# Converting Body-Worn Camera Footage into Actionable Data:
## The Complex Social Interactions Lab


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Washington State University
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# Complex Social Interactions (CSI) Lab

***Mission:***

- The Complex Social Interactions Lab is committed to developing new behavioral science methodologies and technologies that can be utilized in real world applications to investigate police officer decision-making and interpersonal interaction by examining unredacted footage recorded by officer body worn cameras (BWC).

***Status:***

- Analysis of over 6,000 hours of BWC footage.
- Provisional Patent on technology to automate the detection of events in footage.

***Funding Sources:***

- Axon International – 60 Body-Worn Cameras and Storage
- Applied Physics Lab of John Hopkins – **$35,000** Gap Analysis of Body-Worn Camera Research
- National Institute of Justice – $1-Million to Study The Impact of Legalization of Marijuana on Police Practice
  - CSI is analyzing BWC and In-car camera footage associated with marijuana-Incidents
- Washington State Traffic Safety Commission - **$135,000**
  - Studying Procedural Justice in Traffic Stops
- WSU Grand Challenge - **$52,000**

# Core Research Team

Dr. Rachel Bailey
Co-Investigator
Application of autonomic psychophysiological metrics

Dr. Bryce Dietrich
Co-Investigator
Collection and analysis of audio analytics
Building automated software

Dr. Dale Willits
Co-Investigator
Modeling of Time Sequencing Techniques
Microsocial Analysis

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Lab Manager

# Three Schools of Thought

1. Technology modifies police practice (Transformative).

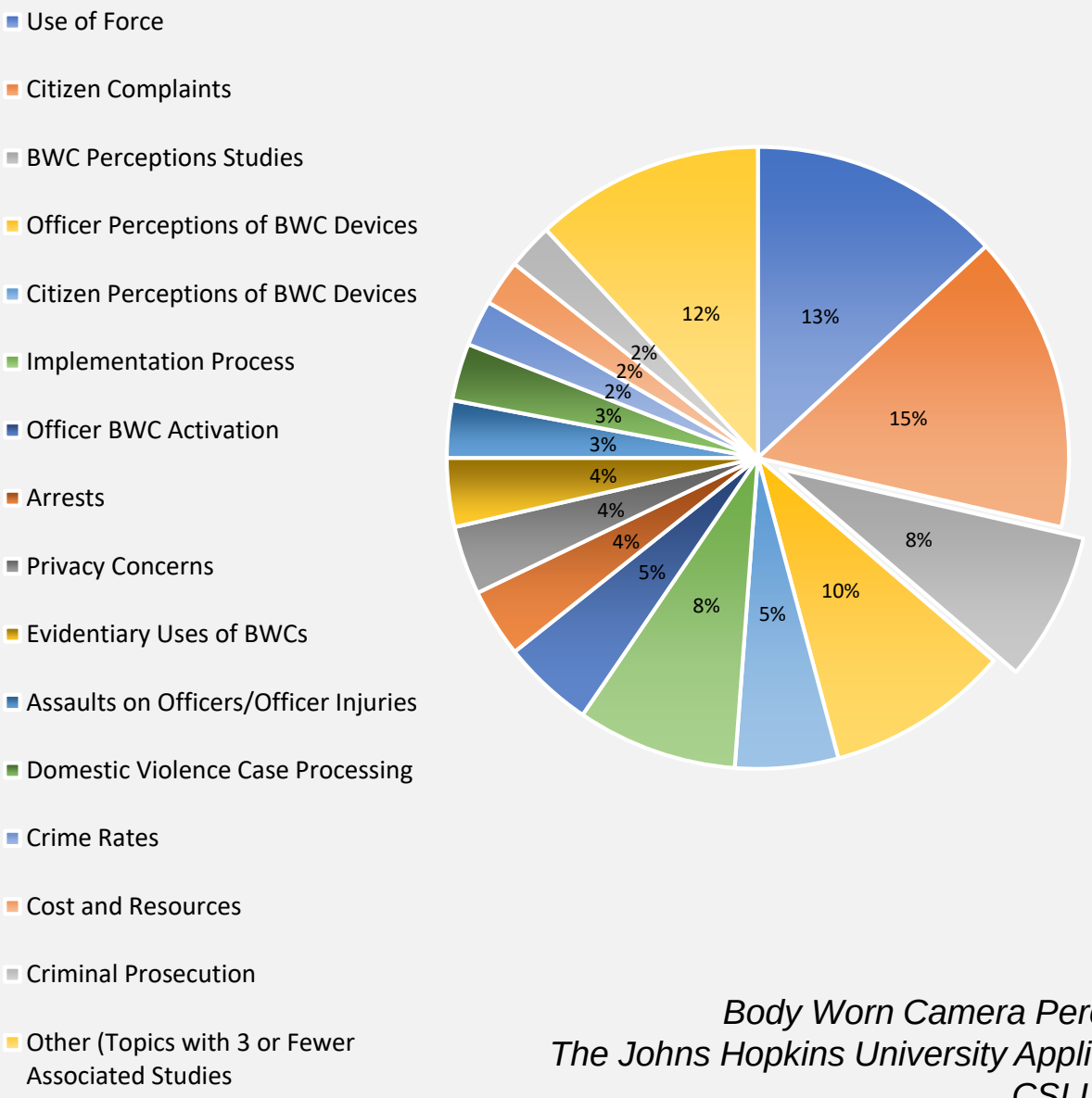
2. • Technology is used to replicate traditional police practice.

3. Technology is a ploy in power by administrators to demonstrate "professionalism" regardless of how the technology is actually used.

# Body Worn Camera (BWC) Use in Policing

- Evidentiary Purposes
- Complaint Resolution/Reduction
- Police Accountability/Transparency
- Liability Protection/Lawsuit Reduction
- Supervisory Review
- Decrease in Incivility (Officer/Citizen)
- De-Briefing/Training Opportunities
- Improved  Officer Safety
- Use of Force Reduction
- Robust Use of Force Review
- Criminal Justice System Efficiency
  - Case resolution without trial

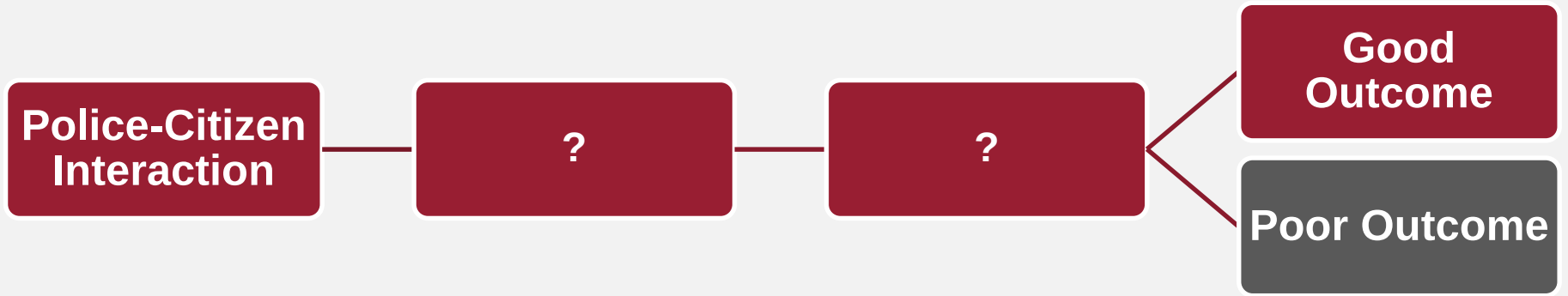
# Current Reality for Policing

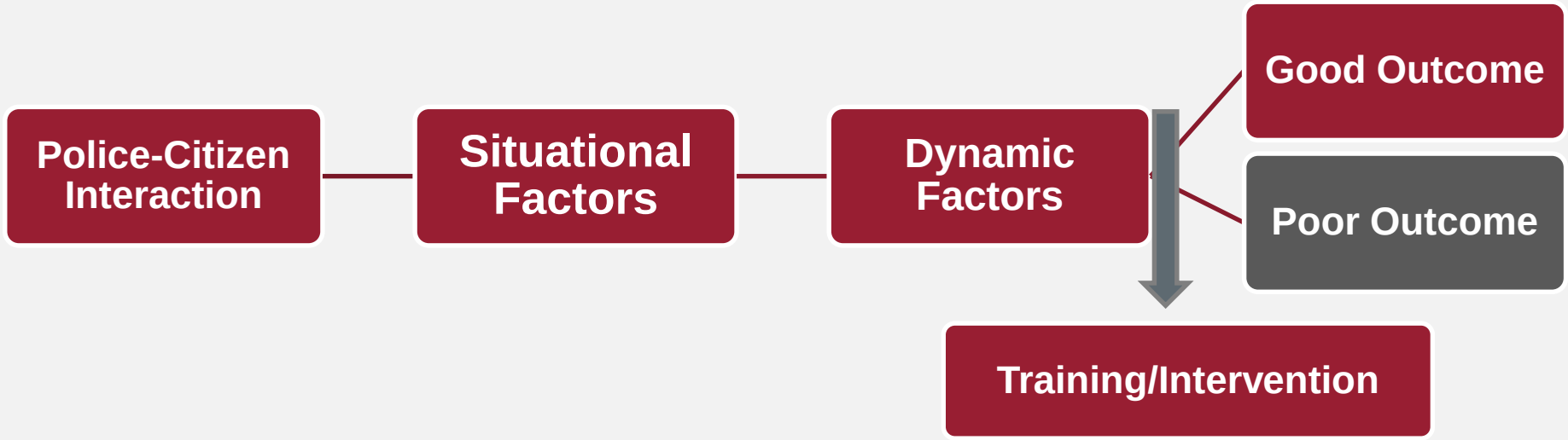



Body Worn Cameras are being treated as an **intervention** and not as a source of **valuable data**.

*Body Worn Camera Perception Study Phase 1*
*The Johns Hopkins University Applied Physics Laboratory (JHU/APL)*
*CSI Lab*

# Understanding Officer Decision-Making and Interpersonal Communication Requires More than Examining the End Result



# Body Worn Camera (BWC) Data Opportunity

- **Risk Management Tool**
  - Key Performance Indicators
    - Assess adherence to policy and protocol.
      - Did X occur? When did X occur? It either happened or did not.
        - Automate compliance (95% BWC Activation Rates)
  - Identify best practices and high performance officers
    - Train via best practices.
  - Evaluate use of force beyond *if* it happen.
- **Cost-Benefit Tool**
  - Evaluate the impact of training and interventions
  - Improve occupational health and wellness of officers
    - Early identification of injury, stress, and burnout
- **Improve Outcome Measures**
  - Improve community interactions
  - Early warning system for problematic areas
  - Early identification of community changes – antagonism, presence of graffiti, or other environmental or contextual changes.

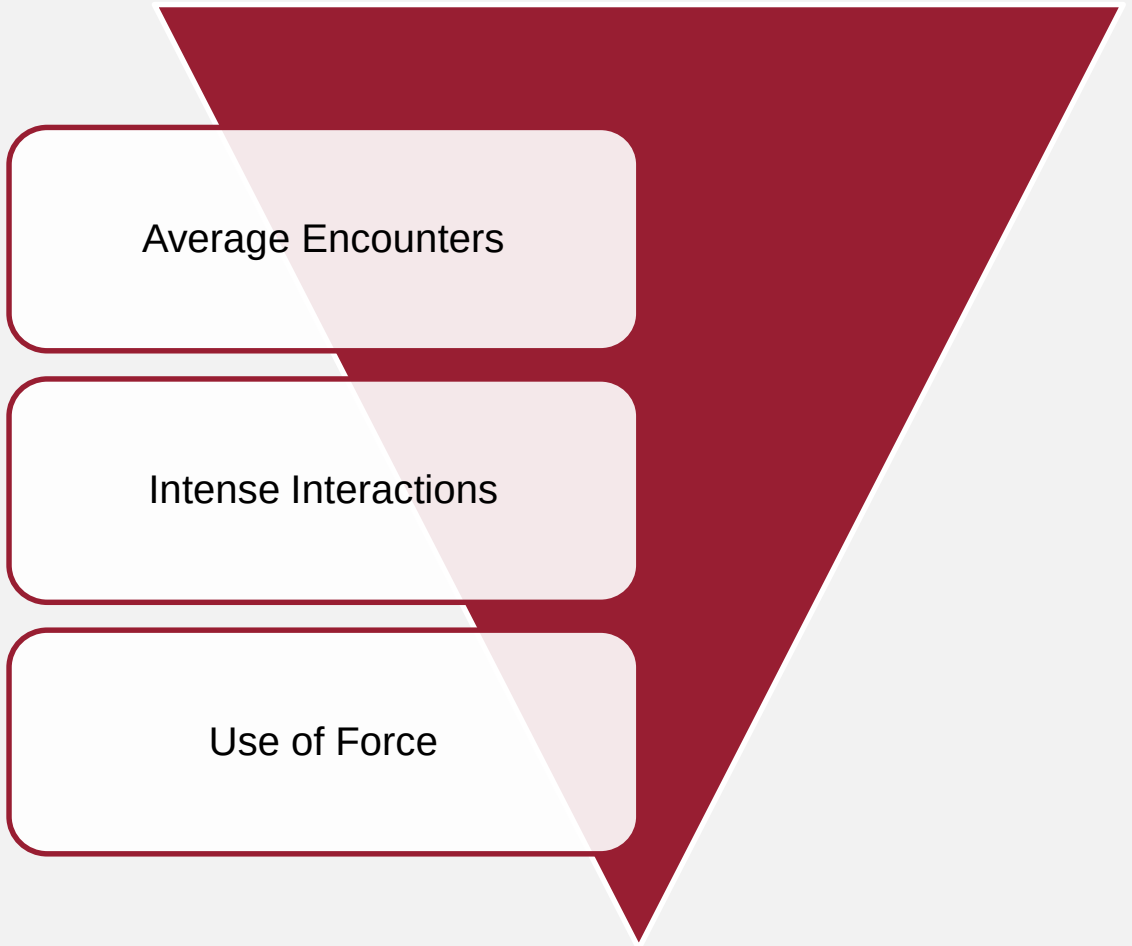
# BWC Data as a Risk Management Tool
# Two Pilot Studies

## Use of Force Incidents

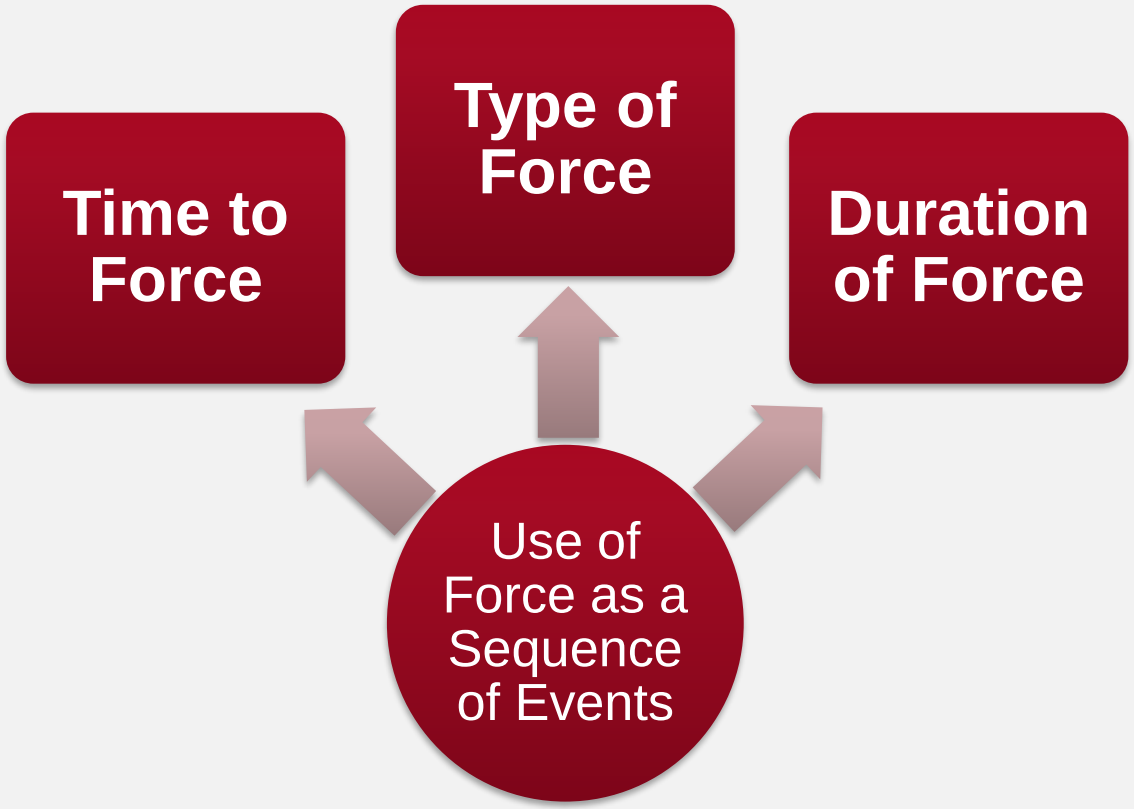
- Approach Use of Force as Microsocial Interactions.
- We must treat police interactions as complex social interactions by contextualizing those interactions via the Situational And Dynamic Factors Associated With Use Of Force.
- Not merely if force occurred. Rather, how did that force occur, and arguably more importantly, why did force not occur in this incident.

## Emotionally Intense (Stressful) Interactions

- Little is understood about the context of police-community interactions, and even less is known about how and when interactions become emotionally charged.
- Though it is generally agreed that policing is an emotionally demanding and stressful occupation, limited research has established what makes an interaction more or less emotionally charged.


Average Encounters
Intense Interactions
Use of Force

# Preliminary Study on Use of Force




## Results of the Initial Analysis

1. When a suspect is actively resisting, police take significantly longer to use force.
2. Police were more likely to use force against males.
3. Police were not more likely to use force against African-American suspects.
4. Police take *less time* to use force against African-American suspects (and more time against white suspects)*

# Follow-up Study on Use of Force

## Explaining the Results in Study #1

- Why were police faster in using force against African-American suspects?
- Were these interactions somehow different?

## Understanding the Difference

- Are these interactions emotionally different?

# Method

**Collected a Sample of Criminal Contacts**

- 218 Criminal Code Violations with No Use of Force
- 70 Criminal Code Violations with Use of Force

**Analysis: Coding of Incidents**

- 69 Pre-Event Variables + 13 Use of Force Variables Collected per Force Event
- ***Objective Coding Structure***
  - Minutes/Seconds; Present/Not Present; Location
- ***Subjective Coding Structure***
  - Emotionality: Intensity and extent of a negative emotional state; Noise Level

# Sample of Factors

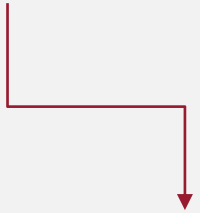
| Predictors | Outcome Measures |
|---|---|
| **Suspect Characteristics** | **Time to *First* Force** (TtFF - The M:S of the first applied force level) |
| Gender | **Level of Force** (LoF) |
| Race | **Duration of Force** (DoF - The M:S when force occurs until the suspect is *both* restrained and under control) |
| Ethnicity | |
| **Suspect Resistance** (Active) | |
| **Suspect Impairment** (Drugs/Alcohol) | |
| ****Emotionality** (Aggressive Cues, Provocation, Levels of Aggression, Profanity, Racial/Derogatory Slurs) | |
| **Environmental Factors** | |
| Time of Day | |
| Location | |
| **Profanity** (Yes/No) | |
| **Delusional State** (Yes/No) | |
| **Number of Officers on Scene** | |
| **Time to Contact** (TtC – The minute and second (M:S) when the officer clearly made it known they were a police officer) | |

# Situational Context: Emotional States & Behavior

| Variable | Description |
|---|---|
| **Aggressive Cues (Suspect/Officer)** | Examples include: Posturing, making a fist, Indications of the intention to start a fight |
| **Provocation (Suspect/Officer)** | Yes/No |
| **Type of Provocation** | Verbal, Physical, Both |
| **Profanity (Officer/Suspect)** | Yes/No; # of Times, TtfU |
| **Racial/Derogatory Slur (Officer/Suspect)** | Yes/No; # of Times, TtfU |
| **Negative Emotional State of Officer/Suspect** | 0 = No negative emotional state<br>1 = Low negative emotional state<br>2 = Medium negative emotional state<br>3 = High negative emotional state |
| **Level of Intensity** | 1 = Normal Situation<br>2 = Medium Level of Intensity (your attention is drawn by the video)<br>3 = High Level of Intensity (you would feel the need for someone to react) |

# Results

- Situations with high levels of intensity and situations with higher levels of aggression are more likely to result in use of force.
  - A 1-unit increase in the emotional state of the officer is associated with an over 1100% ($e^{2.564} = 12.988$) increase in the odds that force is used.



- This result is not particularly surprising, indeed, as it would be highly problematic if police used force often in calm interactions.

- Early results showed that police are significantly more likely to use force against African-American and Latino suspects and use force faster against them as well.
- However, once emotionality of the officer and suspect, situational intensity, and suspect behavior are accounted for, police are no more likely to use force against African-Americans or Latinos than White suspects.

# Converting BWC Footage into Actionable Data

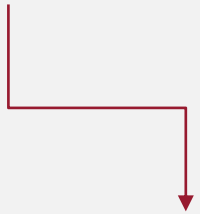
- If interactions with African-American and Latino suspects are primed for higher initial levels of emotional intensity on the part of the suspect, what works to de-escalate the situation?
- Are certain officers better able to de-escalate the situation?
  - How do you identify them?
    - Audio Analytics
      - Classification based on intensity of the interaction.
- When did the interaction start escalating?
  - New Way to Think About Hot Spot Analysis
    - Officer
    - Suspect
    - Community
- Effectiveness of Interventions
  - Training Effectiveness
  - Counseling
  - Administrative Leave
- Officer Health and Safety
  - Stress and Decision-Making

# Emotionally Intense (Stressful) Interactions Pilot Study #2

- Little is understood about the context of police-community interactions, and even less is known about how and when interactions become emotionally charged.

- Though it is generally agreed that policing is an emotionally demanding and stressful occupation, limited research has established what makes an interaction more or less emotionally charged.

- Higher stressful events are associated with greater odds of poor outcomes.



What are the individual and situational-level factors that affect suspect and officer negative emotional states during police-citizen interactions?

# Method

## Larger Sample

- Unredacted BWC footage recorded between June-October 2016
- Collected from a municipal police agency serving a university community
- 287 incidents total, all criminal code violations
  - 101 officer-initiated
  - 186 dispatch-initiated

# Outcomes

- **Emotional States**

  0 = No negative emotional state

  1 = Low negative emotional state (calm throughout interaction with some negative emotional expression)

  2 = Medium negative emotional state (signs of agitation, distress, or sustained irritability)

  3 = High negative emotional state (wailing or rage; highly intense emotional displays)

- Collected for both officers and suspects

# Predictors

| Variable | Hypothesized Effect | Definition |
|---|---|---|
| **Suspect Characteristics** | | |
| Male | + | 1 = male, 0 = female |
| Nonwhite | + | 1 = nonwhite, 0= white |
| Drug/Alcohol | + | 1 = suspect appears under the influence, 0 = no signs |
| **General Behaviors** | | |
| Interruptions | + | 0 = No interruptions; 1 = 1-2 interruptions; 2 = 3 or more |
| **Unique Officer Behaviors** | | |
| Statement of BWC Recording | + | 1 = Officer statement of BWC recording, 0 = no statement |
| Procedural Justice | + | 1 = Informed the suspect of the stop reason, 0 = did not inform |
| Proactive Stop | + | 1 = Proactive stop, 0 = dispatch initiated |
| **Environmental Factors** | | |
| Bystanders Present | + | 1 = Bystanders present, 0 = no bystanders present |
| Bystander Interaction | + | 1 = Bystanders interact with officer, 0 = no bystander interaction |
| Demographic and Population Shift | + | 1 = Shift, 0 = No Shift |
| Shift Overlap | + | 1 = Incident occurred during shift overlap; 0 = no shift overlap |

# Findings

## Factors Increasing NES

### Suspect Negative Emotional State
- Officer Negative Emotional State (10x)
- Officer Interruptions (2-5x)

### Officer Negative Emotional State
- Suspect Negative Emotional State (12x)
- Suspect Interruptions (High Levels – 5x)
- Adversarial Tone (3x)
- Bystander Interactions (10x)
- Population Increases (3x)

## Factors Decreasing NES

### Suspect Negative Emotional State
- Suspect was Male (50% Decrease)

### Officer Negative Emotional State
- Shift Overlap (54% Decrease)

**Not significant:** Race, Procedural Justice, Officer Initiated Contact, Bystanders Present

# Discussion and Future Research

- Our Pilot Studies provides a baseline to establish how to examine police-citizen contacts by exploring negative emotional intensity and use of force.
  - Essential for evaluations on the success of de-escalation training and identifying best practices towards de-escalating a situation.

- Are there certain officer characteristics that lower or increase the odds of emotional escalation?
  - Training
  - Personality
  - Experience

# Become a Participating Agency

- Provide a Neutral Third-Party Review
  - Develop Training Sets of Best Practices
  - Approach Use of Force Review from a Different Perspective
  - Examine Police-Community Contacts from a Holistic Approach
  - Evaluate Training and Interventions
- Approved Security Protocol for Managing BWC Footage
  - For Cloud Storage and Server Storage Systems
- Implement a Pilot Program
  - 60 Generation 1 and Generation 2 Axon Body-Worn Cameras
- Agency Specific Memorandum of Understanding and Data Use Agreement
  - Assistance in Navigating Legal and Policy Issues
- Background Security Clearance for all Annotators and Researchers
- Interdisciplinary Research Team with Industry Collaborators

# Body Worn Cameras ≠ Intervention

- **Treating BWC as data …..**
  - Compliments existing risk management practices
    - Determine adherence to policy
      - Automate compliance checks for BWC activation (95% Compliance)
  - Increases evaluation of training and interventions
    - Documents interactions and environments
  - Improve officer health and safety

# Contact Information

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