

Police Research, Officer Surveys, and Response Rates

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Abstract

In recent years, policing scholars have increasingly used survey methods to gain insight into officers' attitudes and behaviors. Yet, surprisingly, methodological research analyzing surveys of police officers is rare. We analyzed the extent and correlates of response rates in police surveys, providing insights about the survey design features and study characteristics associated with higher rates of officer participation. We examined the response rates to 497 police surveys reported in 390 articles published in 15 journals from 2008 to 2017. Findings included the following: (1) the average response rate was 64%, but there was a great deal of variation, (2) in-person surveys achieved substantially higher response rates, (3) inviting a greater number of officers to participate in surveys was associated with lower response rates, and (4) response rates have declined over time (though primarily among surveys not administered in-person). We recommend minimally acceptable reporting standards and discuss avenues for future research.

Keywords: policing; law enforcement; survey research; response rates; unit nonresponse

Police Research, Officer Surveys, and Response Rates

Over the fifty-year history of police research, the characteristics of the researchers involved (e.g., ‘inside insiders’ versus ‘outside outsiders’), their agendas (e.g., supportive versus critical), and the methods used have varied considerably (Brown 1996, Reiner 2000, Thomas 2014). One constant has been the enormous formal and informal challenges to gaining access to police officers for research purposes (Reiner 2000). Until recently, the majority of police research was ethnographic using participant observation (Reiner 2000, Squires 2016). However, growing interest in evidence-based policing, new administrative models (e.g., organizational justice), and police use of force has motivated a larger number of quantitative studies, which increasingly have involved surveys of police officers (Martin and Tong 2016). Additionally, mounting concerns about increased police-civilian tensions in countries like the United States and the potential for de-policing (Nix, Wolfe, *et al.* 2017, Shjarback *et al.* 2017, Weitzer 2015) have rendered survey research examining officers’ attitudes, fears, and behaviors even more important (e.g., Morin *et al.* 2017).

Unfortunately, methodological research analyzing surveys of police officers is rare. As a consequence, the guidance available to researchers seeking to conduct police surveys is shockingly thin and often inconsistent. In turn, the strategies, norms, and best practices for designing, conducting, and evaluating police surveys remain unclear. Although the broader literature on survey research methods is a useful starting place (e.g., Babbie 1992, Dillman *et al.* 2014, Groves *et al.* 2009), there are unique difficulties to surveying police officers. These include, but are not limited to, the target population being close-knit and especially distrustful of outsiders, and the necessity of obtaining (and maintaining) formal approval from police supervisors (and often multiple supervisors and union representatives) (Reiner 2000, Skogan 2015).

Given the many barriers to surveying police officers, it would be reasonable to expect relatively low response rates in police surveys. This is important because researchers, reviewers, and editors often rely on response rates to estimate the quality of data from surveys (Byrne 2000, Peytchev 2013). Carley-Baxter *et al.* (2009) surveyed journal editors from several disciplines and found that nearly 90% said survey response rates were either somewhat or very important in publication decisions. What, then, is the minimally acceptable response rate for a survey of police officers? Likewise, what survey design features are associated with higher response rates in police surveys?

Regrettably, research methods texts in criminal justice provide inconsistent (and incorrect) information about response rates in general, and virtually no guidance about surveying police officers specifically. For example, Maxfield and Babbie (2014, p. 247) state that ‘a response rate of at least 50 percent is adequate for analysis and reporting,’ Jennings and Reingle (2014, p. 67) argue that ‘60 percent is considered minimally acceptable,’ but Bachman and Schutt (2014, p. 216) assert that ‘even a 70% response rate is not much more than minimally acceptable.’ Skogan (2015) partnered with a professional survey research organization to conduct a rigorous computer-assisted self-administered survey of police officers in Chicago. To increase participation, they prenotified officers about the survey, excluded questions about highly sensitive topics, enlisted the help of numerous insiders (e.g., the Chief of police and district commanders), and had survey ‘sales representatives’ answer questions about the survey at roll calls. Yet, the survey still achieved a response rate of only 25 percent. Are the resultant data from Skogan’s (2015) police survey of sufficient quality for analysis and reporting?

The objective of the current study is to start an informed discussion about police survey research. Our focus is on response rates in surveys of police officers. We begin by reviewing the

broader literature on survey response and scholarship on the unique barriers to police research. Next, we examine the response rates to 497 police surveys reported in 390 articles published in 15 journals from January 2008 to March 2017. Our analysis examines the extent and correlates of survey response, providing insights about the survey design factors associated with higher response rates in police surveys.

Consequences of Survey Nonresponse

Although universally agreed upon definitions and reporting standards remain elusive (Smith 2002), the response rate in a survey is normally defined as the percentage of the eligible (or potentially eligible, when eligibility is unknown) sample members who complete the questionnaire (although the definition of what constitutes a ‘completed interview’ can vary) (AAPOR 2016, Groves *et al.* 2009). Nonresponse occurs when researchers fail to contact all sampled respondents (noncontacts), or when they are unable to elicit cooperation from all of those individuals who are contacted (refusals) (Dillman *et al.* 2002). Response rates in surveys are important because nonresponse poses two serious problems for research.

The first problem created by survey nonresponse is reduced sample size and/or greater research costs. The lower the response rate, the smaller the final sample of respondents, unless additional time and resources are devoted to increasing the sample size. In turn, a smaller sample size results in greater sampling error and lower statistical power, which reduces the precision of resultant survey estimates and increases the risk of Type 2 errors (false negatives) (Cohen 1992). Because statistical power is inversely related to sample size, even when findings are statistically significant, there is a greater risk of making Type S (sign) and M (magnitude) errors in studies with smaller samples (Gelman and Carlin 2014). Thus, lower response rates, by reducing sample size, can make it harder to reject the null hypothesis when effects exist, and, when the null

hypothesis is rejected, render it more difficult (or even impossible) to accurately estimate the direction and size of those effects.

The second problem—or *potential* problem—created by survey nonresponse is nonresponse bias (Peytchev 2013). Nonresponse bias occurs when the propensity to respond (P) is correlated with survey variables (Y) (Groves 2006, Groves and Peytcheva 2008). When P is correlated with Y, the magnitude of nonresponse bias will be a function of the strength of that correlation and the amount of nonresponse (average P in the target population) (Bethlehem 2002). However, regardless of the response rate, survey estimates will be unbiased if Y is independent of P (zero covariance), or if Y and P are associated only because of common causes (Z) and statistical adjustments are used to control for Z (zero covariance, controlling for Z) (Groves *et al.* 2009, pp. 191-192). Nonresponse is ‘nonignorable’ when there is a direct causal relation between Y and P—that is, when Y causes P (Groves *et al.* 2009). An example would be if support for body-worn cameras affected response behavior in a survey designed to estimate officers’ support for body-worn cameras.

Previous Studies of Survey Response Rates

Although there is no prior research on response rates in policing studies, there is a large literature on response rates to surveys in general (Groves *et al.* 2002, Peytchev 2013). Researchers have examined the extent, correlates, and outcomes of survey nonresponse. Groves and Peytcheva (2008) examined response rates from 59 surveys, and found that they ranged from 28% to 86%, with an average of 64%.¹ Macias *et al.* (2008) examined the response rates of 565 surveys published in 46 different communication-related journals between 1990 and 2002. They found that the average response rate was 50.5%. Analyzing 308 survey administrations in the

¹ Groves and Peytcheva (2008) reported *non*response rates. The figures we report are the inverse of the nonresponse rates they reported.

field of counseling and clinical psychology, Van Horn and colleagues (2009) found an average response rate of 49.6%. Holbrook *et al.* (2008) investigated response rates in 114 random-digit-dial (RDD) telephone surveys, which were conducted between 1996 and 2005 by either government contractor survey research firms or news organizations, and found that they ranged from 4% to 70%, with an average of 30%.

Studies have also documented long-term declines in response rates to many different types of surveys (Curtin *et al.* 2005, Kohut *et al.* 2012). The decline in response rate occurred across surveys with different sponsors (e.g., government versus private sponsorship) and across modes of administration (e.g., in-person versus telephone) (Brick and Williams 2013, Groves *et al.* 2009). For example, over the past few decades, the initial rate of nonresponse has nearly doubled in the Current Population Survey, and more than doubled in the National Crime Victimization Survey (Tourangeau and Plewes 2013). The typical response rate in Pew Research telephone surveys fell from 36% in 1996 to just 9% in recent years (Keeter *et al.* 2017). Unfortunately, it remains unclear whether a similar decline in response rates has occurred in surveys of police officers.

Unsurprisingly, given declines in response rates, another growing area of research is examining the consequences of survey nonresponse for nonresponse bias. Several studies have focused specifically on telephone surveys. For example, scholars have assessed whether the representativeness of telephone surveys has declined over time with declines in response rates (Curtin *et al.* 2000, Keeter *et al.* 2017, Kohut *et al.* 2012). The general finding has been that despite achieving much lower response rates now, compared to previous time periods, telephone surveys continue to provide very accurate prevalence estimates (Dutwin and Buskirk 2017). Keeter *et al.* (2017, p. 1), for example, found ‘that the bias introduced into survey data by current

levels of participation is limited in scope.’ Other studies have explored whether taking extra steps to increase response rates in telephone surveys reduces nonresponse bias. In one experiment, Keeter *et al.* (2000) achieved similar estimates from a rigorous telephone survey that achieved a 61% response rate and a standard telephone survey that achieved only a 36% response rate. Finally, Holbrook *et al.* (2008, p. 527) compared estimates from 114 telephone surveys that exhibited great variation in response rates, and found that ‘response rates were positively associated with demographic representativeness, but only very weakly.’

Researchers have also investigated the relationship between response rates and nonresponse bias in surveys generally, regardless of the mode of administration. To illustrate, Yeager *et al.* (2012, p. 730) compared estimates from several surveys—probability surveys administered via the Internet or telephone, and nonprobability surveys administered via the Internet—with varying response rates and found that ‘remarkably, higher response rates were associated with *lower* accuracy of the surveys’ (emphasis added). This was true regardless of administration mode. Peytcheva and Groves (2009, p. 198) reported a similar finding: ‘as [the] nonresponse rate goes down, bias goes up! Such a counter-intuitive finding has been demonstrated with the 1998 Dutch integrated Survey on Household Living conditions (POLS) – the increase in response rate from 47% to 60% over a month resulted in larger biases in key survey statistics.’ This can occur when efforts to increase participation only do so among those types of sampled individuals who are already more likely to participate—thus increasing differences between responders and nonresponders. In the largest study to date, Groves and Peytcheva (2008, p. 174) meta-analyzed 59 methodological studies examining nonresponse bias, and found that the response rate was ‘a poor predictor of the absolute relative nonresponse bias ... if a naïve OLS regression line were fit to the scatterplot, the R^2 would be 0.04.’

Nonetheless, virtually all studies of nonresponse bias have consistently found that large nonresponse biases often exist (Amaya and Presser 2017, Groves and Peytcheva 2008). Why then is the response rate of a survey, which certainly increases the risk of nonresponse bias (Groves *et al.* 2009), a weak predictor of nonresponse bias in estimates? The explanation is that nonresponse bias varies primarily within surveys, across different estimates, rather than between surveys (Peytchev 2013). Specifically, nonresponse bias occurs when the propensity to respond (P) is correlated with the survey variable of interest (Y), either because the survey variable affects the propensity to respond ($Y \rightarrow P$), or because there are other variables (Z) that are common causes of both ($P \leftarrow Z \rightarrow Y$) and are uncontrolled (Groves *et al.* 2009). For this reason, there may be large a nonresponse bias in the estimate for one variable within a survey, but not for another. Additionally, although limited, the evidence to date suggests that nonresponse bias tends to be much larger in univariate estimates than multivariate findings (Amaya and Presser 2017, Heggstad *et al.* 2015, Lepkowski and Cooper 2002, Martikainen *et al.* 2007).

There is a sizable literature on the factors influencing the propensity to respond to surveys in general (Groves *et al.* 2002), and in some specific types of criminal justice surveys, such as inmate surveys (Pickett *et al.* 2014). Unfortunately, we are unaware of any previous research exploring whether similar factors influence response rates specifically in police surveys. For our purposes, the most relevant research is that exploring how survey design characteristics influence response rates. Prior studies have found that response rates vary significantly across different administration modes. In general, response rates tend to be highest in face-to-face surveys, lowest in Web surveys, with telephone and mail surveys falling in the middle (Groves *et al.* 2009, Tourangeau and Plewes 2013). For example, in the field of communication, Macias *et al.* (2008, p. 86) found that average response rates varied by mode, as follows: face-to-face, 79%;

telephone, 61%; mail, 42%; and email, 30%. Shih and Fan's (2009) meta-analysis found that response rates were about 11 percentage points lower in Web versus mail surveys. Manfreda *et al.* (2008) reported similar findings.

Peak (1990) argued that a 'personal touch' can improve response rates for mail surveys (e.g., postage stamp appeal, personalized cover letters, and high-quality paper; see also Babbie 1992). Research has also demonstrated that prenotification, increased contact attempts, survey sponsorship, and incentives increase response rates (Dillman *et al.* 2014, Groves *et al.* 2009). Government- and university-sponsored surveys achieve significantly higher response rates than surveys with other sponsors (Edwards *et al.* 2002, Groves and Couper 1998, Heberlein and Baumgartner 1978). There is strong evidence that incentives increase response rates in all modes, but the effect depends on the type and amount of the incentive (Singer 2002). Specifically, pre-paid incentives outperform promised or lottery incentives, monetary incentives outperform non-monetary incentives (e.g., gifts), and larger incentives outperform smaller incentives, but they do so at a declining rate (Church 1993, Singer and Ye 2013). Again, and unfortunately, there is little evidence about whether these same factors influence response rates in surveys of police officers.

Considerations in Surveying the Police

Researchers face a number of unique challenges when surveying police officers – the first of which is gaining access to the officers (Reiner 2000, Skogan 2015). Besides often requiring permission from the agency head just to administer the survey, the researcher might also need a key officer, such as a respected sergeant or lieutenant, to help distribute (or encourage participating in) the survey (Skogan 2015). Officers are asked frequently to complete surveys and often suffer from survey fatigue. Thus, having an 'insider' help encourage participation can be beneficial. Likewise, another important consideration is whether the researcher has

administrative or union approval. While administrative approval may be required simply to gain access to the officers, it may be seen by line-level officers as a reason *not* to respond. On the other hand, union or bargaining unit approval might enhance response rates.

Researchers must also carefully consider their desired sampling frame. Depending on the nature of the survey, they may wish to target all employees, strictly sworn employees, or perhaps only certain ranks, units, or divisions. For example, if a researcher sets out to survey all sworn officers in-person via roll call meetings, he must bear in mind that a significant portion of the sampling frame could be absent on any given day due to court, vacation, sick leave, or special assignments (Skogan 2015). In our own experience administering police surveys, as many as 1 in 4 officers could be absent from any given roll call meeting because of sick leave, administrative leave, special assignment, or other reasons.

Finally, researchers must take added precaution to ensure anonymity in order to increase participation – as well as honesty among those who do participate. This is especially important if the survey pertains to sensitive topics such as police use of force or misconduct. Simply requesting information about years on the job, gender, race, and rank, for example, might turn some officers away who fear sharing that information could compromise their anonymity. For example, a female Lieutenant with 16 years of service in Division ‘A’ could easily be identified if there are only one or two officers who fit those demographics. Of course, even if such information is not requested by the researcher, some officers may still be skeptical that their identities will remain anonymous. Overall, then, there are many details researchers must consider when surveying police officers.

The Current Study

Prior research finds significant differences in response rates to surveys, depending on the target population (Anseel *et al.* 2010, Heberlein and Baumgartner 1978, Van Horn *et al.* 2009). As important, studies have shown that the effect of survey design features on response rates varies across target populations (Anseel *et al.* 2010). Previous studies also suggest that certain strategies for increasing response rates may work best with particular target populations (Groves *et al.* 2000, Pickett *et al.* 2014). The above scholarship thus raises questions about whether findings about survey response rates in general population surveys will generalize to surveys of police officers. As important, it is currently unclear what the ‘typical’ response rate is in police surveys, whether they have declined over time, or whether they vary by mode or other survey design characteristics. The current study posed the following research questions:

1. What is the average response rate for police surveys published in the field of criminology and criminal justice?
2. Do police survey response rates vary substantially from journal to journal, by journal type, or journal impact?
3. Have police survey response rates fluctuated over time?
4. What police survey design features are associated with higher response rates?

Methods

Data Collection

Data collection occurred from March to May of 2017. The first step was to identify the journals to include in our sample. From the American Society of Criminology’s Division of Policing website (www.ascpolicing.org), we identified eight policing journals:

1. *European Journal of Policing Studies*
2. *International Journal of Police Science & Management*
3. *Journal of Police and Criminal Psychology*
4. *Policing: An International Journal*

5. *Police Practice & Research*
6. *Police Quarterly*
7. *Policing: A Journal of Police and Practice*
8. *Policing & Society*

We also wanted to include a selection of criminology journals with broader foci in our sample.

Using Thomson Reuters' 2015 Journal Citation Reports, we selected the following eight journals listed under 'Criminology and Penology':

1. *British Journal of Criminology*
2. *Crime & Delinquency*
3. *Criminal Justice and Behavior*
4. *Criminology*
5. *Journal of Criminal Justice*
6. *Journal of Research in Crime and Delinquency*
7. *Journal of Quantitative Criminology*
8. *Justice Quarterly*

These eight generalist journals were selected because they are regarded as among the most prestigious journals (Sorenson 2009), are widely read by the field, and publish manuscripts focusing on a variety of criminology and criminal justice-related topics beyond policing. In total, we initially identified 16 journals to scan in order to construct our dataset. However, we could not get online access to *European Journal of Policing*, which has published four volumes to date. As such, our sample included seven policing journals and eight criminology journals.

Coding Procedure

Next, two members of our research team visited each journal's website and scanned every published article (including those available online first) dating back nine years, to 2008. For policing journals, we downloaded every article and scanned the abstracts and/or methods sections in order to determine whether a survey of police officers was involved. Once we determined whether or not each article included one or more police officer surveys, we then

scanned the text for a response rate. This process resulted in the identification of 497 unique surveys, published in 390 articles between January 2008 and March 2017.²

It is important to note that for 43 surveys (about 10 percent of the sample), we calculated the response rate on our own, using other information provided by the authors (e.g., dividing the number of responses by the known sampling frame). We were unable to surmise the response rate for 77 surveys (roughly 15 percent of the sample; see Table 1). Thus, the response rate was not immediately apparent for approximately 25 percent of the surveys in our sample. Moreover, our search revealed zero police surveys published in *Journal of Quantitative Criminology* or *Journal of Research in Crime and Delinquency* (JRCD) during this timeframe. We are not sure whether this surprising finding reflects a lack of relevant submissions by authors or the publication decisions at these specific journals. For example, from personal experience, we know that a previous editor of JRCD—who coauthored the research textbook suggesting that a 50% or higher response rate is required for analysis and reporting (Maxfield and Babbie 2014) — sometimes explicitly pointed to a low response as a primary reason for rejecting or even desk rejecting (without external review) submissions analyzing survey data.

Results

The average response rate for police officer surveys published in the aforementioned journals over this nine-year period was 64.3 percent. As expected, there was a great deal of variation: response rates ranged from a low of 5.2 percent to a high of 100 percent (standard deviation: 25.9). The mean response rate across the seven policing journals ranged from a low of 54.4 percent (*Policing: A Journal of Policy and Practice*) to a high of 66.6 percent (*Policing: An International Journal*). The mean response rate across our selection of eight criminology

² Note that some articles involved multiple surveys (e.g., Gaub *et al.* 2016). In these instances, we treated each survey as a separate case in our dataset.

journals ranged from a low of 66.2 percent (*Crime & Delinquency*) to a high of 95.1 percent (*Criminology*; though note this is based on 2 surveys). Table 1 provides a breakdown of response rates by each individual journal. As a general observation, most of these average response rates barely meet the ‘minimum acceptable’ response rate standards outlined in criminal justice research textbooks (Bachman and Schutt 2014, Jennings and Reingle 2014, Maxfield and Babbie 2014). Further, a large proportion of the police surveys published in leading journals—up to half in some journals—fail to meet these standards, achieving response rates as low as 5.2 percent. At this point, it bears emphasizing that in contrast to the advice in the research method textbooks in our field, leading survey methodologists stress that there is no valid cutoff point for considering a response rate acceptable (Groves 2006, Peytchev 2013).

[Table 1 about here]

Survey Design and Study Covariates Expected to Predict Response Rate

Survey Year

Research has demonstrated that survey response rates have diminished over time (Curtin *et al.* 2005, Kohut *et al.* 2012). As such, we documented when each survey was administered, based on the timing of the end of data collection. Initially, we could only determine when the data were collected for 333 of the 497 surveys in our sample (67 percent). To be clear, the implication is that this key survey design information was not reported in approximately one-third of published police surveys. We sent emails to the corresponding authors of the articles that contained the remaining 164 surveys, and were ultimately able to ascertain the data collection period for an additional 117 surveys (bringing our total to 450, or roughly 90 percent of our sample). We used this information to create a variable, *Survey Year*, which ranged from 1996 to 2016. In cases where data collection spanned multiple years (e.g., December 2014 to March

2015), we coded the year when data collection stopped. Table 2 provides descriptive statistics for this variable and all others used in subsequent multivariate analyses. At a bivariate level, there was a significant negative correlation between survey year and response rate ($r = -.22, p < .001$), indicating that response rates in police surveys have declined over time. This relationship is shown in Figure 1, which plots response rates by survey year.

[Table 2 about here]

[Figure 1 about here]

Mode

Based on prior research, we expect that surveys administered in-person receive, on average, higher response rates than surveys administered by mail, phone, or internet (Groves *et al.* 2009, Tourangeau and Plewes 2013). We therefore documented the mode of administration for 421 surveys as indicated by the article's author(s). Again, it is noteworthy that 76 surveys (roughly 15 percent of our sample) were published without providing clear indication of how they were administered. This is vital survey design information; mode of administration is itself associated with nonresponse bias (Groves and Peytcheva 2008). Among those where information was provided, face-to-face surveys were common. Figure 2 presents the breakdown by survey mode: 47.5 percent were administered at police headquarters, during roll calls, or at training classes. Roughly 25 percent of surveys were web-based, and the remaining 27 percent were collected through the mail or by phone. We therefore created a dichotomous variable, *In-person*, coded 1 if the survey was administered face-to-face and 0 otherwise. A small number of cases ($n=13$; 3 percent) involved the use of multiple modes of administration. These were coded 1 since a portion of the desired sample had responded to the survey in-person. At a bivariate level,

surveys administered in-person achieved significantly higher response rates than those administered by other means ($t = 13.907$, $p < .001$).

[Figure 2 about here]

Number of Invitations Sent

It is feasible that inviting a greater number of officers to take a survey could produce a lower response rate by: 1) increasing the complexity of survey administration protocol, 2) reducing the amount of time and resources that researchers must devote to recruiting each individual sample member, and/or 3) requiring approval from and/or the involvement of a greater number of police administrators. For example, it is undoubtedly easier to obtain a 100 percent response rate when the number of officers invited to take the survey is 10 at one agency versus 100 or 1,000 at multiple agencies. Thus, police researchers may face a tradeoff between increasing sample heterogeneity (e.g., by surveying multiple agencies) or maximizing response rates. Accordingly, we documented the number of invitations whenever it was provided by the authors. A total of 364 surveys (73% of our sample) included this information. We used the information to create a continuous variable – *Invitations* – which initially ranged from 10 to 83,550 (median = 350). Because a small number of surveys involved an extremely high number of invitations, we top-coded at the 95th percentile (Barnett and Lewis 1994).³ At a bivariate level, number of invitations was inversely correlated with response rate ($r = -.40$, $p < .01$) – such that greater numbers of invitations were associated with lower response rates.

Funding

³ Top coding is a common strategy in our field for reducing the influence of outliers (e.g., Anwar and Loughran 2011, Slocum *et al.* 2013). However, substantively identical results were obtained when models were estimated without top coding and using robust regression.

As noted, government- or university-sponsored research typically yields higher survey response rates than non-sponsored research (Edwards *et al.* 2002, Groves and Couper 1998, Heberlein and Baumgartner 1978). Additionally, funded studies likely have greater resources that can be devoted to data collection and converting initial nonrespondents. Unfortunately, virtually none of the published studies provided information about whether a specific sponsor was listed in the questionnaire for respondents. We therefore focused on funding. We checked the ‘Acknowledgements’ section of each article, or for articles without such a section, scanned for mention of any of the following terms: ‘grant,’ ‘fund,’ ‘award,’ and ‘sponsored.’ A total of 127 surveys (approximately 25 percent) reported receiving some sort of grant or scholarship funding. We therefore created a dummy variable – *funded* – coded 1 if the authors mentioned their research was supported by funding and 0 otherwise. However, at a bivariate level, funded and non-funded surveys did not significantly differ in terms of response rates ($t = 0.877$, $p = .38$).

Location

We also examined whether officers working in the United States might be more or less inclined to respond to surveys than officers working elsewhere. We created a dummy variable – *US Sample* – coded 1 if the survey was administered to US police officers and 0 otherwise. Approximately 51 percent of the surveys in our sample were administered to U.S. police officers. At a bivariate level, surveys with U.S. police officers did not significantly differ in terms of response rate from surveys of police officers employed elsewhere ($t = 1.216$, $p = .22$).

Incentives

We attempted to code for whether or not researchers offered any sort of incentive to take their surveys, as the evidence suggests incentives increase response rates (Singer 2002). To do so, we scanned articles for mention of any of the following terms: ‘incentive,’ ‘dollar,’

‘compensate,’ and ‘offer.’ However, surprisingly, this methodology revealed that virtually none of the articles in our sample included any information about whether incentives were used. Again, then, it appears that key survey design information is often omitted from publications using police survey data. Nonetheless, if we make the conservative assumption that all articles which used incentives reported doing so, we found that 12 surveys (2.4 percent of the sample) included an incentive (e.g., gift cards, coffee and donuts, t-shirts). Nine of these 12 surveys reported a response rate. Those 9 surveys achieved an average response rate of 59.2 percent, which is lower, surprisingly, than the average response rates in surveys not reporting incentives. At the same time, given the very small sample size and ambiguousness of reported survey design information, this result should clearly be interpreted with considerable caution.

Journal Type

A cursory glance at Table 1 suggested that surveys published in criminology journals might have, on average, higher response rates than surveys published in policing journals. Perhaps the general criminology journals have a higher informal standard for what constitutes an acceptable response rate. There may also be differences in the rigorousness of studies published in specialty versus generalist journals. Or, it could be that more established researchers – who have more connections to police executives – typically achieve better response rates and therefore submit their research to these journals rather than policing-specific journals. To consider these possibilities, we created a dummy variable, *Crim Journal*, coded 1 if the survey was published in one of the criminology journals and 0 if it was published in one of the policing journals. At a bivariate level, surveys published in the generalist criminology journals achieved significantly higher response rates than those published in the policing journals ($t = 2.085$, $p = .04$).

Impact Factor

We further noted that the criminology journals had higher impact factors according to Thomson Reuters' 2015 Journal Citation Reports – each of these journals ranked in the top 22 out of 57 journals indexed under 'Criminology and Penology.' Conversely, only one policing journal cracked the top 30 (*Policing & Society*, ranked 15th). Similar to the above discussion, impact factor may be related to response rates, such that researchers who achieve poor response rates may shy away from submitting to higher impact journals due to fear of being rejected. Or there may tend to be differences, on average, in the methodological expertise and/or rigorousness of authors who tend to publish in low versus high-impact journals. As such, we sought to include some sort of measure of the journal's impact – but four of our seven policing journals were not indexed as of 2015. Accordingly, we turned to Sorenson (2009), which provides an alternative measure of journal impact factor for all but two of the journals in our sample – *British Journal of Criminology* and *Policing: A Journal of Policy and Practice*. To impute a value for surveys published in *British Journal of Criminology*, we found four journals that Sorenson (2009) *did* score which had similar impact factors (within 0.1 point) according to the 2015 Journal Citation Reports, and used those journals' average Sorenson score.⁴ *Policing: A Journal of Policy and Practice* was not included in Sorenson (2009) nor the 2015 Journal Citation Reports. We assigned this journal a score of 0. *Sorenson* ranges from 0 to 1.21 with a mean of 0.12. At a bivariate level, *Sorenson* was positively and significantly correlated with response rate ($r = .12, p = .02$).⁵

⁴ The four journals were *Policing & Society*, *Journal of Criminal Law & Criminology*, *Journal of Interpersonal Violence*, and *Youth Violence and Juvenile Justice*. The resulting formula used to impute a Sorenson score for *British Journal of Criminology* was $(0 + .09 + .09 + .03)/4 = .05$.

⁵ While we include a measure of each journal's impact factor in our analyses, we recognize the limitations of such metrics (Baker 2015). Perhaps we need to revise our concept of 'impact.' Currently, it refers to who cites which paper, and in which journal. This means that impact operationally measures our willingness to cite each other, and is

Multivariate Analysis

Table 3 presents the results of an ordinary least squares (OLS) equation that regressed our dependent variable *response rate* onto each of the seven covariates.⁶ The model as a whole was statistically significant ($F = 31.86, p < .001$) and explained roughly 42 percent of the observed variation in response rates. Three variables were significantly associated with the outcome: *survey year, in-person, and invitations*. Survey year was negatively associated with response rate. The point estimate ($b = -.532, p < .05$) suggests that with each passing year, response rates in our sample declined by approximately 0.5 percentage points. In-person administration ($b = 24.046, p < .01$) was strongly related to response rate, such that surveys administered face-to-face yielded, on average, a 24 percentage points higher response rate than surveys administered online, through the mail, or over the phone. Finally, the point estimate for the number of invitations sent was negative and statistically significant ($b = -.010, p < .01$). Researchers who invited a greater number of officers to take their survey typically achieved a lower response rate. That is, for every additional 100 officers invited to take the survey, response rate declined by approximately 1 percentage point. The regression model additionally suggests that funding, journal type, and journal impact were not significantly associated with response rate. Furthermore, surveys administered to police in the United States did not yield significantly higher or lower response rates than surveys administered elsewhere.

[Table 3 about here]

Finally, we ran an additional OLS regression model whereby we considered whether the effect of survey year on response rate was moderated by administration mode. It is feasible that

influenced by how often the journal is published, and how often it publishes articles in a particular field, among other factors. Currently, it is not a measure of impact on the world that is being studied.

⁶ We used robust standard errors in order to account for heteroskedastic error terms (Hayes and Cai 2007).

noncontacts and refusals – both of which are related hydraulically to response rate – have increased particularly among mail, telephone, and e-mail surveys due to growing difficulties in reaching people when they are at home and high levels of advertisements and spam. For example, according to Kaspersky Lab (n.d.), spam has comprised between 52 and 71 percent of all emails over the last three years. Likewise, a survey invitation received via mail/email is easier to overlook or mistake for spam, especially if the recipient does not recognize the sender (see Vehovar *et al.* 2002). By contrast, in-person surveys administered in police agencies (e.g., at roll calls) would likely be less impacted by these problems. To consider whether administration mode moderated the effect of survey year on response rate, we included in the model an interaction term: *in-person*survey year*. The point estimate was statistically significant ($b = 1.182$, $p = .04$, 95% CI = [.053, 2.310]), which suggests that administration mode indeed moderated the effect of survey year on response rate. Figure 3 graphically depicts the interaction effect (full regression results available upon request). Inspection of the Figure reveals that the decline in response rates over time appears primarily to be restricted to surveys administered via mail, phone, and the Internet. Face-to-face survey response rates, on the other hand, remained relatively stable over this period. With these results in mind, we now turn to a discussion of the implications of our study.

[Figure 3 about here]

Discussion and Conclusion

Police surveys are vital to enhancing our understanding of officers' attitudes, beliefs, customs, and ultimately, behaviors – perhaps more than ever given the current climate of distrust between citizens and police in the United States (Weitzer 2015). Though not very common a half-century ago, there has been an explosion of survey-based police research over the last few

decades. These studies have provided valuable insight about a wide variety of topics, including officer stress (Duxbury *et al.* 2015, Shane 2010), police culture (Ingram *et al.* 2013), the Ferguson effect (Nix and Pickett 2017, Wolfe and Nix 2016), body-worn cameras (Gaub *et al.* 2016, Jennings *et al.* 2014), utilization of research (Rojek *et al.* 2012, Telep 2017) and perceptions of citizens (Nix, Pickett, *et al.* 2017, Pickett and Ryon 2017) among others. Yet, given the increased utilization of survey methods for police researchers, it is somewhat surprising that research analyzing police survey methods is nonexistent.

As a result, we have no idea what should be considered a ‘good’ or even ‘acceptable’ response rate for a police survey. Our ability to identify best practices in terms of administering surveys to police samples has likewise been impeded by this dearth of research. Policing scholars typically use Dillman *et al.* (2014) as a guide, but findings such as those may not be directly applicable to police surveys, which come with a unique set of challenges (e.g., being granted ‘access’ to the officers, cynicism and distrust of researchers, and/or fear of the survey not being truly anonymous). The present study uncovered the average response rates for police surveys published in fifteen peer-reviewed journals over the last nine years – 64%. It is important to understand that this figure is affected by survey design features. Furthermore, we demonstrated empirically what factors are associated with higher response rates. We arrived at three key findings which warrant further discussion.

First, surveys administered in-person fared much better in terms of response rates than surveys administered through the mail, over the phone, or on the Internet. The average response rate to surveys administered in-person was 79.4 percent – versus just 48.6 percent for surveys distributed via other means. Even after controlling for other potentially important covariates in our multivariate models, face-to-face administration remained strongly associated with higher

response rates. Although less convenient and perhaps more time-consuming (e.g., requiring attending numerous roll-call meetings spread out over several days), researchers should be aware that the return on investment will likely make it worth their while.

Second, we observed that response rates are declining over time – a finding that was restricted to surveys administered via mail, phone, or Internet. There are two plausible explanations for this finding. Research suggests that non-contacts and refusals have increased over the last few decades – both of which reduce response rates. Non-face-to-face surveys, in particular, have seen an increase in non-contacts and refusals (Peytchev 2013). Also, Internet surveys typically achieve lower response rates than other non-face-to-face administration modes (e.g., mail, phone) – and these have become far more widespread in recent years. That in-person police surveys have not concurrently experienced a significant decline in response rates is promising, and it reiterates the appeal of surveying officers face-to-face.

Third, there was a significant inverse relationship between number of invitations sent and response rate. Our regression model demonstrated that each additional 100 officers invited to take a survey corresponded with about a one percent decline in response rate. Researchers undoubtedly want samples large enough to analyze statistically – but they may ultimately face a tradeoff between sample size and response rate. Larger sample sizes are important for increasing statistical power. Additionally, most police surveys are conducted with nonprobability samples. However, when relying on nonprobability samples, greater sample heterogeneity (e.g., recruiting officers from different agencies) is critical for reducing sampling bias and increasing generalizability of findings (Blair *et al.* 2014, Shadish *et al.* 2002). As Blair and colleagues (2014, p. 101) explain, in nonprobability samples, ‘measures of relationships should be resistant to sample bias as long as the sample is diverse but not necessarily if the sample is restricted.’

Therefore, it would likely be a mistake to restrict sampling for a police survey to a single agency, rather than multiple agencies in different areas, simply in hopes of maximizing the response rate.

Equally important as our findings, a number of non-findings were also worth noting. We were surprised at some of the difficulties we encountered while coding the articles in our sample. One hundred and twenty (24%) of our 497 surveys did not include readily apparent response rates. We were able to calculate the response rate for 43 of these surveys – but this left us with 77 surveys for which the response rate was unknown or unclear. Importantly, in some cases the authors noted that it was not possible to determine a response rate given their sampling strategy (e.g., requesting participation through email and asking participants to forward the email to colleagues). Other important methodological details were also commonly missing. One out of every three surveys failed to mention when the data were collected. One out of every four surveys did not indicate how many officers were invited to participate. And for approximately one out of every seven surveys, it was unclear how the survey was administered (i.e., whether in-person or by some other method). Finally, 12 of the 497 surveys in our sample involved an incentive of some sort – but while a few studies explicitly mentioned *not* offering any incentive, the overwhelming majority simply did not say.

It is important to note that our findings related to underreporting of certain survey design features are consistent with other areas of criminal justice research. Perry *et al.* (2010, p. 245), for example, evaluated the reporting transparency of experimental crime and justice studies and found that ‘reporting was poor on methods of randomization, outcome measures, statistical analyses, and study findings.’ Nevertheless, we find it troubling that such basic survey design information was so often left out of published articles. As such, we provide what we believe should be the minimally acceptable set of reporting standards below:

1. When the data were collected (from start to finish)
2. How/where the survey was administered
3. Whether incentives were offered
4. Whether/how many follow-ups there were
5. The size of the sampling frame
6. The number of officers invited to participate
7. What officers were told the survey was about
8. The number of surveys returned
9. The number of surveys excluded from subsequent analyses and the reason(s) why
10. The response rate – being clear about the numerator and denominator

Providing these details will better permit readers to assess the strengths and weaknesses of the survey methodology, and in turn, the results of the study.

Our study is not without its own limitations. We only looked at nine years of publications, and although this resulted in a sample of nearly 500 surveys collected over a twenty-year period, it is still only a fragment of all relevant publications. Relatedly, we only scanned fifteen peer-reviewed journals, which means we did not code studies published in dozens of other journals, or unpublished studies (including theses and dissertations). To this point, it is possible that the response rates in our sample are overestimates of response rates in the population of police surveys due to selection bias (i.e., researchers may be less likely to write up their studies when they achieve low response rates). We were furthermore limited to exploring the relationship between response rate and only a few general survey design characteristics, in part because, as we have noted, reporting was often incomplete. However, in the case of police surveys there are several other unique design issues that may be relevant and offer promising directions for future research. For instance, who is administering the survey – an agency, professional association, union representatives, or just curious academics? We captured whether the surveys were funded or not, but it may be more important to note who physically distributes the surveys (or whose name is on the cover letter). Another detail worth considering is

how the survey is presented to officers (i.e., what it is about). Is it possible that officers are less willing to respond to surveys that pertain to sensitive topics such as use of force or misconduct? Or alternatively, they may be more willing to respond to a survey that is about a topic they personally care about. Future studies would do well to investigate these possibilities, assuming reporting standards improve.

Another limitation of our study is that we restricted our analysis to response rates of police surveys. Future studies might consider going beyond our analysis by comparing, for example, police response rates to civilian response rates to surveys about the police. Perhaps there may be meaningful differences over time, across various administration modes, or even across journals. We furthermore did not assess response *quality* (e.g., satisficing, speeding, item nonresponse). Stylistic responding (e.g., response acquiescence) is common in surveys and reduces data quality (Pickett and Baker 2014). Likewise, even in surveys with high response rates, item nonresponse reduces analytic sample size and can bias findings. Future studies should thus consider what survey design features are associated with different measures of response quality. For example, Medway and Tourangeau (2015) found that \$5 incentives significantly decreased item nonresponse in telephone surveys. In the context of police surveys, it seems especially relevant to consider whether factors such as union sponsorship, the promise of anonymity, and/or the survey topic are related to reductions in, for example, acquiescent responding, speeding through the survey, and/or failing attention checks. Even when anonymity is promised, officers are often skeptical that their identities will not be revealed when answering demographic questions (especially those working for small departments). Research that can shed light on these issues would be a welcomed addition to the literature.

We conclude by reiterating that although our analysis indicated that the average response rate among police surveys published in the last decade was approximately 64 percent, there was an enormous amount of variation, with some published studies realizing a response rate under 10 percent. Yet, it bears repeating that research has demonstrated that low response rates are typically only weakly related to non-response bias. As such, a low response rate on its own is no reason to dismiss the findings of a survey. Given the weight of the evidence (Groves and Peytcheva 2008), the burden should be on manuscript referees to state why they believe a low response rate is suggestive of non-response bias. That is, referees should be required to identify explicitly patterns of over- or under-representation on some variable that is known to be related to the outcome. At the same time, it is incumbent upon researchers to be completely transparent about their survey methodology so that referees and readers can have a better idea *why* a response rate may be low – or high. It is our hope that the analyses we have presented will spark continued interest in police survey methodology, as police surveys are so important to our understanding of the profession.

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Police survey response rates by journal, 2008 – 2017.^a

	N	N that report RR	Mean RR	St. Dev.	Min	Max
Policing Journals						
International Journal of Police Science & Management	59	45	60.6	26.7	6.3	100.0
Journal of Police and Criminal Psychology	48	30	65.4	20.6	6.5	100.0
Police Practice & Research	67	56	64.8	24.9	5.9	100.0
Police Quarterly	67	61	66.0	22.4	12.4	98.3
Policing: A Journal of Policy and Practice	29	20	54.4	31.9	14.2	100.0
Policing: An International Journal	107	102	66.6	26.4	7.3	100.0
Policing & Society	56	50	56.1	26.1	7.3	100.0
Criminology Journals						
British Journal of Criminology	6	5	74.0	26.5	30.0	95.0
Crime & Delinquency	11	11	66.2	26.9	33.2	98.0
Criminal Justice and Behavior	16	12	71.8	29.8	21.3	98.4
Criminology	2	2	95.1	2.9	93.0	97.1
Journal of Criminal Justice	25	22	70.0	29.2	5.2	98.0
Journal of Quantitative Criminology	0	—	—	—	—	—
Journal of Research in Crime and Delinquency	0	—	—	—	—	—
Justice Quarterly	4	4	71.3	19.0	48.2	88.5
Total/Average	497	420	64.3	25.9	5.2	100.0

^a As of March 2017.

Table 2. Descriptive statistics.

Variable	N	Mean	S.D.	Min	Max
Response Rate	420	64.293	25.881	5.200	100
Survey Year	450	2008	4.266	1996	2016
In-person	421	.475	—	0	1
Invitations	364	644.225	699.030	10	2,574
Funded	497	.256	—	0	1
US Sample	497	.507	—	0	1
Incentive	497	.024	—	0	1
Crim Journal	497	.129	—	0	1
Sorenson	497	.122	.180	0	1.210

Table 3. OLS regression model predicting response rate.

Variable	Response Rate				
	<i>b</i>	Robust SE	95% CI		β
Survey Year	-.532*	.265	-1.054,	-.011	-.096
In-person	24.046**	2.661	18.807,	29.286	.467
Invitations	-.010**	.002	-.014,	-.005	-.261
Funded	.123	2.723	-5.238,	5.484	.002
US Sample	-.688	2.720	-6.042,	4.666	-.013
Crim Journal	5.373	3.715	-1.940,	12.686	.078
Sorenson	5.522	7.207	-8.668,	19.711	.042
<i>N</i>			279		
<i>R</i> ²			.423		
<i>F</i> -test			31.86***		

Entries are unstandardized partial regression coefficients (*b*), robust standard errors (SE), 95% confidence intervals (CI), and standardized partial regression coefficients (β). ** $p < .01$; * $p < .05$

Figure 1. Response rates by survey year, 1996 – 2016 (N = 450).

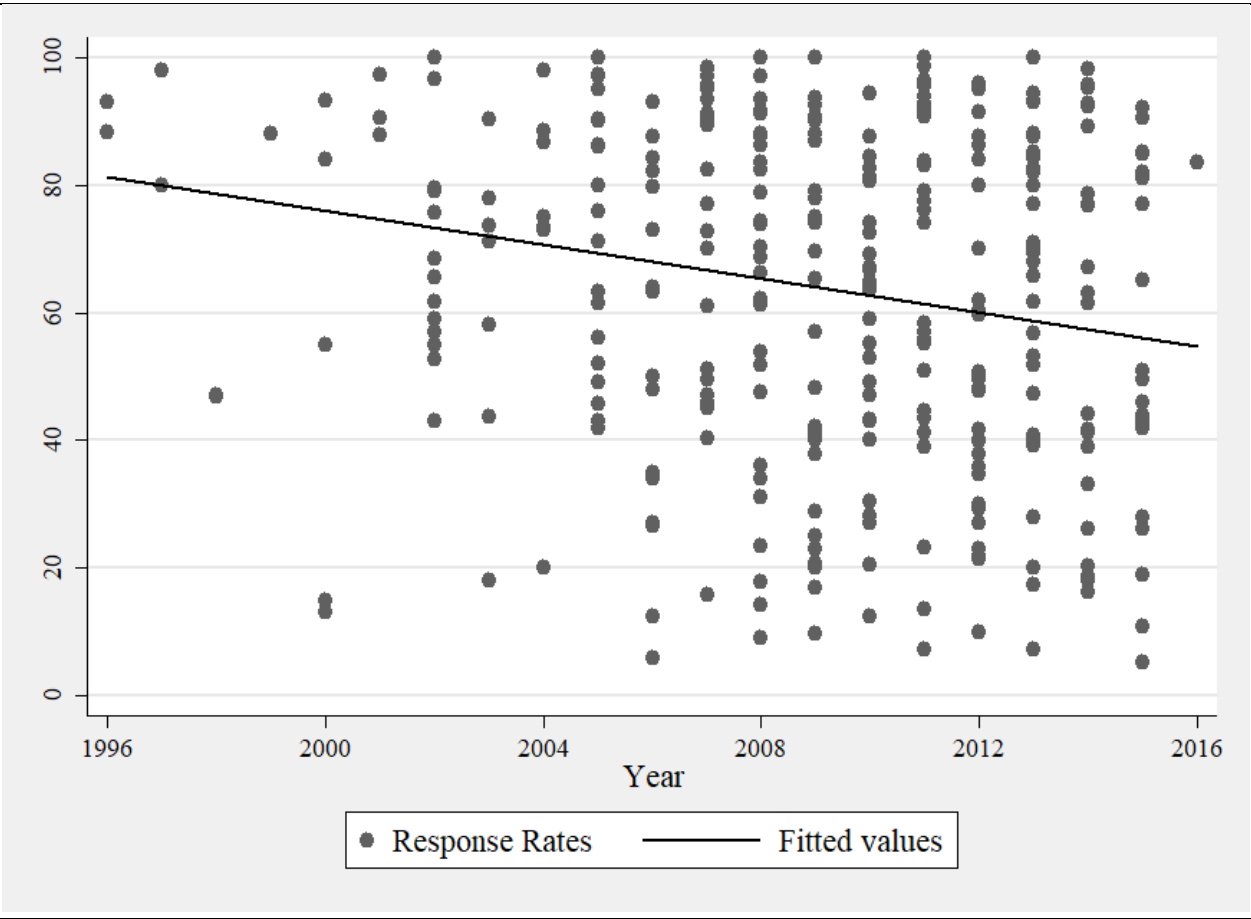


Figure 2. Administration modes (N = 421).

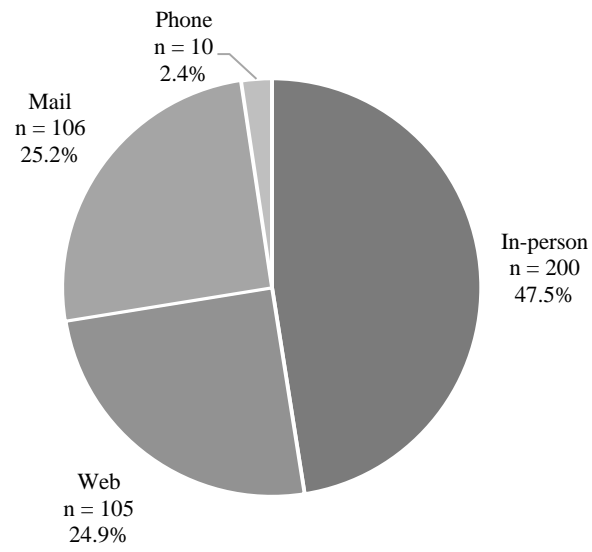
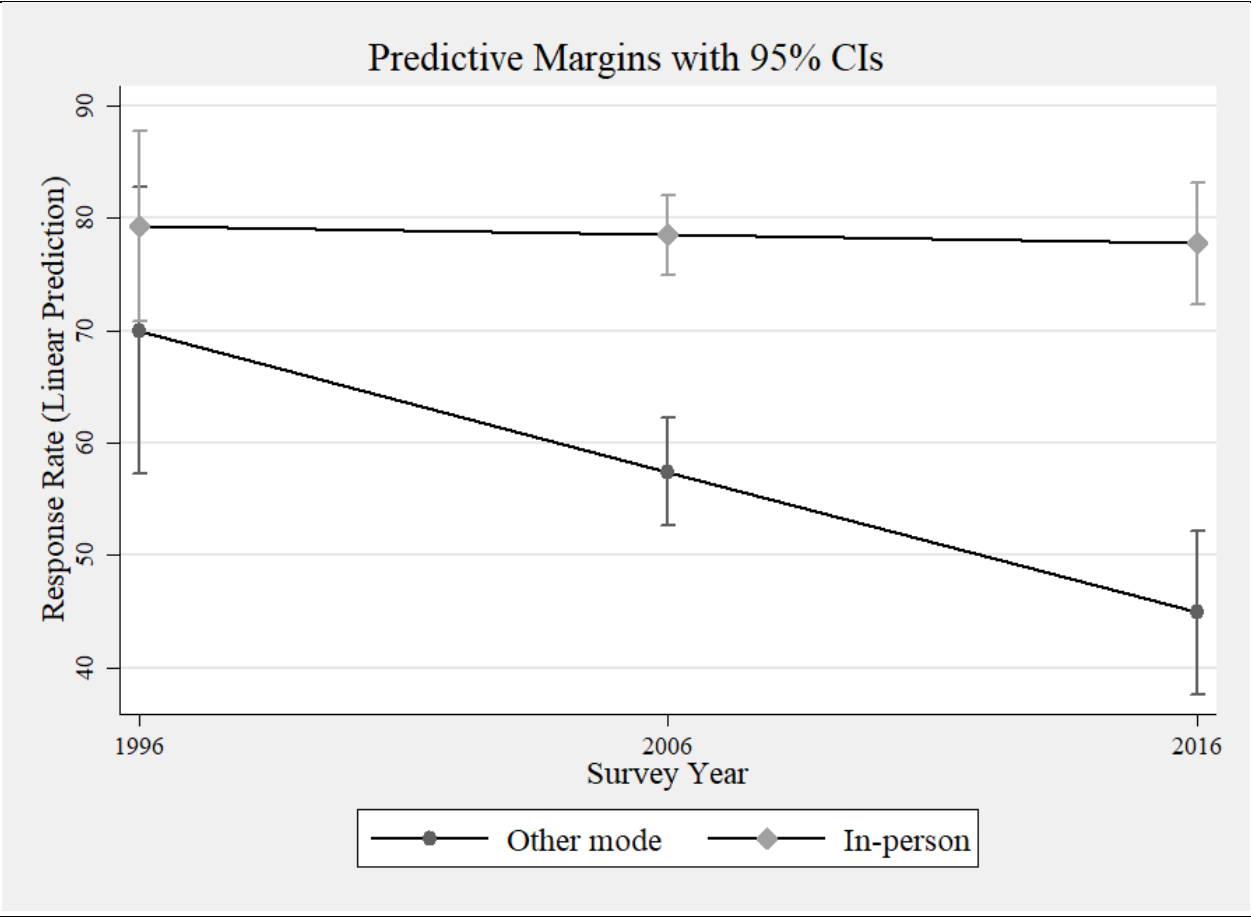


Figure 3. Interaction effect of administration mode and survey year on response rate.



Appendix: Studies Included in the Sample

Criminology Journals

British Journal of Criminology

Lum 2009
Bradford and Quinton 2014
Chu and Abdulla 2014
Jonathan-Zamir and Harpaz 2014
Brown 2016

Crime & Delinquency

Sobol *et al.* 2013
Chu and Sun 2014
Uluturk *et al.* 2014
Nix 2017a
Nix 2017b
Telep 2017

Criminal Justice and Behavior

Gershon *et al.* 2009
Adams and Buck 2010
Godfredson *et al.* 2010
Sleath and Bull 2012
Gau *et al.* 2013
Terrill and Paoline 2013
Allisey *et al.* 2014
Gracia *et al.* 2014
Duxbury *et al.* 2015
Donner *et al.* 2016
Johnson and LaFrance 2016
Karaffa and Koch 2016
Smith *et al.* 2016
Wolfe and Nix 2017

Criminology

Ingram *et al.* 2013
Markowitz and Watson 2015

Journal of Criminal Justice

Morash *et al.* 2008
Sun *et al.* 2008
De Angelis and Kupchik 2009
Miller *et al.* 2009
Gerber *et al.* 2010
Kim *et al.* 2010
Schafer 2010
Shane 2010
Sobol 2010
Sun *et al.* 2010
Sun and Chu 2010
White *et al.* 2010
Moon and Jonson 2012

Ingram and Terrill 2014

Jennings *et al.* 2014
Jennings *et al.* 2015
Nix and Wolfe 2016
Hine and Murphy 2017
Pickett and Ryon 2017

Justice Quarterly

Zalman *et al.* 2008
Eterno *et al.* 2016
Johnson and Dai 2016
Nix and Wolfe 2017

Policing Journals

International Journal of Police Science & Management

Addis and Stephens 2008
Foley *et al.* 2008
Jamel *et al.* 2008
Parker and Sarre 2008
Phillips 2008
Stephens and Pugmire 2008
Wilson *et al.* 2008
Aremu 2009
Ozel *et al.* 2009
Srivastava 2009
Wu *et al.* 2009
Andreescu and Vito 2010
Archbold *et al.* 2010
Chown 2010
Eterno and Silverman 2010
Gotschalk and Gudmundsen 2010
LaFrance and Allen 2010
LaFrance and Placide 2010
Marcum *et al.* 2010
Phillips *et al.* 2010
Vito and Higgins 2010
Wright 2010
Burrell and Bull 2011
Glomseth *et al.* 2011
Hassell *et al.* 2011
Julseth *et al.* 2011
LaFrance 2011
Leino *et al.* 2011
Pagon *et al.* 2011
Powell and Tomy 2011
Zengin *et al.* 2011
Fekjaer and Halrynjo 2012

LaFrance 2012

Lagestad 2012
Pinizzotto *et al.* 2012
Can *et al.* 2013
Khruakham and Lee 2013
Tewksbury and Mustaine 2013
Lagestad and Tillaar 2014
Natarajan 2014
Wixson *et al.* 2014
Fekjaer and Strype 2015
Karagoz *et al.* 2015
Lambert and Steinke 2015
Tewksbury and Copenhaver 2015
Bhowmick and Mulla 2016
Coon 2016
Kumarasamy *et al.* 2016
Lambert *et al.* 2016
Olugbemi and Bolaji 2016
Tewksbury and Copenhaver 2016
Wang and Leather 2016

Journal of Police and Criminal Psychology

Carlan and Nored 2008
Lindsay and Shelley 2009
Matsch *et al.* 2009
Payne and Guastaferro 2009
Prochniak 2009
Blandino *et al.* 2010
Dorta *et al.* 2010
Ghazinour *et al.* 2010
Johnson *et al.* 2010
Prati and Pietrantonio 2010
Carlan *et al.* 2011
Hogan *et al.* 2011
Rooy *et al.* 2011
Ali *et al.* 2012
Hyland *et al.* 2012
Sachau *et al.* 2012
Clark-Miller and Brady 2013
Chopko *et al.* 2014
Smith and Bull 2014
Johnson 2015
Sarapin and Sparks 2015
Arnten *et al.* 2016
Brady 2016
Brown and Daus 2016

- Can *et al.* 2016
 Chaplin and Shaw 2016
 Ellrich 2016
 Fyhn *et al.* 2016
 Hansson *et al.* 2016
 Jo and Lamb 2016
 Johnson 2016
 Padyab *et al.* 2016
 Roach *et al.* 2016
 Rogers *et al.* 2016
 Singh 2016
 Thornton and Herndon 2016
 Walsh *et al.* 2016
 White *et al.* 2016
 Young 2016
 Arble *et al.* 2017
 Carter *et al.* 2017
 Johnsen *et al.* 2017
 Patry *et al.* 2017
 Schaveling *et al.* 2017
- Police Practice & Research*
 Coleman 2008
 Jollevet II 2008
 Mon and Chu 2008
 Rosenberg *et al.* 2008
 Sever *et al.* 2008
 Steinheider and Wuestewald 2008
 Sun and Chu 2008
 Aremu and Lawal 2009
 Yim and Schafer 2009
 Buker 2010
 Frantzen 2010
 Gul *et al.* 2010
 Phillips 2010
 Correia and Jenks 2011
 Lasley *et al.* 2011
 Oschwald *et al.* 2011
 Perrott and Kelloway 2011
 Senjo 2011
 Bissett *et al.* 2012
 Chapman 2012
 Coon and Travis III 2012
 Grubb and Bennett 2012
 Rojek *et al.* 2012
 Steinheider *et al.* 2012
 Backteman-Erlanson *et al.* 2013
 Kankaanranta 2013
 Martin *et al.* 2013
 Shane 2013
- Skogan 2013
 Balmer *et al.* 2014
 Muftic and Collins 2014
 Pizio 2014
 Sundstrom and Wolming 2014
 Vuorensyrja 2014
 Howes and Goodman-Delahunty 2015
 Lobnikar and Meško 2015
 Oxburgh *et al.* 2015
 Phillips 2015
 Heffren and Hausdorf 2016
 Kelly and Hassett-Walker 2016
 McCarty and Lawrence 2016
 Schnobrich-Davis 2016
 Violanti *et al.* 2016
 Wolfe *et al.* 2016
 Back *et al.* 2017
 Johnson and Hunter 2017
 Kula 2017
 Lambert *et al.* 2017
 Steyn 2017
 Vito *et al.* 2017
 Wain *et al.* 2017
- Police Quarterly*
 Culhane *et al.* 2008
 Lindsay 2008
 Lord and Friday 2008
 Lyons *et al.* 2008
 Peak *et al.* 2008
 Zhao *et al.* 2008
 Carlan and Lewis 2009
 Chaiyavej and Morash 2009
 Colvin 2009
 Crank and Giacomazzi 2009
 Hassell and Brandl 2009
 Schafer *et al.* 2009
 Kenney *et al.* 2010
 Rydberg and Terrill 2010
 Schaible and Gecas 2010
 Tankebe 2010
 Thomas *et al.* 2010
 Cordner and Cordner 2011
 Stewart 2011
 Stroshine and Brandl 2011
 Darroch and Mazerolle 2012
 Ivkovic *et al.* 2012
 McCarty and Skogan 2012
 Rojek *et al.* 2012
- Terrill and Paoline 2012
 Wentz and Archbold 2012
 Chermak *et al.* 2013
 Kim *et al.* 2013
 Lonsway *et al.* 2013
 Farrell 2014
 Haynes and Giblin 2014
 Menard and Arter 2014
 Ross and Wright 2014
 Telep and Lum 2014
 Bates *et al.* 2015
 Bell *et al.* 2015
 Davis *et al.* 2015
 Mumford *et al.* 2015
 Rhodes 2015
 Blumberg *et al.* 2016
 Brinser and King 2016
 Carter 2016
 Gaub *et al.* 2016
 Morrow *et al.* 2016
 Schaible and Six 2016
 Kim *et al.* 2017
 Van Craen and Skogan 2017
- Policing: An International Journal*
 Huang and Cao 2008
 Liederbach *et al.* 2008
 Lindsay *et al.* 2008
 Nikels and Verma 2008
 Schafer and Martinell 2008
 Somvadee and Morash 2008
 Sun and Triplett 2008
 Talaga and Tucci 2008
 Aremu *et al.* 2009
 Gorenak and Gorenak 2009
 Ivkovich 2009
 Johnson 2009
 Kury *et al.* 2009
 Noblet *et al.* 2009
 Sun *et al.* 2009
 Cohen and Shamai 2010
 Ivkovich and Shelly 2010
 Lee *et al.* 2010
 Ralston and Chadwick 2010
 Sobol 2010
 Cheong and Yun 2011
 Dodge *et al.* 2011
 Lee and Moon 2011
 Lee and Lee 2011
 Nalla and Kang 2011

Salo and Allwood 2011
 Vuorensyrja and Malkia 2011
 Blumenstein *et al.* 2012
 Bossler and Holt 2012
 Crow *et al.* 2012
 Davis 2012
 Hill *et al.* 2012
 Houdmont *et al.* 2012
 Hsieh *et al.* 2012
 Ivkovich and Kang 2012
 Kai-ting 2012
 Lee and Jang 2012
 Phillips and Sobol 2012
 Yang *et al.* 2012
 Ivkovich and Sauerma 2013
 Ivkovich and Khechumyan 2013
 Kim *et al.* 2013
 Maccary 2013
 Meyer *et al.* 2013
 Phillips and Terrell-Orr 2013
 Staines 2013
 Yun *et al.* 2013
 Alderden and Skogan 2014
 Basinska *et al.* 2014
 Chen *et al.* 2014
 Chu and Tsao 2014
 Fekjær 2014
 Indrayanto *et al.* 2014
 Ingram *et al.* 2014
 Lee and Yun 2014
 Ratcliffe *et al.* 2014
 Sarver and Miller 2014
 Swid 2014
 Tyagi and Dhar 2014
 Annell *et al.* 2015
 Bouranta *et al.* 2015
 Chrusciel *et al.* 2015
 Colvin 2015
 Cuvelier *et al.* 2015
 Davies and Dawson 2015
 Davis *et al.* 2015
 Donnelly *et al.* 2015
 Garcia-Buades *et al.* 2015
 Gardiner 2015
 Guclu and Can 2015
 Hansen *et al.* 2015
 Masal 2015
 Shingh and Nayak 2015
 Tiesman *et al.* 2015
 Can *et al.* 2016
 Chen 2016
 Donner *et al.* 2016
 Eadens *et al.* 2016
 Ellrich 2016
 Gelderen and Bik 2016
 Hickman *et al.* 2016
 Johnson and Hansen 2016
 Ivkovic, Habarfeld, *et al.* 2016
 Ivkovic, Mraovic, *et al.* 2016
 Ivkovic and Sauerma 2016
 Lim and Sloan 2016
 Lobnikar *et al.* 2016
 Messing *et al.* 2016
 Pelfrey and Keener 2016
 Shernock 2016
 Sun *et al.* 2016
 Vallmur 2016
Policing & Society
 Alain and Gregoire 2008
 Ivkovic and Shelley 2008
 Strobl and Sung 2009
 Abrahamsen and Strype 2010
 Craig *et al.* 2010
 Den Heyer 2010
 Mawby 2010
 Mitchell *et al.* 2010
 Millen and Stephens 2011
 Parsons *et al.* 2011
 Tankebe 2011
 Herrington and Pope 2014
 Carter and Grommon 2015
 Carter and Phillips 2015
 Darroch and Mazerolle 2015
 Dormaels 2015
 Herrington 2015
 Ivkovic and Sauerma 2015
 Jones and Williams 2015
 Davies and Dawson 2016
 Ellrich 2016
 Fleischmann *et al.* 2016
 Matusiak 2016
 Miles-Johnson *et al.* 2016
 Nalla *et al.* 2016
 Noppe 2016
 Ratcliffe 2016
 Robinson *et al.* 2016
 Rotenberg *et al.* 2016
 Terpstra 2016
 Westmarland and Rowe 2016
 Fildes *et al.* 2017
 Kidrowski *et al.* 2017
Policing: A Journal of Policy and Practice
 Marcum *et al.* 2011
 Herrington 2012
 Millen and Stephens 2012
 Oehme *et al.* 2012
 Hobson *et al.* 2013
 Lauritz *et al.* 2013
 Walsh *et al.* 2013
 Koper *et al.* 2014
 Korre *et al.* 2014
 Young *et al.* 2014
 Can *et al.* 2015
 Guilfoyle 2015
 Hesketh *et al.* 2015
 Jones 2015
 Smith and Greene 2015
 Boag-Munroe *et al.* 2016
 Hesketh *et al.* 2016
 McLeod and Herrington 2016
 Phelps *et al.* 2016
 Telep and Winegar 2016
 Tyagi and Dhar 2016