck & Uchidna, 2019). Thus, incidents may only be accounted for months after they occur. However, continuing to study and examine the data that is available is still valuable to understanding use of force behavior and officer workload. The insights gained from these analyses could benefit U.S. policing systems, officer-citizen interactions, and even the training standards and working conditions of police officers.

As previously mentioned, future research should build on and analyze this data to determine whether these results continue over time. Understanding the patterns of where LOIS-Us occur could eventually allow researchers to predict areas that could be at risk of a LOIS-U event. Additionally, further research should expand on the effects of officer experience and subsequent measures of performance, particularly on decision to shoot tasks. Increased understanding regarding the experiences of newly trained officers may allow training programs to better prepare these officers for the situations involving unarmed citizens that they will face upon entering the force. Lastly, more research should be conducted regarding the effects of multiple on-scene officers on officer stressors, officer communication, and social facilitation effects between these officers. All of these factors could be influencing officers' decisions to use lethal force; to reduce the frequency of LOIS-Us, the group dynamics of officers must be better understood from a behavioral science standpoint.

In conclusion, this study embodies a new approach to understanding officers' decisions to utilize lethal force. Cases in which decedents were unarmed have captured the attention of the public in recent years; thus, this exploration of workload manifests

itself as a relevant addition to current knowledge regarding policing in the U.S. The present study and future research derived from these findings could potentially generate practical, nonpartisan solutions to reducing the number of LOIS-U.s in the United States. In turn, loss of life could be reduced during police-citizen interactions, and systems of policing in the U.S. could be improved through the application of empirical evidence to areas at risk for LOIS-U.s.

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