

How Suspect Race Affects Police Use of Force in an Interaction Over Time

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Although studies often find racial disparities in policing outcomes, less is known about how suspect race biases police interactions as they unfold. This study examines what is differentially occurring during police–suspect interactions for White, Black, and Latino suspects across time. It is hypothesized that racial bias may be more evident earlier in interactions, when less information about the situation is available. One hundred thirty-nine (62 White, 42 Black, and 35 Latino) use-of-force case files and associated written narratives from a medium to large size urban police department in the United States were analyzed. Trained coders broke down the interaction narratives into discrete “sequences,” or dyadic action–reaction steps involving a suspect action (level of resistance) and an officer response (level of force). A linear mixed-effects model was run on amount of police use of force by suspect race and time, with suspect resistance and suspect actions toward third-party/self as controls. Results demonstrated that Black and Latino suspects receive more force in the beginning stages of the interaction, whereas Whites escalated in level of force faster after initial levels. By breaking down police–suspect interactions into discrete sequences, the current study reveals a better understanding of when bias originates in police use of force and informs how to focus policing interventions.

Keywords: suspect race, police, use of force, racial bias, time

Although not a new phenomenon, recent police shootings of racial minorities—like that of Michael Brown in Ferguson, Missouri, in 2014—have produced increased calls for police reform and reducing racial bias in policing (e.g., Kahn & Martin, 2016). The President’s Task Force on 21st Century Policing (2015) echoed the necessity to improve police trust with racial minorities as one of its central findings. Given heightened racial tensions and the life-or-death consequences involved, understanding and counteracting racial bias in policing is of paramount importance. Although empirical studies have thoroughly investigated racial disparities on policing outcomes, less is known about how suspect race biases police interactions as they unfold. The current study investigates how suspect race influences use of force in police–suspect interactions over time, thereby providing a more nuanced look at how and when bias originates in policing.

Suspect race affects various outcomes in policing and the broader criminal justice system, impacting interactions with police, arrest rates, and criminal sentencing (Kahn & Martin, 2016; Kennedy, 1998; Walker, Spohn, & DeLone, 1996). Racial minorities, and particularly Black males, are often found to have disproportionate contact with the police (Brunson & Miller, 2006; Skogan, 2005), including disproportionate pedestrian stops (Gelman, Fagan, & Kiss, 2007; Ridgeway, 2007) and traffic stops (Cordner,

Williams, & Zuniga, 2000; Novak, 2004). Although results can be mixed (e.g., Engel, Sobol, & Worden, 2000; Garner, Maxwell, & Heraux, 2002), suspect race has been shown to affect the application of force at lethal and nonlethal levels (Fridell & Lim, 2016; Gau, Mosher, & Pratt, 2010; Goff, Lloyd, Geller, Raphael, & Glaser, 2016; D. A. Smith, 1986; Terrill & Mastrofski, 2002; Worden, 1995). Recent efforts to systematically track deadly force and race find similar racial disparities (Gabrielson, Grochowski Jones, & Sagara, 2014; Washington Post, 2016). These observed racial disparities in policing point to the need to better understand the source of these outcomes, whether they be primarily caused by nonracial situational factors (e.g., neighborhood characteristics) or officer racial attitudes (Goff & Kahn, 2012; Kahn & Martin, 2016).

Research on police–suspect interactions provides important insights as to why and how police force is applied. Sykes and Clark’s (1975) deference exchange theory has been used to understand the dynamics of police–suspect interactions. Such interactions are marked by unique characteristics between officers and suspects, including an asymmetrical power difference in favor of the officer and the expectation that citizens defer to police authority. When this deference is not met, police may employ force to reestablish the power dynamic of the relationship. Thus, suspect resistance is often closely tied to the application of force (Alpert & Dunham, 1997). Perceived noncompliance may be exacerbated depending on the race of the suspect and the perceived status of the police officer, which can lead the encounter to escalate in severity (Kaduce & Greenleaf, 2000). Relatedly, perceived threat to the officer, which may also vary by suspect race, is often cited to justify force application (Wallentine, 2009).

The application of police force is often studied using police use-of-force reports (Hickman & Atherley, 2012; Hickman, Atherley, Lowery, & Alpert, 2015; MacDonald, Manz, Alpert, & Dunham, 2003; McLaughlin, 1992; Stewart, 2013; Terrill, 2005; Ter-

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rill & Paoline, 2012). Such reports may include check-box outcomes detailing the level of force employed and/or narrative reports by the officer stating what occurred that led to force application (Terrill, 2001). Although primarily representing the officer perspective, reports go through various layers of review for accuracy (Terrill, 2001). Force can be conceptualized as a dichotomous outcome (application of force vs. not) or a continuum of force, ranging from low to higher levels of force (Alpert & Dunham, 1997; Garner, Schade, Hepburn, & Buchanan, 1995; Terrill, 2003), and can be both verbal and physical in nature (Klinger, 1995). On average, applied force is most often on the lower end of the spectrum (Garner et al., 1995; Klinger, 1995; Terrill, 2003), and deadly force is a rare event (Hickman, Piquero, & Garner, 2008; Terrill, 2001).

Delving into the microprocesses that occur in these interactions reveals important insights into how use of force is deployed. Using this methodology, force encounters are sequenced by coding for officer-force/suspect-resistance dyadic steps within an interaction. That is, each act of suspect resistance is paired with the corresponding officer action to create a step or sequence in the interaction (Hickman & Atherley, 2012; Hickman et al., 2015; Stewart, 2013; Terrill, 2003, 2005). Within these behavioral sequences, there is a necessity of viewing force application in light of suspect resistance throughout the dyadic interaction, as the two are closely interconnected (Alpert & Dunham, 2004; Atherley & Hickman, 2014; Hickman & Atherley, 2012; Hickman et al., 2015; Terrill, 2003). Using this transactional approach, increases in suspect resistance are often found to correspond with increases in police force, and there is also evidence for the opposite directional relationship, with police force leading to increased suspect resistance (Terrill, 2003). Multiple acts of force and suspect resistance can occur at varying levels within an interaction (Hickman & Atherley, 2012; Terrill, 2003, 2005). What occurs early in an encounter often sets the stage for how the remainder of the encounter will play out, such that early applications of force may lead to later increases in officer use of force and/or suspect resistance (Bayley, 1986; Worden, 1995).

Research has yet to examine what occurs differentially at a micro, sequenced interaction level based on suspect race. Social psychological research on how stereotypes and racial bias impact interactions may shed further light on how suspect race may influence police application of force across time in interactions. Within the broader society and in the criminal justice context in particular, Blacks and Latinos are stereotyped as criminals, aggressive, and dangerous (Devine & Baker, 1991; Devine & Elliot, 1995; Madon et al., 2001; Niemann, Jennings, Rozelle, Baxter, & Sullivan, 1994; Unnever & Cullen, 2012). These stereotypes and beliefs may be held at either the explicit and conscious or implicit and subconscious level, thereby not requiring intention to affect behavior (Greenwald & Banaji, 1995; Greenwald, Poehlman, Uhlmann, & Banaji, 2009). Police officers are also aware of and may hold these racial stereotypes, which can influence their interactions with racial minority citizens and decisions to use force (Correll et al., 2007; Eberhardt, Goff, Purdie, & Davies, 2004; Goff, Jackson, Di Leone, Culotta, & DiTomasso, 2014; Plant & Peruche, 2005).

Racial stereotypes are often automatically activated in the perceiver's mind when they encounter an outgroup member, and create expectations in the mind of the perceiver (Devine, 1989; Hilton & von Hippel, 1996; Macrae, Bodenhausen, Milne, &

Jetten, 1994). Once activated, racial stereotypes serve as a lens through which subsequent behavior is interpreted and shape perceptions to be consistent with the stereotype (Banaji & Greenwald, 1995; Hamilton, Sherman, & Ruvolo, 1990; E. R. Smith, Stewart, & Buttram, 1992; Stone, Perry, & Darley, 1997; von Hippel, Sekaquaptewa, & Vargas, 1997). Stereotype application is most powerful under conditions of ambiguity, scarce resources, anxiety, and less information, as they serve to fill in the interpretation of ambiguous actions (Bodenhausen, 1988; Bodenhausen & Wyer, 1985; Fiske, 1998; Hilton & von Hippel, 1996; Wilder, 1993). As many policing encounters might involve these situational characteristics, stereotypes may function similarly with police officers as they interact with a suspect. When police officers first interact with a racial minority suspect, racial group stereotypes may be automatically activated, which can alter the ways in which officers interpret subsequent actions (Hilton & von Hippel, 1996). That is, a police officer interacting with a Black citizen may perceive the individual in light of the criminal stereotype, consciously or unconsciously, which can enhance perceptions of aggression and danger. Thus, their behavior becomes assimilated to the stereotype (Bodenhausen, 1990; Hilton & von Hippel, 1996).

How and when might racial stereotypes affect a police-suspect interaction over time in a sequenced interaction? As suggested by social psychological research, the current study focuses on initial levels of force and the rate of subsequent change or escalation of use of force. When more individuating information is available—specific information about the individual or context—reliance on racial stereotypes can be reduced (Fiske & Neuberg, 1990; Locksley, Borgida, Brekke, & Hepburn, 1980). This process suggests that racial stereotypes might have their strongest impact at the early stages of an interaction, when less information is available and stereotypes have been automatically activated.

Alternatively, it is also possible that officers may explicitly attempt to suppress racial stereotypes upon initially engaging with racial minorities during an encounter. Suppression of stereotypes may be effective initially, but can often produce rebound effects (Follenfant & Ric, 2010; Macrae et al., 1994; Wenzlaff & Wegner, 2000). Rebound effects occur when, after initial suppression of a stereotype, stereotype activation and application becomes even greater than prior to suppression. This pattern might suggest less biased behavior at the start of an interaction as officers are suppressing the stereotype, but predict a greater spike later in accordance with a rebound effect. On the other hand, if police officers do not hold stereotypes or any such biases at either the implicit or explicit levels, race of suspects should have no notable differences on their behavior throughout an interaction. Finally, as predicted by a counterbias perspective, fear of racial bias may ultimately lead to the reverse application of racial stereotypes and less force used against racial minorities compared with Whites (James, Vila, & Daratha, 2013). These alternative hypotheses are also examined in the current study.

Despite extensive research highlighting disparities in use-of-force outcomes by race, less is known about the process through which use of force is applied and how suspect race may influence this application. The current study therefore examines what unfolds differently in police/racial-minority-suspect interactions than police/White-suspect interactions over time. By examining police officer use-of-force case narratives, the use-of-force incident is broken down into discrete sequences. We then analyze how these

incidents unfold over time based on suspect race, focusing on how time affects level of force throughout the interaction and rate of change across time. Drawing from the social psychology literature on stereotyping and implicit bias, it is hypothesized that suspect race will affect use of force earlier in the incidents, such that racial minorities will receive higher levels of force initially compared with Whites.

Method

Use-of-Force Case Files

Use-of-force case files were selected from a sample of 212 available incidents occurring during 2012 from a medium to large metropolitan police department on the West Coast. The cases are drawn from a predominantly White city, with non-White racial minorities making up a smaller percentage of the population. All cases involved at least one officer using force at some point in the interaction, generating the reporting narrative. Cases involving no force were excluded, as no narrative exists in these files. From the available data, we selected cases to include only male suspects (e.g., Paoline & Terrill, 2005; Schuck, 2004) and oversampled racial minority cases to have a sufficient sample to test the study hypotheses. Suspect racial groups that had at least 10 cases during the time period were included for comparison (resulting in the exclusion of Asians and Native Americans). This left White, Black, and Latino suspects as available racial groups to examine, which are representative of the city demographics. Although all cases involved some level of force, selected cases involved only nonlethal force application, as lethal force requires a separate reporting mechanism and procedure outside the access of the study. This included nearly all cases and is consistent with studies of national use-of-force application that demonstrate that the vast majority of police force encounters involve nonlethal force (Terrill, 2001).

We further selected only cases involving crime types in which all racial groups were represented in the larger sample, in order to control for and test possible crime type differences between races. These crime types included simple assault ($n = 66$), disorderly conduct ($n = 24$), drugs ($n = 10$), aggravated assault ($n = 9$), vandalism ($n = 7$), and cases coded as other ($n = 23$), which most often represented interactions concerning warrants, detox holds, or mental health checks. Because we were interested in examining how use of force progresses over time, only cases in which at least two rounds of interaction between the officer and suspect were included. This created a sample of 139 cases for analysis consisting of 62 White, 42 Black, and 35 Latino suspects.

Use-of-Force Narrative Coding

Use-of-force case files were coded into discrete sequences, or dyadic action–reaction steps involving a suspect action (level of resistance) and an officer response (level of force). This dynamic sequencing method has been used to investigate change over time in police–suspect interactions (Atherley & Hickman, 2014; Hickman & Atherley, 2012; Hickman et al., 2015; Terrill, 2003, 2005), and has been validated as reliable by Stewart (2013) and Hickman et al. (2015). Following this methodology, a total of five extensively trained research assistants served as coders of the use-of-

force files. Training consisted of learning police tactics and terminology, reviewing materials, and guided practice with the developed coding scheme. Research assistants averaged 20 hr of instructor-based training. A Use of Force Analysis Codebook, which provided definitions and examples, served as a reference for the coders (see Stewart, 2013, for more information). Coding was done using structured coding sheets that broke down each sequence in the interaction and required research assistants to check the appropriate box for each outcome. Coders rated the following variables in each use-of-force narrative.

Use-of-force sequences/sequence number. For each case, coders read the first-person narratives written by police officers following their use of force in the field. Every discrete interaction between the responding officer and the suspect constituted a single “sequence,” or step in the interaction. Each sequence began with the suspect’s level of resistance to the officer and ended with the officer’s subsequent actions toward the suspect, coded as level of force. For the purpose of determining the sequence of events, a pair of coders would meet and agree on the number of officer and suspect interaction sequences before independently coding each report.

Suspect resistance. Each sequence began with the suspect’s level of resistance toward the responding officer, measured on a 0 (*no resistance; verbal exchange*) to 6 (*use of lethal force*) scale (Hickman et al., 2015; Stewart, 2013). A code of 1 (*verbal/passive resistance*) represented the suspects’ verbal or nonverbal refusal of commands from the officer. A code of 2 (*use of posture and verbal threats*) represented the suspect’s verbal threats or enacting a threatening posture. A code of 3 (*physical noncompliance*) indicated the suspects’ attempts to avoid custody by fleeing, tensing muscles, or pulling away from the responding officer. A code of 4 denoted *active physical resistance*, such as wrestling with or striking the officer, and a code of 5 indicated the *use of a nonlethal weapon*, such as the throwing of a rock or a chair.

Officer actions. This measure indicates the amount of force used by the responding officer during the sequence. These responses were coded on a scale ranging from 0 (*presence; verbal exchange*) to 6 (*use of lethal force*; Hickman et al., 2015; Stewart, 2013). As noted earlier, no lethal force cases were included. *Lawful orders*, such as instructing the suspect to “stop running” or “show me your hands,” were coded as a 1. A code of 2 for *light contact* was associated with the officer touching the suspect in a manner not meant to inflict pain, as when applying handcuffs or escorting the suspect to a police vehicle. The code of 3 denotes a *physical control tactic*. These are actions that are meant to force compliance and may cause injury, such as tackling or pushing a suspect to the ground, using joint manipulations to cause pain, or placing the suspect in a hobble. A code of 4 for *advanced physical; chemical* includes the use of fist, knee, and elbow strikes, as well as pepper spray. The use of nonlethal weapons such as a baton, Taser, canine, or a beanbag gun were coded as a 5 (*intermediate weapon use*).

Suspect actions toward third-party/self. In many use-of-force incidents, the suspect posed a threat to his or her own safety (as during a suicide attempt) or the safety of a third party (a domestic partner or another officer). This variable indexed the suspect’s actions toward a third party or themselves, and not toward the responding officer. These actions were coded on a scale

from 0 (*no resistance; not applicable*) to 6 (*used lethal force/actions*) that is identical to the measure for suspect resistance.

Coding reliability. The dynamic sequencing use-of-force method has previously been validated with police use-of-force case narratives and has been deemed to be reliable (Hickman et al., 2015; Stewart, 2013). Assessing the reliability of the specific study sample, after agreeing on the sequences in the narratives, coders individually rated 50 reports, with each report coded by two coders. Measuring agreement between the raters, Cohen's kappa (κ ; Cohen, 1960) indicated moderate to substantial interrater reliability for the following variables: suspect resistance, $\kappa = .62$, 95% confidence interval [CI] [.53, .72], $p < .001$; officer's actions toward the subject, $\kappa = .78$, 95% CI [.67, .83], $p < .001$; and subject's actions to third-party/self, $\kappa = .54$, 95% CI [.42, .65], $p < .001$. Given the acceptable to high agreeability ratings, particularly on the study variables of interest (e.g., officer actions and suspect resistance), one of the case codes were randomly selected for inclusion in the final data set for analysis.

Results

Descriptive Statistics and Sample Characteristics

Table 1 provides descriptive statistics for the study variables of interest, including maximum level of police use of force, suspect resistance, suspect actions toward third parties or self, and number of sequences. Maximum levels of force were, on average, below the midpoint of the 5-point scale, indicating low to medium levels of force. Level of suspect resistance similarly reflected low to medium levels. Number of sequences ranged from two to 15, with the average number of sequences between six and seven. Suspect actions toward third parties were also on the low end of the spectrum overall. These levels are consistent with past studies on suspect resistance, use of force, and sequencing (Atherley & Hickman, 2014; Hickman & Atherley, 2012; Hickman et al., 2015; Terrill, 2003, 2005).

Testing racial group differences on these variables, ANOVA analyses found no significant differences between suspect race and maximum use of force, $F(2, 135) = .94$, $p = .39$, suspect resistance, $F(2, 135) = .46$, $p = .64$, suspect actions toward third-parties/self, $F(2, 135) = .68$, $p = .51$, and number of sequences,

$F(1, 135) = .33$, $p = .72$. Additionally, no significant differences were evident using multivariate tests for maximum reported levels of use of force, suspect resistance, suspect actions toward third-parties/self, and number of sequences by race, Wilk's $\lambda = .98$, $F(8, 264) = .41$, $p = .92$, nor were differences evident for mean levels among the dependent variables by race, Wilk's $\lambda = .94$, $F(8, 264) = 1.12$, $p = .35$. Thus, in addition to having comparable crimes represented among the racial groups, the sample can be characterized as relatively matched in terms of officer force, suspect resistance, third-party/self actions, and number of sequences in an interaction by suspect race.

Linear Mixed-Effects Modeling

In order to test the study hypothesis regarding how suspect race impacts police use-of-force interactions over time, a linear mixed-effects model was employed. The model examines the main hypothesis as to whether Blacks and Latinos receive more force early on in their interactions with police relative to White suspects. Models were fit using the mixed-effects framework to account for the nested nature of these sequences as well as to accommodate the unbalanced nature of the interaction data. All continuous variables were centered at their respective mean levels. Time (sequence number) was entered as a predictor to model the linear regression in officer actions over the interaction. In addition, time, representing a curvilinear quadratic relationship, was included, as it significantly improved the overall fit of the model ($L\text{Ratio} = 15.85$, degrees of freedom = 3, $p = .001$).¹ Practically, this term was included to capture any noticeable changes, such as possible peaks or relative dips, in the level of force used by an officer during an interaction. Notably, the inclusion of the quadratic term changes the usual interpretation of the linear term, from an index of the expected increase or decrease in force per time step for the entire interaction, to a measure of the rate of increase or decrease at a specific time point along the arc of interactions. For these analyses, we selected the first interaction as the time point of interest; thus, the linear terms represent the rate of change in force expected at the earliest point of the officer–suspect interaction. Theoretically, this instantaneous rate of force increase or decrease should capture the officers' reflexive actions toward the suspect.

Suspect race was dummy coded such that Whites served as the reference group. Therefore, all estimates that include the terms "Black" and "Latino" represent the difference, either an increase or decrease, from the same estimates for Whites as the comparison category. Control variables included the level of suspect resistance and the level of suspect actions toward third-parties/self. Interaction terms were added for the linear and quadratic relationship with time, suspect resistance, and actions toward third-parties/self with suspect race. Additionally, the interaction around time was centered at the first time point, such that estimated racial group differences are relative to the use of force at the beginning of the sequence of interactions. All models were fit using the nlme package in R, and fit using restricted maximum likelihood.

Table 1
Descriptive Statistics by Suspect Race

Variable	Suspect race	Mean	SD	Min	Max
Use of force	White	2.02	1.49	0	5
	Black	1.87	1.35	0	5
	Latino	1.92	1.31	0	5
Suspect resistance	White	1.99	1.36	0	5
	Black	1.98	1.30	0	4
	Latino	2.12	1.22	0	5
Suspect actions toward third-party/self	White	1.73	1.51	0	5
	Black	1.50	1.47	0	4
	Latino	1.92	1.46	0	5
Number of sequences	White	7.02	3.15	2	15
	Black	7.05	3.35	2	14
	Latino	6.23	2.46	2	11

Note. SD = standard deviation; Min = minimum score; Max = maximum score.

¹ Adding a cubic term to time did not improve the model fit, and thus was not added in the final model ($L\text{Ratio} = 6.39$, $df = 3$, $p = .09$).

Table 2

Restricted Maximum Likelihood Estimates for the Final Model of Officer Use of Force

Variables	Value	Std. error	Effect size	Lower limit	Upper limit	df	t value	p value
Intercept	1.26	.13	—	—	—	562	9.56	.000
Time	.40	.06	.50	.38	.62	562	6.57	.000
Time ²	-.02	.01	-.12	-.18	-.06	562	-4.01	.000
Suspect resistance	.16	.07	.14	.02	.27	562	2.27	.023
Suspect actions to third-party/self	.35	.06	.37	.24	.50	562	5.54	.000
Suspect race: Black	.48	.21	.34	.04	.64	135	2.23	.027
Suspect race: Latino	.53	.23	.38	.05	.70	135	2.31	.023
Time × Black	-.30	.11	-.34	-.55	-.13	562	-2.79	.005
Time × Latino	-.43	.13	-.33	-.56	-.10	562	-3.34	.001
Time ² × Black	.02	.01	.10	.00	.21	562	1.97	.049
Time ² × Latino	.04	.02	.22	.08	.37	562	2.96	.003
Suspect Resistance × Black	.22	.11	.20	.00	.40	562	1.95	.051
Suspect Resistance × Latino	.28	.13	.26	.03	.49	562	2.20	.028
Action to Third-Party/Self × Black	-.16	.10	-.17	-.37	.03	562	-1.70	.091
Action to Third-Party/Self × Latino	-.24	.10	-.26	-.48	-.05	562	-2.34	.020

Note. Std. error = standard error; df = degrees of freedom.

Results for the final model of officer use of force over time with relevant covariates are reported in Table 2.² Effect sizes and 95% CIs (lower limit and upper limit) are also reported. The model-based R^2 values were computed based on work from Nakagawa and Schielzeth (2013) and Johnson (2014), and ranged from .37 for the marginal R^2 to .43 for the conditional R^2 . The average between these values represent approximately 40% of the overall variance in office use of force being explained by our reported model.

Figure 1 visually displays the different model-based trajectories of police use of force for Black, Latino, and White suspects over time. Examining the data, the hypothesis that Blacks and Latinos would be subjected to more police force early on in interactions is confirmed. Compared with Whites, Blacks ($\beta = .48$, $SE = .21$, $p = .03$), and Latinos ($\beta = .53$, $SE = .23$, $p = .02$), each received around a half point more force in the beginning of the interaction, controlling for suspect resistance and actions toward third-parties/

self. Given the increase in severity associated with each step on the 5 point use-of-force scale, the half-point increase represents a substantial and meaningful difference.

When examining how the interactions subsequently unfolded over time after the initial force levels, time is a significant predictor of police use of force ($\beta = .40$, $SE = .06$, $p < .001$). This indicates that White suspects were escalating in force as time progressed, receiving just under a half-point increase in force for every additional officer–suspect sequence during their interactions with police. This rate of escalation varied, however, for Blacks and Latinos compared with Whites. As indicated by the Black × Time ($\beta = -.30$, $SE = .11$, $p = .005$) and Latino × Time interactions ($\beta = -.43$, $SE = .13$, $p = .001$), the amount of increase for Black and Latino suspects differed significantly from Whites. Black and Latino suspects experienced less of an increase in force across the interaction, indicating that the escalation of force was not as pronounced for Black and Latino suspects as it was for White suspects when all of the other covariates are taken into account. The greater escalation in force for Whites compared with Blacks and Latinos, however, should be interpreted in light of the significant racial differences in force earlier on. Whites may escalate faster because they start from a lower force level compared with Blacks and Latinos, who do not have as much capacity to subsequently increase as time progresses compared with Whites because of the higher initial starting point in force.

Further examining the use-of-force trajectory over time, the quadratic time effect is significant in the model ($\beta = -.02$, $SE = .01$, $p < .001$), which specifies an initial increase and eventual decline in use-of-force levels as time progresses across interactions for White suspects. As with the linear effect, Blacks ($\beta = .02$, $SE = .01$, $p = .049$) and Latinos ($\beta = .04$, $SE = .02$, $p = .003$)

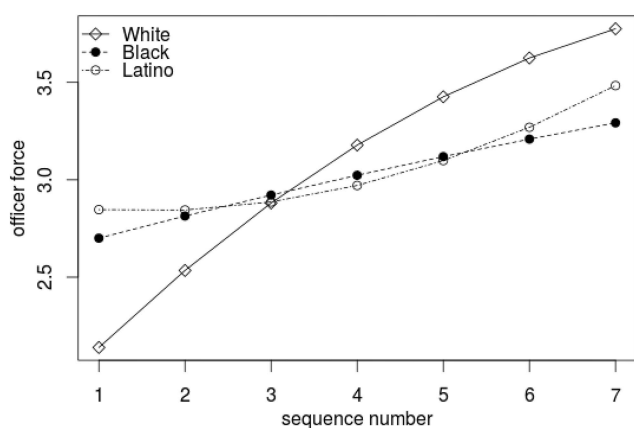


Figure 1. Patterns of racial group averages in use of force across time during police–suspect interactions. Plots are based on the 50th percentile of number of sequences. Early differences in amount of force are apparent, with Blacks and Latinos experiencing higher levels of force on average during the beginning of exchanges with officers. Also illustrated is the appreciable increase in force for White suspects over time, which is significantly higher than for Black and Latino suspects.

² Additional variables were added to the model to see if the overall model fit was improved using likelihood ratio tests with and without the new predictor. Adding crime types as individual predictors ($LRatio = 5.75$, $p = .33$) and officer experience ($LRatio = 1.12$, $p = .89$) did not improve the fit of the model and were not kept for simplicity. The model did not converge when officer race (White vs. minority) was added because of too few data points.

differ from Whites in the strength of this trend. To understand these trends more fully, we combine the estimates from Whites and each of the other racial groups in order to determine group specific patterns based on the model. This is because of the dummy coding used in these analyses, which makes the estimates of the quadratic terms for both Blacks and Latinos into estimated differences for these terms relative to Whites. In particular, Black suspects show no appreciable quadratic effect over time because their estimates differ from Whites in the exact opposite direction by the same magnitude, (i.e., Whites + Blacks, $\beta = -.02 + .02 = 0$). For Latinos, the resulting trend is positive quadratic (i.e., Whites + Latinos, $\beta = -.02 + .04 = .02$), indicating an eventual increase in force used. This difference in the quadratic trend again may result from the fact that they both started at higher levels of initial force.

Although our primary hypothesis of interest was to examine change in use of force over time, the covariates also indicate overall racial differences in treatment. First is the effect of suspect resistance on officer use of force, shown graphically in Figure 2. For White suspects, a unit increase in resistance receives a small additional increase of approximately one sixth of a point in force ($\beta = .16$, $SE = .07$, $p = .02$). Consequently, this effect is amplified for both Black and Latino suspects. Black suspects receive more than an additional one-fifth-unit increase in force ($\beta = .22$, $SE = .11$, $p = .05$), and Latinos ($\beta = .28$, $SE = .13$, $p = .03$) receive more than an additional one-fourth increase in force over and above White suspects when they resist. This equates to a total of a .38 for Blacks and a .44 increase for Latinos in force for a one-unit increase in resistance, respectively.

Finally, Whites who posed a threat to third parties or themselves were associated with an overall increase in force ($\beta = .35$, $SE =$

.06, $p < .001$). Recall that these were threats posed to people other than the officer, which could include other individuals present at the scene or threats to themselves. Blacks and Latinos differed from Whites, such that threats to third parties from Latino suspects ($\beta = -.24$, $SE = .10$, $p = .02$) and marginally from Black suspects ($\beta = -.16$, $SE = .10$, $p = .09$) were associated with less of an increase in force compared with Whites.

Discussion

Examining how police–suspect interactions unfold over time adds a unique perspective as to when and how a suspect’s race alters police behavior. By breaking down police–suspect interactions into discrete sequences, the current study reveals a better understanding of how race can impact police use of force. Using real-world police suspect use-of-force data and controlling for relevant suspect and case variables, results indicate that both Black and Latino suspects received higher levels of police force earlier in interactions, whereas White suspects escalated in force at a greater rate after the initial force levels compared with racial minorities.

When considering why initial rates of force were higher for Blacks and Latinos, we suggest that racial stereotypes may, at least in part, play a role during these initial actions. Racial stereotypes associating Blacks and Latinos with danger may bias perceptions at the beginning stages of an interaction, making the suspects seem more threatening or in need of force to control. Indeed, psychological literature has demonstrated that stereotypes bias perceptions by filling in ambiguous information to be in line with the stereotype, which can ultimately affect decision making (e.g., Correll, Park, Judd, & Wittenbrink, 2002). These stereotypes may be held at either the explicit or implicit level, beneath individuals’ awareness, yet still bias behavior (Greenwald et al., 2009). Thus, it is not necessary that officers consciously endorse or believe in the validity of these stereotypes for their actions to be influenced in accordance with the stereotypes (Kahn & Martin, 2016). Because stereotypes are more likely to influence perceptions and behaviors when the situation is unclear or ambiguous and officers may be lacking individuating information (Bodenhausen, 1988; Greenwald & Banaji, 1995; Hilton & von Hippel, 1996), officers may be more susceptible to the influence of stereotypes at the beginning of an interaction, which is consistent with the present data. As more individualizing information and case-specific details are obtained as the interaction progresses, reliance on global stereotypes may subside.

Alternative ways in which stereotypes might have affected police behavior were not supported in the current data. A stereotype suppression and subsequent rebound effect (Macrae et al., 1994) would suggest lower levels of force earlier on for Blacks and Latinos, and then a sharper increase later in the interaction, whereas a counterbias perspective (James et al., 2013) would suggest lower levels of force throughout the interaction for Blacks and Latinos compared with Whites. Both patterns are not consistent with the current data, instead suggesting that stereotypes are more influential earlier in the interaction.

It is also possible that officers feel the need to take charge early in an interaction with racial minorities, perhaps anticipating resistance or noncompliance in the encounter. In line with Sykes and Clark’s (1975) deference exchange theory, they may then start with higher levels of force to proactively control the situation and

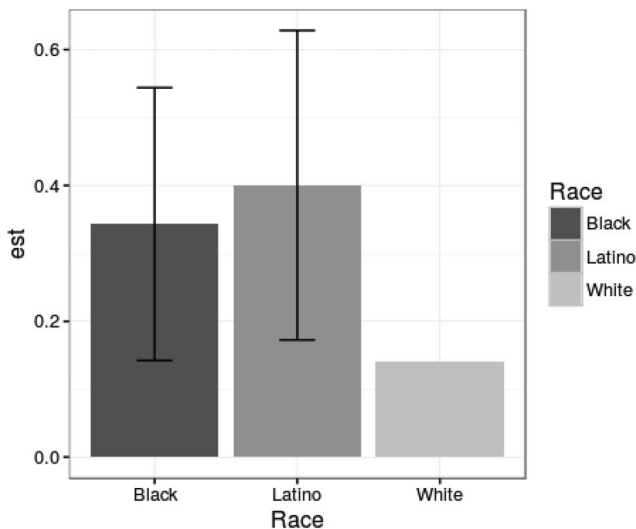


Figure 2. Effect size estimates for suspect resistance based on suspect race on officer use of force. These estimates are conditional, meaning that they are relative to all other terms in the final model. Because suspect race was dummy coded, with White serving as the reference group, the error bars depicted represent the 95% confidence interval (CI) for the difference of each race compared with Whites. The CI estimates for suspect resistance for Whites represent the hypothesis that this value is equal to zero, which is why there are not error bars depicted on the graph.

establish the power dynamic. Anticipated resistance may also enhance the perception of threat that the officer feels, which again biases the interaction toward more severe applications of force. Racial stereotypes or implicit bias may similarly be the root of this anticipation of resistance and experience of threat.

After the disparities in initial force levels, use of force escalated faster for White compared with Black and Latino suspects. This steeper trajectory may be the result of a few factors. Because Black and Latino suspects started at higher level of force initially in the interaction, there may have been less rate of change compared with Whites since their force levels were already capped, suggesting a ceiling effect. It may further indicate that when force is used with White suspects, it is deemed as more necessary or appropriate to control a situation, as more situation specific information is gathered passed the initial entry.

It also may indicate that implicit bias and stereotyping, rather than explicit bias, might be the cause of the racial disparities. As previously stated, implicit bias and stereotypes may play a greater role earlier in an encounter when officers have less available information and must make quick decisions. As the encounter progresses and more information becomes available, disparities in force may dissipate as officers are guided by less biased individuating information and engaging in conscious, controlled processing (Devine, 1989), which is consistent with this study's data. If bias was explicit and overt, racial disparities in force may instead be consistent throughout the interaction, or even be exacerbated as the interaction continued. This pattern is consistent with notions that much of contemporary bias is implicit in nature (Dovidio, 2001; Greenwald et al., 2009), with policing being no exception (Kahn & Martin, 2016).

It is also important to consider that this data set, at the surface, reveals little racial disparities when examined at the final level of force outcome alone. That is, there were no racial disparities in maximum or average level of force, number of sequences in the interaction, suspect resistance, and suspect actions toward third-parties/self. As described earlier, cases included all male suspects and were comparable crime types across racial groups. These similarities in outcomes might lead one to conclude that suspect race has no effect on the interaction. However, examining the interaction at the sequence level reveals a different layer of racial disparities. Black and Latino suspects receiving force earlier in the interaction has important implications, even if maximum levels of force ultimately equate to comparable White suspects. Time is important for officers to assess the situation, engage in de-escalation strategies, and gather information about the suspect and scene. These findings suggest that this discretion is not taken to the same extent with racial minority suspects as it is with Whites. The threshold with which to use force might be lower for Black and Latino suspects. More time and leniency might be afforded to Whites, only escalating in force once it is deemed more necessary, when other options are exhausted, or the situation becomes more serious.

This suggestion is consistent with signal detection theory findings from the shooter bias literature, which examine the underlying judgment differences that lead to racially biased shooting decisions. Evidence from shooter bias shows that, during video simulations, racial stereotypes influence decision making such that unarmed Blacks are shot more often than unarmed Whites (Correll et al., 2002), although the racially influenced response pattern is

more often found in response times than shooting decisions with police samples (Correll et al., 2007). Signal detection analyses on these results show that individuals adopt a more liberal shooting criterion when deciding to shoot Blacks compared with Whites, which leads to a pattern of increased false alarms and decreased misses (Correll et al., 2002; Kahn & Davies, 2011). That is, they require less certainty in judgment before deciding to shoot Black suspects, producing the racially biased shooter bias patterns. In the current study, less certainty may be needed to engage force with Blacks and Latinos early in the interaction, whereas more clarity is required for Whites, leading to the delayed onset for this group. Further, one can extrapolate that higher levels of force may have been less necessary ultimately for Blacks and Latinos, but they were not given the same opportunity for de-escalation as Whites. As these data highlight, differential treatment by race within an interaction can be masked by focusing only on ultimate outcomes.

The current data speak to how force is applied in interactions in which force is eventually used. It is not representative of all police-suspect interactions, as the majority of police-suspect interactions do not involve force (Terrill, 2001). It is also possible that Blacks and Latinos are more likely to receive force compared with no force, making them more likely to end up in our current data set compared with Whites. This argument would be consistent with the adoption of a lower threshold for force application with Whites being more likely to not receive force at all during police encounters.

Racial disparities were also highlighted in officers' reactions to the level of suspects' resistance. When Black and Latino suspects resisted, they received significantly more force than when White suspects resisted. In line with racial stereotypes of criminality (Devine & Elliot, 1995; Madon et al., 2001), this pattern may be because officers view resistance from Blacks and Latinos as more threatening or dangerous, in need of greater control. They may therefore respond with increased force to subdue the perceived threat. Alternatively, because of racial bias, the level of resistance may be used to "justify" greater force against Black and Latino suspects as punishment for noncompliance. Further, noncompliance may be perceived differently coming from a racial minority suspect, given the sociocultural context regarding perceived racial bias in policing and the national discussions concerning the shootings of unarmed racial minorities. It may engender historically tense relationships or broader notions of noncompliance and defiance of police by racial minorities (Kaduce & Greenleaf, 2000), of which the corresponding officer response is to increase force. This effect may be heightened when it is a White officer interacting with racial minority suspects, thus increasing the perceived societal status and power differences between the officer and suspect.

Similar disparities were also noted in regard to suspects' actions toward third parties and themselves. This measure represents the level of perceived threat that suspects enacted toward others present at the scene or toward themselves, for example, through threats of suicide. Although these threats were associated with an increase of force for all suspects, there was less of an increase for Black and Latino suspects. This might suggest that threats made by Whites were seen as more in need of immediate forceful action to subdue, whereas those made by Blacks and Latinos were perceived less so. These threats may have also been made toward different racial groups present at the scene, which may be perceived with varying levels of necessity for control. Threats toward other racial minor-

ities, for example, may be judged as less in need of immediate action. Harm directed toward White third parties, and White women in particular, may be acted upon more quickly or forcefully in order to more fully protect White victims (e.g., Davis, 1983; McMahon & Kahn, 2016). Because we did not differentiate between threats to different types of third parties (e.g., another officer, an innocent bystander, an intimate partner) or the self, and the race and gender of the third party present was not available in the narratives (e.g., threatening an unidentified neighbor), we are unable to test this hypothesis. Further examination is needed to differentiate these potential causes and disaggregate these effects.

The current study carries implications for improving police training and policy. First, it informs when to focus interventions to combat police bias in use of force. It suggests that police training should put particular emphasis on the beginnings of interactions when stereotypes and race can have a larger potential impact. The initial assessment of a scene and engagement with a suspect set the stage for how the encounter unfolds and the levels of force the encounter ultimately employs. Having these initial assessments not be influenced by suspect race will lead to more equitable and fair interactions. Further, training should also focus on suspect resistance and perceived threats in the situation, as racial disparities were found across interactions on these variables. These outcomes may also be rooted in racial stereotypes, and thus training which focuses on the reduction of both implicit and explicit stereotypes on police behavior may be fruitful here as well. Police use-of-force policies can also influence the application of force (Terrill & Paoline, 2013), so policies may be useful in promoting more equitable interactions. Policies that emphasize the use of more de-escalation techniques or gathering of individuating information before force is employed, particularly for racial minorities, may be particularly effective in light of the current study's findings.

Many policing agencies have traditionally relied upon on a use-of-force continuum (also called levels of control) to help guide officers in the appropriate application of force (e.g., Aveni, 2003; Terrill & Paoline, 2013). This system is a mechanical model of force in which the officer's actions are guided by the suspect's level of resistance, with deviations in severity being deemed excessive. However, increasingly, courts have required officers to more closely examine the "totality of the circumstance" in the application of force (Graham v. Connor, 1989), which encourages a system focused on the perceived threat posed to the officer (Wallentine, 2009). With this change in emphasis away from objective standards and guidelines to a more open or fluid definition, officers can use more force relative to resistance if they perceived the suspect as being more of a threat. Reliance on stereotypes or implicit bias may lead the officer to perceive more threat initially in an interaction with racial minorities, above and beyond resistance, which is then used to justify subsequent application of force. Police standards that only emphasize perceived threat as justification for force may therefore, unintendedly, exacerbate racial disparities in police use of force.

There are limitations that should be noted when considering the findings from this study. As is common in criminal justice research on police use of force (e.g., Hickman et al., 2015; Terrill, 2001), the study used police use-of-force case narratives written by officers after a use-of-force incident to study the interactions. These narratives are supposed to be an objective assessment of the scene, with sufficient detail to be used as evidence should a case reach

court. They are often verified by other officers and supervisors for correctness (Terrill, 2001). However, despite these protections, they still primarily reflect the officer's perspective of what happened in the situation, which might vary from the suspect's interpretation or from objective video evidence. Given that officer bias might influence their narratives of the interaction in a way that protects themselves or justifies their actions, that racial disparities were still found is revealing and perhaps underestimates the strength of the effects found. With the increased national push for police to wear body cameras, future research might consider using body camera recordings of use-of-force incidents to replicate these findings. Other research may examine how closely these police narratives match video recordings of incidents.

The current study is also limited in that its data are pulled from one medium to large sized urban West Coast city in the United States, which is not necessarily representative of all cities, and also reflect a relatively small sample size because of the time-intensive nature of the data coding. The city from which the police reports were drawn is predominately White, suggesting limited generalizability in locations where the majority of denizens are racial minorities. Therefore, caution should be taken in generalizing these results across other cities in the United States. Further, because of the exclusion of racial groups that did not have at least 10 suspects during the coded time period, we were not able to examine any cases involving Asian or Native American suspects, limiting generalizability to other racial minorities. Given these limitations, it is suggested that this procedure be replicated in different contexts and departments to gain generalizability. Finally, the small sample size necessitated analysis of only male suspects. Disparities may also exist when examining suspect gender in how an interaction unfolds, which could provide important information. Further, suspect race and gender may also interact to produce different patterns of interactions in unique ways, which should not be discounted (Goff & Kahn, 2013).

Results from the current study highlight how suspect race differentially changes and shapes an interaction between law enforcement officers and suspects. Only by systematically understanding when and how race pervades each aspect of a police-suspect interaction will ways to counter its effects be truly possible.

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