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Police Use of Force Escalation and De-escalation: The Use of Systematic Social Observation With Video Footage

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Abstract

As police agencies continue to incorporate body-worn cameras, it becomes increasingly important for researchers and practitioners to explore how to best use these data to better understand patterns of suspect and police behavior. Thus, drawing on a joint project between the Federal Law Enforcement Training Centers and Arizona State University, we expand on prior research demonstrating how social systematic observation (SSO) can be used with video footage to methodically detail the evolving nature of police-suspect encounters. We then illustrate how the data could be evaluated within the framework of escalation and de-escalation using an expanded version of the Resistance Force Comparative Scale (RFCS) first developed and employed in 2001. Finally, we assess the merits and challenges of using video footage to account for suspect and police behaviors in relation to escalation and de-escalation.

Keywords

police, use of force, systematic social observation, escalation, de-escalation dashcam, body-worn cameras, videos

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Introduction

High-profile use of force incidents continue to raise public concern about officer judgment and decision making when using force. Within this context, there is a pressing need to better understand officers' de-escalation techniques as an alternative to using force, as well as what behaviors might escalate a situation. To do so properly, however, one must consider the developmental nature of police-suspect encounters, as such events involve an interactional process whereby suspects and officers may engage in numerous forms of behavior (Bayley, 1986; Bayley & Garofalo, 1989; Fyfe, 1988, 1989; Sykes & Brent, 1980, 1983; Terrill, 2003; Toch, 1969). More specifically, failure to account for *when* varying types of resistance and force occur within an encounter, and a host of potential predictors, provides neither a complete nor accurate picture of how or why officers apply their coercive powers.

Historically, the most effective way to tap into the interplay of police-suspect encounters has been to employ a Systematic Social Observation (SSO) methodology during patrol ridealongs (Mastrofski et al., 1998). However, such an approach is labor intensive and costly. For example, the Project on Policing Neighborhoods (POPN) cost $1.9 million 25 years ago—accounting for inflation the equivalent of $3.2 million in 2021. However, with the emergence of dashboard cameras initially, and more recently officer body-worn cameras (BWCs), the opportunity to observe police-suspect encounters may not only be more cost efficient but offers the potential for an even more accurate accounting of behaviors.

To date, there are only three studies that have sought to identify the benefits and challenges of using video data, and which offer analytical approaches to assess suspect resistance and police use of force behavior (Makin et al., 2021; Sytsma et al., 2021; Willits & Makin, 2018). While these studies provide valuable insight, they were limited in scope in relation to consisting of a single agency with relatively few cases (less than 200 in total across the three studies). Thus, as part of a joint project between the Federal Law Enforcement Training Centers (FLETC) and Arizona State University, we expand on prior research and demonstrate how SSO can be used with video footage to methodically detail the evolving nature of police-suspect encounters. We then illustrate how the data could be evaluated within the framework of de-escalation and escalation using an expanded version of the Resistance Force Comparative Scale (RFCS) first developed and employed 20 years ago. Finally, we draw on over 500 videos (both dashcam and body-worn) from two agencies to assess the merits and challenges of using video footage to account for suspect and police behaviors in relation to escalation and de-escalation.

Literature Review

We begin with a brief description of using video-based footage within the context of social science research in general. We then hone in on prior research that has used police dashboard videos and BWCs (the two data sources used for the present inquiry),

followed by those studies most directly related to police use of force and highlighting the importance of drawing on a SSO methodology.

Use of Video in Social Science Research

For the better part of the past 20 years, there has been a steady increase in the use of video footage captured across a number of varying domains (e.g., CCTV, cell phones, home security systems, GoPros, and BWCs). Such technology offers researchers an enhanced opportunity to study human interactions in social science research (Jordan & Henderson, 1995; LeBaron, et al., 2018). Nassauer and Legewie (2019, *p*. (3) highlighted three main advantages of using video data in research: (1) greatly improves the ability to analyze human interactions and situational dynamics, (2) allows researchers to capture highly detailed events with greater reliability while reducing the risks of observer bias, memory gaps, and missed data, and (3) increases transparency and the ability to share data among researchers.

Researchers have also highlighted the usefulness of video from both an inductive and deductive perspective and for use in qualitative and quantitative research (Derry et al., 2010; Nassauer & Legewie, 2019). Jewitt (2012) noted that video works particularly well for exploratory research because it offers a complete view of events that can be watched multiple times. Relatedly, video allows researchers to examine temporal sequences of events more closely, which allows for a more nuanced understanding of the factors that influence interactions.

Yet, there are a number of issues and challenges with using videos. For example, a key benefit as well as challenge, is the sheer volume of data. Unlike other data sources, video provides a second-by-second multimodal (audio, visual, temporal) account of events that involve humans, physical space, environmental elements, and situational context (LeBaron et al., 2018). So, although such data may be rich in content and provide many opportunities, researchers must be especially mindful to scope their research questions, and importantly methodological approaches, with careful consideration of the time, labor, and expertise required to code and use such data.

Police Dashboard Camera Videos. A small number of researchers have explored specific aspects of police behavior using dashcam video footage. Dixon, Schell, Giles and Dragos (2008) used a sample of 313 dashcam videos of traffic stops from the Cincinnati, Ohio Police Department to examine communication behaviors (e.g., respect, politeness, dismissiveness, indifference, and air of superiority) in an attempt to understand differences based on race. They found that Black drivers experienced more extensive policing (e.g., longer stops, more officers present, questions about drugs or weapons, and searches) than did white drivers. Results also showed that officer communication tended to be more negative when speaking with drivers of another race versus the same race. In addition, Black drivers used less accommodating language (e.g., apologetic, courteous, and respectful) compared to White drivers and this finding

was correlated with longer traffic stops. Unfortunately, the authors did not examine police use of force behavior as part of their study.

In another study, Worden and McLean (2014) coded 539 dashcam videos from the Schenectady, New York Police Department to examine how often officers used procedurally just or unjust actions based on various procedural justice subscales. Similar to Dixon et al. (2008), Worden and McLean (2014) did not examine overt uses of force (e.g., searches, physical force, and commands), but relevant to the present study, they drew on SSO, which offers much promise within the context of using videos in police research.

Originally adapted by Reiss (1971) to study the police as part of conducting field research, SSO has been used in a variety of in-person (e.g. ridealongs) observational studies over the years (e.g., Police Services Study, Project on Policing Neighborhoods Study, University of Cincinnati Observational Study, and Flint Observational Study). As stated by Mastrofski et al. (1998, p. Vii):

> SSO systematizes field methods for teams of researchers who observe the object of study (in this case, the police) in its natural setting. Researchers record events as they see and hear them and do not rely upon others to describe or interpret events. The researchers follow well-specified procedures that can be duplicated. For example, researchers who wish to record whether officers are respectful to complainants must define "respectful" and "complainant" in such a manner that other researchers record these terms in the same way when observing the same and similar situations. This makes it possible for many researchers to conduct observations, rather than relying on the observations of just one. Furthermore, the observation is conducted independent of the object of observation—the researcher does not rely on the officer's report as to whether he or she treated a complainant with respect; the researcher makes that observation and judgment.

As such, SSO offers an established and rigorous methodological framework that is readily applicable and transferable to using video recorded footage. Indeed, like Worden and McLean (2014), researchers have been using SSO with video footage in a variety of contexts over the past 10 years ranging from Levine, Taylor, and Best's (2011) study using SSO to examine aggressive incidents captured on CCTV in relation to escalatory and de-escalatory (conciliatory) behaviors of third parties, to Sytsma, Chillar, and Piza's (2021) study using BWCs to examine police use of force—as detailed in the following section.

Body-Worn Cameras

As of 2016, 47% of U.S. law enforcement agencies had acquired BWCs (Hyland, 2018) and the number has likely grown in recent years. Not surprisingly, researchers have used a number of methodologies (e.g., surveys, observations, and randomized control trials) to assess the impact of BWCs on a variety of police activities including: how BWCs influence interactions between officers and community members, officer

post-event memory (Blaskovits & Bennell, 2020), officer-initiated (proactive) activities (Lawrence & Peterson, 2020), perceptions of accountability and productivity (Fallik et al., 2020), community member complaints against officers (Ariel, 2016; Ariel et al., 2017; Braga, Coldren, Sousa, Rodriquez, & Apler, 2017; Goetschel & Paha, 2017Goetschel & Peha, 2017; Police Executive Research Forum, 2017), assaults against officers (Ariel et al., 2018), rates of arrest (Ariel, 2016), and police use of force (Ariel et al., 2015; Braga et al., 2017; Culhane, Boman, & Schweitzer, 2016; Mangels et al., 2020). Interestingly, however, while most of these inquires have centered around the use of BWCs, much of the data used *to assess the impact of BWCs* draws on official police records and through police or community member surveys, rather than from the videos themselves.[fn1] In the following, we offer a review of the studies identified as most relevant to the present study in relation to coding videos and using such data to assess police use of force behavior.

Willits and Makin (2018) analyzed 95 use-of-force incidents depicted in BWC footage with a focus on physical force. Seeking to extend prior research and drawing on a force continuum approach as detailed by Terrill (2003, 2005), they sought to assess when and under what circumstances (e.g., suspect characteristics, disposition, and behaviors) force occurred. They also stressed the importance of examining the context surrounding use of force, including lower level force, when considering the relationship to suspect resistance. A key focus of the study was the length of time it took for force to occur, the amount of time force lasted, and the type of force used. They found officers took longer to apply force when dealing with resistant suspects, although when suspects did resist, officers applied force for significantly longer times compared to non-resistant suspects. Officers were also slower to apply force on white and female suspects. Additionally, officers used more force when interacting with male suspects, and force tended to be greater when applied later in the encounter.

While the authors noted the advantages of using BWC footage (e.g., objective third party observing without risk of influencing behaviors), an important element of the study was a greater illumination of the challenges of coding videos. For instance, they noted the difficulty and time requirements needed. And while they recommended researchers follow a pre-defined codebook, they found it necessary to adjust their codes and define new codes to better fit the force behaviors observed in the videos. For example, they planned to code when officers pushed suspects, but realized a distinction between controlled and uncontrolled pushes was necessary to account for pushes to effect restraint and pushes not intended for restraint. This demonstrates the importance of remaining flexible when coding to ensure capturing unexpected or undefined activities. Finally, they also noted that BWC only offers a single perspective of events.

More recently, Makin et al. (2021, *p*. 167) proposed combining SSO with event modeling, defined as "an effort to interpret real-life events accurately through the deconstruction of observed underlying heterogenous events" to code BWC footage.[fn2] As opposed to live in-person observation with no opportunity to review or capture missed activities, using BWC allows observers to repeatedly watch the footage. They argued that such a methodology provides researchers the opportunity to best contextualize events by

capturing dynamic interactions as situations unfold while accounting for situational factors. They further explained the importance of determining start and end times, such as the start/end of the interaction between officer and suspect.

Finally, Sytsma, et al., (2021) used SSO to code BWC footage across 91 use-of-force events from the Newark, New Jersey Police Department. They focused on identifying force escalation scripts (i.e., "dominant configurations of choice structuring properties") through the use of conjunctive analysis (i.e., "multivariate technique for the analysis of categorical variables which allows for the establishment of causal relationships") (pgs. 2–3). They identified dominant configurations of pre-identified officer action points, suspect action points, and environmental characteristics. Analysis revealed that configurations in which officers used shouting commands had the highest risk of escalation. In encounters with the lowest risk of escalation, officers more often used calm commands, provided reasons for the interactions, and explained to suspects why they were detained. Risk of escalation increased when suspects exhibited signs of drug or alcohol impairment. In addition, the authors found that the risk of escalation was greater when incidents occurred outdoors in public spaces and when suspects and officers were nonwhite and male.

Study Background

In 2018, the Federal Law Enforcement Training Centers (FLETC) hosted a Psychology Consortium titled "Critical Thinking in Law Enforcement: Adapting to a Changing Environment." The event is a bi-annual showcase of social science research and scholarly knowledge presented by members of the academic and law enforcement communities. A primary goal of the consortiums is to expose the law enforcement training community to current theories and findings from the behavioral sciences in an effort to expand the training knowledge base and provide practitioners with empirically sound tools to protect the homeland. Additionally, researchers have the opportunity to receive feedback from a practitioner's perspective, which is valuable for identifying practical applications of the findings and shaping new research. Such collaboration between law enforcement and academia is a vital component in providing effective training that advances policing in the 21st century.

Shortly following the consortium, researchers from FLETC and Arizona State University began to discuss how Terrill's (2001, 2003, 2005) Resistance Force Comparative Scale (RFCS), in tandem with employing a SSO methodology, could be used with dashboard and BWCs video footage to capture the developmental nature of police-suspect encounters and tap into de-escalation and escalation. A key focus was to determine if the original coding model could be extended to include not only additional types of suspect resistance and police use of force but also a wider range of suspect "mediator" variables (e.g., emotionality, hostility, and self-preservation) and police "mediator" variables (e.g., accusatory statements, derogatory language, and displays of compassion and empathy). If so, such an approach could prove fruitful for subsequently assessing how these factors alter an encounter in relation to de-escalation and escalation (or both).

After consulting the literature and finding little prior research had been done within this space (i.e., using video data in combination with SSO and the RFCS to code and analyze force encounters), it became apparent rather quickly this was an area ripe for greater inquiry. The U.S. Department of Homeland Security subsequently funded the *De-Escalation Behaviors in Naturalistic Law Enforcement Setting Study*, which would involve viewing and coding, and subsequently analyzing, over 400 dashcam and BWC videos from two police agencies, with the overall aim to produce findings that may inform training for local, state, and federal law enforcement.[fn3] An important first step, however, and focus of the present inquiry, is detailing the methodological process used and lessons learned from this study in relation to the benefits and challenges of using video data. The purpose is to lay out a research process that uses video data and incorporates a SSO coding methodology and the RFCS evaluative framework to better understand police use of force behavior (e.g., de-escalation and escalation). Hence, similar to the small, but growing literature in this area (i.e., Makin et al., 2021; Sytsma et al., 2021), we offer a systematic methodology for coding and analyzing video data that can help answer important use of force research questions in the future.

De-Escalation Behaviors in Naturalistic Law Enforcement Setting Study

We begin by illustrating the importance of carefully training researchers on SSO within the framework of observing police-suspect events using video data. Relatedly, we emphasize the need to identify and define police-suspects interactions at the encounter level, while also embedding individual sequences to ensure proper temporal accounting so researchers can conduct causal analysis. We then note the steps taken in relation to having multiple observers view and code each video. Following this, we illustrate how prior work using the RFCS to assess police use of force patterns can also be used with video data. Finally, based on the experiences learned from the study we detail the benefits and challenges of using videos. While the following sections offer a detailed accounting of these processes and outcomes, please see Tables 1 and 2 for brief summaries highlighting the main issues.

Preparation and Training

Not surprising to those who have previously used SSO, the importance of preparation and training when engaging with the methodology cannot be understated. It short, it is hard work, time consuming, and requires a high level of commitment and expertise. While it may be tempting to "jump right in" to coding videos once researchers have access (and thus no need to go out into the field to conduct observations via traditional in-person ridealongs), many of the steps outlined by Mastrofski et al. (1998) are still applicable such as training observers; specifying who, where, when, and what to observe; and ensuring proper supervision and monitoring. As such, it is vitally important to create a well-defined coding protocol and for observers to practice watching videos and engaging with the codebook to best determine what works, and what does not, before actually starting to code in earnest.

Table 1. Summary of Coding Process.

Category	Steps	Actions
Preparation and training	Coding parameters	Specify who, where, when and what to observe
	Oversight	Establish supervision and monitoring plan
	Coding protocol	Define in detail the behaviors that should be coded
	Practice	Watch videos and use codebook prior to actual coding; modify as needed
Coding structure	Unit of analysis	Select and define primary unit of analysis (e.g., police-suspect encounter)
	Variable levels	Consider and define encounter-level and sequence-level variables
Consistency checks	Monitoring	Continually monitor and discuss coding challenges and issues
	Reliability	Determine number of videos to double code (e.g., 20% vs. 100%)
Evaluate interactions	Framework	Select framework for measuring, modeling, and evaluating police practice (e.g., RFCS)
	Temporal order	Account for ebb and flow of police and suspect behavior throughout encounter
	Practical concerns	Consider policing activities dictated by use of authority, safety concerns, and policy (e.g., sliding scale)

Within this context, preparation and training for the project occurred over a 6-week period (May-June 2020). Along with analytically considering the varying forms of behavior that should be captured and coded, the research team spent this period practicing coding videos to get a better sense of the potential benefits and challenges of capturing a host of varying behaviors. It quickly became apparent that the challenges of coding videos were ever present (we expand on the coding challenges in last section of the article below). By the end of the training period the research team (consisting of three observers/coders and the principal investigator) had collectively spent 480 hours coding 30 videos. After 19 iterations, the end result was a 24-page codebook consisting of 62 different variables. While detailing all of the measures within this space is not possible, in the following we outline some of the key elements captured along with some examples for potential future researchers to get a sense of the important measures and specificity needed to guide observers/coders.

Coding Structure and Variables

Similar to prior SSO work (Reiss, 1971; Terrill, 2005), the police-suspect encounter served as the primary unit of analysis and was defined as a face-to-face communication between the police and a suspect. A number of variables were coded at the encounter

Table 2. Merits and Challenges of Using Video Footage.

Coding Component	Consideration
Dashcam	Positive: Wide view of events, ability to observe the officer
	Negative: Events occur outside camera view, difficult to determine suspect age and race when out of view
Bodycam	Positive: Better representation of officer's point of view
	Negative: Camera does not move with officer's head, cannot track officer's body language or facial expressions
Audio	Positive: Records verbal interactions when people are out of view
	Negative: Ambient noise, multiple voices that make it difficult to identify who is talking
Missing information	Comprehension level even with gaps in video or audio
	Events that occur prior to or after video recording
Event factors	Encounter beginning and end points
	Multi-person encounters when activities occur off screen
Coding scheme	Continuity of resistance-force sequences between coders
	Parameters used to designate a sequence beginning and end
	Process to identify and adjust factors and coding parameters based on observations
	Actions (e.g., handcuffing) that occur separately from decisions (e.g., to arrest)

level (i.e., those that would remain constant throughout the encounter). Some examples included suspect race, gender, and age, as well as numerous situational factors such as whether the encounter was proactive or reactive, if there was a prior indication of potential violence, if the police knew of the suspect or location prior, time (i.e., night vs. day), and the location where the encounter occurred.

Within each encounter, observers also coded sequences, which were anchored by any occurrence of suspect resistance, police force, both, or none. The codebook explicitly defined each form of resistance (e.g., passive, verbal, and defensive physical) and force (e.g., command, threats, and soft hands). In essence, a sequence paired a suspect's resistance (or lack thereof) with an officer's use of force (or lack thereof). For example, if an officer saw a suspicious person walking in a park and commanded him to stop, and the suspect stopped and complied, one sequence was coded as no resistance paired with a command. If an encounter had multiple uses of resistance or force, additional sequences were coded.

Within each sequence observers also captured a series of suspect and officer mediator/predicator variables (i.e., those actions that could vary throughout the encounter). Capturing sequence level behaviors is particularly important for proper temporal ordering and causal modeling. Examples of sequence variables included suspect tenor (e.g., demeanor), signs of impairment (e.g., drugs, alcohol, and mental), evidence of illegality (e.g., confession, observation, and circumstantial), emotional state, and the presence of a

weapon or warrant. For officers, examples included items such as tenor, use of noncoercive tactics (e.g., asking, suggesting, or persuading), accusatory or interrogation type tactics, and whether there were multiple officers present.

While some measures were fairly straightforward and easy to code, requiring little explanation for observers, others required more explicit definitions, along with informational and behavioral indicators. A good illustrative example was tenor, as this was a variable that could be highly subjective, and thus observers needed as much specificity as possible. The following lays out the explicit guidance provided on suspect tenor within the codebook:

> Tenor is "the general meaning, character, or pattern of something." For this measure, apply tenor is terms of the tone taken by the suspect.
>
> Code 1 (positive) if the suspect sets a positive tone when interacting with the police by
>
> displaying civility or tolerance. Acquiescing (i.e., acknowledging some degree of responsibility) or showing deference (i.e., demonstrating regard for the officer's position) toward the police or situation would also qualify here. Example: Suspect apologizes for behavior, pleas for leniency, asks for help or advice, tells the officer he understands why the officer stopped him (i.e., you're just doing your job), uses polite words (sir/ma'am, please/thank you) or a friendly tone-of-voice.
>
> Code 2 (neutral) if the suspect displays a neutral disposition or tone when interacting with the police, by taking a "matter-of-fact" or even-keeled type approach. Example: A routine traffic stop where an officer asks for the suspect's driver license and the suspect provides it without a negative or positive comment (or makes no comment), the officer issues a ticket and the suspect accepts it without any negative or positive comments (or comment), and then departs the scene. Note: Simply asking an officer questions without a judgmental tone would generally be coded here as 2 for neutral (e.g., suspect asks an officer why he stopped him).
>
> Code 3 (negative) if the suspect sets a negative tone when interacting with the police by displaying incivility or intolerance. Failing to acquiesce (i.e., not acknowledging some degree of responsibility) or show deference (i.e., demonstrating regard for the officer's position) toward the police or situation would also qualify here. Example: Suspect argues he did nothing wrong, tells the officer he got the wrong guy, tells the officer the reason for the stop was improper, makes negative comments about the police, uses overt sarcasm or condescending tone of voice, makes disparaging or belittling remarks, slurs (racial, sexual, lifestyle), uses obscene gestures, spits in the presence of an officer (even if not in the direction of the officer).
>
> Code 4 (positive and negative) if the suspect engages in behavior that can be characterized as both codes 1 and 2. Example: Suspect curses at the police, but then apologizes and pleas for leniency. Note: Overall, this measure is not necessarily about the reality of guilt or nonguilt, but the manner in how the suspect presents to the officer.

Final Count and Consistency Checks

Over the course of 8 months (July 2020–February 2021) the research team viewed 530 videos and used 438 of them to code 540 police-suspect encounters within Atlas.ti and SPSS software.[fn4] 92 of the videos were not coded for a variety of reasons including insufficient video/audio, no suspect, language barriers, and so forth.[fn5] Throughout the coding process the researchers met regularly (every 1 to 2 weeks generally) to discuss any coding challenges or issues that arose.

While the original plan after completing the initial coding was to draw a sample of cases to conduct consistency checks (i.e., have a second observer view the videos to concur or dispute the coding decisions of the initial observer), there was consensus from the research team that all videos should be checked given the challenge and level of nuance involved in coding the videos. As a result, the team pivoted and conducted a 100% consistency check rather than just a sample. In cases where the second observer's assessment differed from the first observer's, a third observer viewed the video and served as the tie-breaker for the final coding decision.[fn6] To place into context the enormous time commitment devoted to the full coding process, each of the three observers worked roughly 20 hours per week (naturally some weeks a little more and some a little less). Across 8-months, this computed to nearly 2000 hours.

Evaluating Escalation and De-Escalation

Once the data are coded, one can begin to assess patterns of force behavior. While an impressive amount of research from a variety of angles in terms of escalation and de-escalation has recently been undertaken (Engel et al., 2020; Giacomantonio, et al., 2019; McLean et al., 2020; Todak & James, 2018; Wolfe et al., 2020.), and there are a number of ways to characterize such within police-suspect encounters using video data (Makin et al., 2021; Sytsma et al., 2021), an important component is to consider the amount of resistance posed by a suspect and the subsequent amount of police use of force used in response. To do so require baseline scaling for which resistance and force can be assessed. As illustrated by Terrill (2001, 2003, 2005), along with colleagues (Terrill, Alpert, Smith, & Dunham, 2003), the RFCS can serve as a valuable tool to account for suspect resistance and police use of force as a means to gauge the ebb and flow of behavior (via sequences) throughout each encounter and account for instances when officers use less force, more force, or a commensurate level of force relative to the level of resistance faced.

The RFCS draws on the concept of a force continuum. As stated by McLaughlin, "[a] force continuum is a guideline representing the appropriate amount of force that should be utilized by a law enforcement officer in generic situations. It should provide a means for escalating force when the subject shows noncompliance and a means for de-escalating force when the subject complies" (1992, *p*. 65). Despite anecdotal accounts of the demise of resistance/force continua (Aveni, 2003; Peters & Brave, 2006; Petrowski, 2002; Williams, 2002), Terrill and Paoline (2012) found

that such a policy framework was used by over 80% of police agencies (what the percentage is now 10 years later is unknown though). Moreover, agencies relying on a more restrictive policy approach reap the benefit of less coercive police behavior as found by Terrill and Paoline (2017). Thus, the RFCS is a framework that constitutes a viable standard against which police practice may be measured, modeled, and evaluated.

Figure 1 depicts a modified version of Terrill's (2001) original RFCS, which can easily be used with video data (and for which the present authors will draw on as the next step in the project). As shown in the figure, the upper two columns rank, in terms of severity, resistance and force levels. The columns in the lower half of the figure show the evaluative category for each police response given the level of resistance. Using this framework, one determines whether officers used less force (i.e., de-escalated), commensurate force, or more force (i.e., escalated) *for each sequence*. Upon determining the outcome of each sequence, the entire string of sequences is examined and a determination made per the overall outcome.

Note that the basic coding structure is nothing more than a means to help identify instances when it appears officer force is not commensurate—according to the criteria of the continuum—with suspect resistance.[fn7] In addition to considering the level of resistance and force used, it is important to account for at least three additional factors in the coding process within sequences. Specifically, if officers learn a suspect has a warrant, believe the suspect has a weapon, and/or is in the process of making an arrest, what is considered commensurate force should be adjusted to include force levels up through cuffing (even if the suspect was not resistant or displayed non-physical resistance).

Further, it is important to note that we advocate that a *sliding* scale should be applied (as per the basic analytic coding scheme) within encounters from one sequence to the next. For instance, if a resistant suspect continues the same level of resistance in consecutive sequences, commensurate force should be coded at the next highest level.[fn8] For example, if a suspect verbally resists and the officer responds with a command, and then the suspect again verbally resists and the officer responds with a firm grip, this should be coded as commensurate force. Without a sliding scale the force used in the second sequence (i.e., firm grip) would be coded as more force (e.g., escalation). Moreover, extension of a sliding scale should also be applied to suspects who are arrested. For example, if a suspect is cuffed in the first sequence, and in the second sequence the officer leads the non-resistant suspect to the car with a firm grip, this should be coded as commensurate force. Conversely, if a resistant suspect continues the same level of resistance in consecutive sequences and the officer responds with the same level of force, this should be coded as less force as the officer could have used a higher form of force. For example, if a suspect verbally resists and the officer responds with a command, and the suspect again verbally resists and the officer again responds with a command, this should be coded as less force (e.g., de-escalation). Without a sliding scale the force in the second sequence (i.e., command) would be coded as commensurate force.

Levels of Suspect Resistance	Levels of Police Force
1-No Resistance	1-No Force
2-Passive	2-Command
3-Verbal	3-Threat
4-Threat (Physical)	4-Pat Down
5-Evasive	5-Firm Grip
6-Defensive Physical	6-Cuff
7-Aggressive Physical	7-Pain Compliance
	8-Takedown
	9-OC Spray
	10-Non-Weapon Strike (e.g., hands)
	11-Weapon Strike (e.g., baton)
	12-K9
	13-Taser

Resistance	Less Force	Commensurate Force	More Force
1	--------	1,2	3+
2,3,4	1	2,3	4+
5,6	1,2,3	4,5,6,7	8+
7	1,2,3,4,5,6,7	8+	--------

Figure 1. Resistance Force Comparative Scheme (RFCS).

By methodically viewing and coding in this manner, one now has a dependent variable for which the temporal nature of suspect resistance and police use of force, along with key situational dynamics encountered (e.g., suspect has a weapon, warrant, or is being arrested), has been accounted. At this stage, any number of research questions may be posed and tested. For the FLETC study, this will revolve around attempting to answer the following questions: (1) What are the characteristics of suspect resistance and officer force patterns over the duration of encounters? (2) What factors, if any, decrease/increase police use of force? (3) What factors, if any, decrease/increase suspect resistance?[fn9]

Finally, use of the terms less and more force should be understood strictly in terms of the evaluative criteria. Less force simply means that the officer used less force according to the RFCS in any given instance, while more force refers to the use of more force according to the RFCS. For instance, there can be cases where in one encounter an officer uses a firm grip that is considered less force (e.g., when a suspect attacked an officer), while in another an officer uses a firm grip that is considered more force (e.g., when a suspect was nonresistant).

Merits and Challenges of Using Video Footage

Video challenges. As mentioned by previous researchers, and found by us as well, one drawback of using dashcam and BWC footage rather than live observation is the

inability to capture information outside the camera's field of view (Willits & Makin, 2018). Live observers can direct their attention to important events, and while BWCs move with officers, dashcams remain fixed regardless of where the action is located. Officers have the option of angling their dashcams to one side, but once they leave the vehicle that is where the camera stays. When interactions took place directly in front of the dashcams, they captured a broader view of events compared to BWCs and had the advantage of showing the primary officers, who were hidden in the BWC footage.

Coding dashcam footage was far more difficult when the interaction took place outside camera view. This was occasionally overcome to some degree by the audio recording. While the dashcams remained in one spot, microphones were attached to the officers and thus followed them off screen. Often, observers could infer visual information from the audio. For example, an observer hears, but cannot see, an officer telling a suspect to put his hands behind his back and then hears handcuffs closing, the observer could reasonably code the handcuffing. However, s/he could not code a firm grip or pat down without some auditory indicators (e.g., command to spread legs and questions about items), although these might reasonably be assumed. In many videos, officers would walk suspects back into camera view to do pat downs and searches, which would confirm the off-camera handcuffing.

Another challenge that occurred with dashcams more so than with BWCs was in coding suspect race and age. At times, the suspect did not get out of the car during traffic stops and some calls took place inside homes or businesses. This meant researchers could not determine age and race through observation. Unless the suspect or officer mentioned a date of birth or ethnicity, the researcher could not code these variables.

BWCs offered a view of scenes that more closely mimicked an officer's point of view, for instance by going wherever officers went, including inside buildings. However, observers were reliant on the officers wearing BWCs. If cameras were deactivated, observers would miss a portion of the interaction. Further, although the BWCs allowed access to a lot of areas, it mattered the direction the officer was facing. For example, in some cases the officer wearing the BWC would leave the suspect with a backup officer to go back to the patrol car to confirm the suspect's identification. The observer would then only hear and see the officer inside the vehicle with no idea what was going on with the suspect and backup officer.

In our sample, officers wore their BWCs mid-chest or near their shoulders resulting in limited views when their arms were raised (e.g., when pointing a weapon), when they were in close proximity to a person (e.g., during a pat down), or their faces pointed down (particularly with beards). Because the BWCs were mounted on their chests, the cameras did not move with officers' heads, leading to missed information such as when officers were speaking with someone to the side or reacting to events occurring off camera. This was particularly problematic when multiple suspects or officers were on scene making it difficult to discern with whom the officer was interacting.

Finally, another disadvantage with BWCs was that observers could not track where officers were looking or their facial expressions and body language. If a researcher is interested in these factors, they should not rely on BWC footage as their source of data.

We were sometimes able to gather additional information though from the BWCs of other officers at the same scene, which allowed for more accurate coding.

Audio challenges. Similar audio challenges arose for BWCs and dashcams. While both worked well at capturing verbal interactions, that meant they also picked up ambient noise, such as wind and passing traffic, which could drown out conversations. While this was not an overly problematic issue, there were some occasions when entire videos were difficult to listen to due to high winds or passing vehicles. In addition to road traffic, issues such as inclement weather, nearby construction, dogs barking, and multiple people talking at once made it difficult to hear and sometimes led to the loss of information.

We created two variables to address audio and video challenges. One variable asked the observers to indicate if any of the video/audio cut off during the encounter, if the officer/suspect was out of sight/sound, or if there was difficulty hearing/understanding what was being said or done. The second variable asked observers to rate their confidence (0–100 percent) that they understood what was going on in the encounter given any missing video/audio content. This allowed for a subjective assessment of comprehension even if some information was missing. If the video/audio posed too difficult a challenge to comprehend, the video was removed from the analysis.

Event factors. The events depicted in the encounters brought up certain coding challenges. One challenge was in determining the encounter end and duration. The research team discussed at great length when to end each encounter. Several considerations made this decision challenging, such as whether the suspect could influence escalation/de-escalation after being handcuffed and how long after the officer broke contact with the suspect (e.g., when placed in the patrol car) should observers continue coding. While the final decision was to end encounters when the primary officer physically left the scene, this did not always provide the best representation of events. For example, an officer might pull a suspect over, find drugs in the vehicle, arrest the driver, and place him/her in the back of the squad car within 10 minutes. However, the officer may not leave the scene for another half hour while searching the car or waiting on a tow truck. Therefore, some encounters appear as though they went on far longer than the interaction with the suspect.

Another event factor that proved difficult was the presence of multiple officers, suspects, and other community members. One variable that could influence police-suspect interactions was the number of other people on scene (Levine, et al., 2011). In most cases, it was easy to code the number of community members and officers at the scene. However, in a handful of encounters too many community members were present to get an accurate count based on the available video/audio footage. This was especially the case when the interaction took place inside businesses (e.g., restaurant, gas station, medical facility).

Observer comprehension was also impacted when the primary officer had to interact with multiple suspects and officers, sometimes simultaneously. When multiple suspects

were standing in a group or were in a vehicle, it was difficult to ascertain which officer was talking to which suspect. During some encounters, secondary officers and additional suspects were speaking within earshot of the primary officer's microphone, making it difficult to distinguish between conversations.

Another challenge was when officers separated suspects in such a way they ended up off camera. On occasion, the observer was unable to match each voice to each suspect. For example, if an officer issued different commands to different suspects, it was difficult to know which commands were directed toward which suspects. This required the observer to review the video multiple times to look for cues to match commands to suspects.

Events sometimes also started prior to the primary officer's arrival leading to challenges deciphering what had transpired prior to the officer's arrival, for instance, when the suspect was already out of her/his car or in cuffs. This sometimes occurred on the back end of encounters as well, such as when an officer's video/audio cut out before the encounter had concluded. This left the observer unable to assess whether additional force was used or whether the suspect was arrested or released.

Coding scheme challenges. We also encountered several challenges associated with creating and streamlining the coding scheme. The primary challenge was in identifying resistance-force sequences with adequate continuity. To do this took a combination of both formal rules and discretion in an attempt to provide an accurate representation of what occurred. For example, some of the DUI encounters involved lengthy sobriety tests that involved many commands. Rather than creating a sequence for every command, these were combined into one sequence with an additional force repeat code. Observers used repeat codes if multiple forms of resistance and/or force were used within a sequence where the highest form of resistance and/or force was already coded. Additional resistance and force variables could be the same resistance/force and/or another equal or lower level resistance/force. If a higher level of resistance or force occurred, it would initiate a new sequence. By using repeat codes, we were able to capture all instances of resistance and force without creating an onerous amount of small sequences with little informational value.

Another issue in creating sequences was in distinguishing when a sequence should end versus continuing and being elevated to a higher resistance/force level. For example, in some DUI stops an officer would move to cuff a subject only seconds after issuing their last sobriety test command. In trying to provide a good representation of events, this was separated into two sequences. The first being the sobriety test commands, and the second being the use of cuffs. In other types of interactions though, an officer who used a command right (e.g., "put your hands behind your back") within the context of cuffing would be treated as a single sequence. We considered this one sequence because there was no break in continuity.

Identifying sequences was even more challenging in quickly evolving situations. When officers were dealing with resisting suspects, they could issue multiple commands and threats making it difficult to know when to properly start or end sequences.

In such cases, it was possible that observers missed contextual cues or even resistance/force sequences.

Several factors associated with successful de-escalation (e.g., Todak & James, 2018) were not readily observable, and thus required careful definition for coding. Many of these factors have been coded in observational studies, but as discussed above, an advantage of video is the ability to view the situations multiple times to capture nuances and objectively state what was observed in detail. In addition to tenor (described in detail above), coding commands proved more difficult than expected. While reviewing the videos, the researchers realized that while officers sometimes issued straightforward commands, at other times there is nuance between a command, request, or suggestion. Officers have their own mannerisms, and this sometimes made it difficult to discern whether they were issuing commands or using suggestive noncoercive tactics. This was especially the case with many minor movement control-oriented commands. Sometimes officers would give what at first sounded like a command, but it would be couched in a word or two that made it technically noncoercive. For example, an officer says, "Would you mind coming over here and standing while I check for warrants?" Further, while the observers made a continual effort to distinguish between a command and a request, the difference was often quite subtle. For instance, "Could you stay in your car for now" was not coded as a command, while "Stay in the car" was coded as a command.

Suspect emotionality also needed some distinction beyond simply whether s/he was emotional. For instance, at times suspects were emotional, but it was not directed at the officers (e.g., yelling about something that happened to them or crying). This type of emotionality, although not directed at the officers, might impact their response and thus was coded as a potential predictor. We also accounted for the intensity of emotion, such as showing mild anger versus cursing loudly and repeatedly. In addition, sometimes suspects were having a conflict with another person rather than the officer (with or without any emotion), thus this was coded separately as part of a conflict variable.

Finally, another factor that presented a challenge was coding for arrests. While determining whether a suspect was arrested was fairly easy (although not always), the challenge was in trying to discern when the actual arrest decision occurred. Sometimes officers put cuffs on a suspect for security reasons, but then later decided the suspect was under arrest. This occurred, for instance, when officers searched a car while the suspect sat cuffed on the side of the road. An officer might find drugs or a weapon off camera and then decide to arrest the suspect once the search of the vehicle was complete. It would not be until the officer informed the suspect of the arrest that the researcher found out the officer had made an arrest decision. Other times, it was only after a backup officer arrived that the researcher learned the suspect was under arrest. As a result, it was important to watch the entire video to ensure the researcher captured all the relevant information.

Concluding Comments

It is our hope that future researchers find value in the proposed methodological approach detailed and our shared experiences in relation to the benefits and challenges of

using video data. We anticipate that as more researchers gain access to videos there will be improved and more novel ways to consider how best to code and analyze the data in an attempt to help answer important police use of force research questions. Our main caution is not to take such a process lightly, as it may be more challenging than originally thought. Within this vein, we repeat what we noted earlier. That is, although video data may be rich in content and provide many opportunities, researchers must be especially mindful to scope their research questions, and importantly methodological approaches, with careful consideration of the time, labor, and expertise required to code and subsequently analyze such data.

Further, as noted by Terrill (2005) years ago but worth repeating here, the RFCS is by no means the only standard by which police use of force (or assessing escalation and de-escalation) should be measured and analyzed. Further, legitimate exceptions may well occur with sufficient frequency as to reduce the capacity of such an approach. For example, under what circumstances should officers actually use more force than what would appear to be proportional or incremental? Relatedly, it is certainly plausible that a number of cases coded as commensurate force may actually be conceived as being a form of escalation or de-escalation upon an altered scaling metric. For example, the RFCS considers a police verbal command or threat as commensurate in response to a suspect presenting passive or verbal resistance. Yet, an argument can be made that an officer responding with a command when faced with verbal resistance should be coded as less or de-escalated force.

In conclusion, the methodological rigor of SSO combined with the comparative scheme offered with the RFCS (or an alternative scaling approach) provide a useful roadmap for capturing and coding the complex and often subtle components of police-suspect interactions. Our efforts to account for potential factors associated with escalation and de-escalation required the research team to carefully consider verbal and physical behaviors outside typical use-of-force actions, such as tenor, the nuanced forms of police commands, and suspect emotionality. This allowed us to code nuanced resistance and force patterns while accounting for a wide variety of behavioral, situational, and environmental factors. Because the coding effort was systematic and comprehensive, we anticipate being able to provide a variety of insights about suspect and police actions, but with the depth afforded by using video to gather the data.

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Notes

1. See Lum, Stolz, Koper, and Scherer (2019) as they provide a comprehensive review and summary of BWC research; see Nix, Todak, and Tregle (2020) as they examine the diffusion of BWCs throughout out the U.S.
2. Scherp and Mezaris (2014, *p*. 1) note six distinct aspects of event modeling: time, space, participation, relations between events, documentation, and interpretation.
3. One being a large midwestern/southern municipal department (equipped with BWC) and one being a midwestern/southern semi-rural sheriff agency (equipped with dashcam).
4. When more than one officer was involved in an encounter, the collective actions of the officers on scene were coded not just the one officer (e.g., the one with the dashboard camera or BWC).
5. Additionally, of the 438 videos used to code, 22 were duplicate videos of the same incident from another officer. When this occurred, all videos were used to code.
6. Importantly, even with the consistency check system used, others may view the video footage and come to a different conclusion given the subjectivity of assessing some behaviors.
7. Use of the term commensurate force, as well as the use of more or less force, does not denote any judgment in terms of legality. Commensurate force simply signifies whether it fell within the confines of the scaling metric RFCS.
8. Our reasoning for advocating a sliding scale falls within the realm that force should not only be proportional, but also incremental as argued in prior work (see Terrill, Alpert, Dunham and Smith; Terrill, 2005). Failure to permit officers to increase force when faced with repeated resistance places officers in the difficult position of using a level of force that already did not work once. Nonetheless, a counter argument is that perhaps officers should attempt repeated force at the same level before escalating. Future researchers can apply the approach they believe is best warranted as the scaling is flexible.
9. Just as it was important to ensure temporal ordering with coding the dependent variable, it is also important to ensure any independent variables are properly accounted for prior any predictive statistical modeling.

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