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Enforcement Officials' Coping Strategies in a Changing Regulatory Environment

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Abstract

Enforcement officials' coping strategies evolve with changes in job attitudes, work situations, and institutional support. As the institutional context becomes more challenging with stronger performance management and transparency pressures, enforcement officials are less likely to move *toward* regulatees. Besides, in a more challenging context, officials with higher pay satisfaction and societal support are more likely to move *toward* regulatees. Yet officials are consistently less likely to move *toward* regulatees if they receive fewer resources or more government support. These correlations are supported by results from two rounds of surveys with environmental regulatory enforcement officials in China. Our interviews and archival documents helped unearth changes in institutional contexts and enforcement activities between and after our two surveys. This study advances a dynamic view of coping among street-level bureaucrats by showing how changes in institutional contexts may reshape the motivational bases of coping strategies.

Keywords: coping behaviour, street-level bureaucracy, regulatory enforcement, China

Enforcement Officials' Coping Strategies in a Changing Regulatory Environment

When implementing public policies and delivering social services, frontline law enforcement officials often work in a complex environment with changing enforcement situations and adversarial stakeholder relationships. Since Lipsky's classic work (1980), many scholars have examined how street-level bureaucrats cope with the challenges of frontline work (Fowler forthcoming; Garrow and Grusky 2013; Hupe 2019; Keiser 2010; van Loon and Jakobsen 2018). Tummers et al. (2015) recently developed a more precise and coherent framework for analysing coping in public service delivery. They define coping as behavioural efforts used by frontline workers to interact with clients in an attempt to '*master, tolerate, or reduce external and internal demands and conflicts they face on an everyday basis*' (p. 1100). They also identified three types of coping, distinguished by the extent to which frontline workers are moving toward, against, or away from clients.

The existing literature not only takes stock of what types of coping dominate in what professional groups in public service delivery but also highlights significant gaps in the public administration literature. One major gap, in particular, is our limited understanding of how coping and its antecedents may evolve in a rapidly changing environment. Works in sociology and psychology have emphasised the role of workplace context, role conflicts, and personality traits in affecting the choice of coping strategies outside public service delivery (Folkman and Moskowitz 2000). Existing studies in public administration have also examined how individual factors and organisational attributes affect coping among frontline professionals (Fleming 2019; Schott et al. 2016; Tummers et al. 2015). Few studies have examined how these antecedents may vary due to emergent trends in the 21st century, such as performance management and transparency pressures (van Loon and Jakobsen 2018).

This paper addresses these gaps by studying changes in coping strategies among local environmental law enforcement officials in China, using data from two rounds of surveys, one conducted in 2000 and the other in 2014. We also drew on in-depth interviews conducted in 2006 and 2017, and rich archival data documenting both changes in institutional contexts and enforcement activities between and after our two surveys. What makes our empirical analyses especially valuable is that the institutional context faced by frontline enforcement officials in China had changed significantly between the times of the two surveys—with the institutional environment becoming increasingly adversarial. In more recent years, frontline officials had faced greater chances of being challenged by either outside stakeholders or their administrative superiors. These institutional changes allow us to observe how coping strategy and its antecedents evolve over time. Results from our surveys show that, in both 2000 and 2014, street-level enforcement officials were more likely to move *against* regulatees if they perceived higher resource scarcity and government support. In 2000, officials with stronger organizational identification were more likely to move *toward* regulatees. In 2014, officials were more likely to move *toward* regulatees if they were more satisfied with their pay and perceived stronger societal support.

In the rest of this paper, we first discuss the theory, research context, and hypotheses. This is followed by a discussion of the research method and findings. We conclude by discussing theoretical contributions and policy implications.

Theory, Research Context, and Hypotheses

Coping has long been a concept for understanding how individuals handle psychological stress through cognitive or behavioural means (Lazarus 1993). When applied to workplaces in public service delivery, the concept is usually framed as exercising discretion in patterned ways in

frontline workers' daily encounters with clients (Baviskar and Winter 2017; Bovens and Zouridis 2002; Evans 2013). For example, Tummers et al. (2015) distinguish among three broad categories of coping: moving *toward*, moving *away*, and moving *against* clients. Moving *toward* involves officials bending and sometimes breaking rules to help clients. Moving *away* involves officials avoiding meaningful contacts with clients. Moving *against* involves officials applying rules rigidly on clients. The literature has also differentiated between the state-agent and the client-agent narratives (Gassner and Gofen 2018; Maynard-Moody and Musheno 2000, 2003). The former highlights the institutional logic that street-level bureaucrats' discretion should be limited to ensure legality and fairness. By contrast, the latter emphasizes how street-level bureaucrats do their work by following normative and cultural norms. Both narratives can be used to understand how individual, organizational, professional, and institutional factors affect coping strategies (Keiser 2010; Tummers et al. 2015).

While the concept of coping has been widely used to study social workers, teachers, and healthcare professionals, it can also be applied to study the discretions exercised by police officers and regulatory enforcement officials (Nielsen 2006). Unlike their healthcare and social service counterparts, regulatory enforcement officials do not usually serve or benefit regulatees directly. Instead, they are responsible for ensuring that regulatees conform to government regulations. They must also exercise discretion during enforcement by adopting different enforcement styles such as setting priorities (Bardach and Kagan 1982) and being responsive to different constituencies (Nielsen and Parker 2009; Scholz 1991).

The concept of coping provides an alternative perspective for understanding regulatory enforcement as frontline officials deal with stress arising from their situational and institutional circumstances. This study focuses on officials' location on a one-dimensional scale ranging from

moving completely *toward* regulated enterprises to moving completely *against* them. Enforcement officials move *toward* regulatees by providing precise and useful guidance to help enterprises comply and by considering each regulatee's unique circumstances (e.g., financial conditions, technological capacity, cooperative attitudes, etc.). These efforts are similar to what the responsive regulation literature describes as an interactive process in which enforcers engage regulatees in providing extra communication and support while capable of resorting to the big stick when compliance is not forthcoming (Ayres and Braithwaite 1992; Nielsen and Parker 2009). By contrast, officials move *against* regulatees by adopting a strict, rigid, and uncompromising stance toward the regulatees. Moving *away* is not a critical coping strategy in our research setting. Unlike what officials can do in rationing public services to recipients, enforcement officials have relatively few choices in whether to interact with regulatees and polluters.[1]

In social service delivery, moving *toward* clients often signifies frontline workers' commitment to enhancing their clients' welfare despite situational and institutional pressures (Henderson 2013); moving *against* clients, on the other hand, often signifies a capitulation to situational and institutional pressures despite adverse effects on clients. In law enforcement, however, moving *toward* regulatees may not necessarily promote social welfare by improving compliance. For example, responsive regulatory techniques may reduce long-term compliance and induce more corporate lobbying when law enforcement lacks political support (Parker 2006). In countries characterized by the weak rule of law, close relationships between officials and regulateees can easily breed corruption (Yee et al. 2016). Instead, moving *against* regulatees may be a way for enforcement officials to enforce regulations faithfully. Yet rigid and coercive

[1] Though lax enforcement still exits, we can hardly capture it through survey questions.

enforcement may not be the most effective approach due to limited resources for deterring compliance evasion. Individual cases may vary as to whether moving *toward* or moving *against* regulatees is more conducive to regulatory compliance and social welfare.

We examine factors that explain the coping behaviour among local environmental enforcement officials in Guangzhou, China, over time (between 2000 and 2014). In China, enforcing environmental regulations is mostly the responsibility of street-level teams affiliated with the environmental protection bureaus (EPBs) at the city level and below. These frontline officials work in highly stressful circumstances. In Guangzhou, with a population of over 10 million, only two to three hundred officials are responsible for enforcing all types of environmental regulations. These officials have limited administrative resources and face limited career advancement opportunities. They also face pressures from a wide array of stakeholders—political leaders concerned about economic growth, citizens who complain about pollution, and administrative supervisors and higher-level officials who hold them accountable for failures in handling citizen complaints.

An enforcement team (each with around 20 officials) belongs to the municipal EPB or one of eleven subordinate district-level EPBs. Enforcement officials came from different backgrounds: some joined the team as military veterans with no related experience; some joined the team through open recruitment and came with a related educational background. They thus differ considerably from each other in work values, methods, and expertise, as can be expected following Maynard-Moody and Musheno's (2003) argument on identity diversification and street-worker behaviours. Enforcement officials in different districts also face diverse work situations. Some are located in economically more prosperous areas than others; some have more

polluting industries than others; some have more administrative resources than others; some have more or less supportive leaders.

Guangzhou is an excellent window to examine the dynamics of coping among street-level enforcement officials. As one of China's most developed regions, the city is also the front runner in the nation's effort to tighten environmental regulation and enforcement. In the past two decades, government leaders had become more attentive to environmental protection and sustainability. For instance, the city took the lead in implementing the environmental protection target responsibility system since the 1990s. In the 2010s, it adopted measures to hold party and government leaders accountable for damages to the ecological environment. Enforcement officials were also subject to a more stringent accountability system. The EPB's staff establishment had shrunk from 639 in 2011 to 501 in 2017, while citizen complaints had skyrocketed from around 5,200 to 38,000 (see figure 1). Team leaders faced sanctions—from disciplinary warning, pay reduction, firing, or even criminal punishment—for failing to meet accountability requirements. While they considered some of these complaints as groundless, frivolous, or beyond their jurisdiction, they found it difficult to resolve many of them to the complaints' satisfaction. Such transformations in environmental governance have been prevalent in China (Liu et al. 2015; Marquis and Bird 2018; van Rooij 2006), with the Guangzhou case providing a rich setting for assessing how the relationships between coping behaviour and various personal and situational factors change over time.

[Figure 1 here]

Hypothesis Development

In developing the hypotheses, we integrate the traditional street-level bureaucracy literature that emphasizes coping as a means to mitigate the negative aspects of work (Lipsky 1980) with perspectives that highlight the linkage between positive motivations and coping (Nielsen 2006).

Specifically, moving *toward* requires additional efforts in terms of extra attention, energy, time, and resources to understand the needs of the regulatees. For instance, officials need to be patient and persistent in persuading those who intend to evade enforcement, tailor enforcement to suit each enterprise's circumstances, or sort out promising ones that deserve extra help (Braithwaite 2006; Tummers 2016). We draw on two literature streams to explain such extra-role behaviours by focusing on enforcement officials' intrinsic and extrinsic motivations. Meta-analyses have shown that employees' organisational identification encourages such extra-role behaviours as volunteering extra hours and adopting altruistic practices (Riketta 2002). Research in the public and non-profit sectors generate similar insights. Dukerich et al. (2002) found that in the non-profit sector, physicians' identification with the health care system enhances their willingness to engage in extra-role behaviour to support the system. Other studies have highlighted how such extrinsic rewards as payment and compensation can explain employees' extra-role behaviour (Somech and Drach-Zahavy 2000). Su (forthcoming) showed that budget cuts may lead to pay-freezes and other austerity measures, resulting in stricter traffic enforcement and more frequent impositions of traffic fines by sheriff deputies. In line with these insights, we posit that enforcement officials who hold more positive attitudes toward their job and work environment will be more willing to take the extra efforts to help regulated enterprises.

H1a. Enforcement officials with greater organisational identification are more likely to move toward regulatees.

H1b. Enforcement officials with greater pay satisfaction are more likely to move toward regulatees.

Negative aspects of their work situation may lead frontline officials to move against clients. Equipped with legal authority, enforcement officials need little extra resources to enforce rules indiscriminately and follow their prescribed role requirements. The incentive to do so is incredibly strong when they possess limited resources and face rigid administrative supervision. Unlike the above-mentioned attitudinal factors that explain enforcement officials' willingness to devote additional efforts in dealing with regulatees, resource scarcity undermines their ability to go the extra mile. Apart from resource endowment, frontline officials' perception of policy alienation, a psychological state of feeling disconnected from the policy, also affects how they cope with clients (Thomann et al. 2018). Tummers et al. (2009) operationalise the concept along five dimensions: strategic powerlessness, tactical powerlessness, operational powerlessness, societal meaninglessness, and client meaninglessness. In the present study, we focus on *operational powerlessness,* which is particularly relevant to environmental regulation enforcement since frontline officials have limited freedom in deciding the form, quantity, and quality of enforcement and sanctioning. In local EPBs, enforcement plan is usually formulated on an annual basis, with determination of sanctions regulated by the *Discretion in Environmental Administrative Punishment promulgated in 1999 and related local guidance.*

A fatalism perspective may help explain street-level bureaucrats' coping behaviour: Enforcement officials with a stronger fatalistic feeling of powerlessness, i.e., perception of having less autonomy, tend to exhibit a lower level of work engagement and are less likely to help clients (Entwistle et al. 2016; Lipsky 1980; Lodge 2009). This is especially the case in work situations with a rigorous control system, in which employees can hardly initiate changes against

the cause of powerlessness (Ashforth 1989). Moreover, enforcement officials may also experience a sense of powerlessness originating from greater efforts to handle ever-increasing citizen demands and expectations. On the one hand, the need for these extra efforts may lead enforcement officials to move against regulatees. On the other hand, officials may seek to work more closely with regulatees to address citizen demands and expectations, especially if their performance evaluation becomes more heavily based on citizen satisfaction. Given these contingencies, it is uncertain how operational powerlessness may correlate with coping strategies. Here we tentatively hypothesize that operational powerlessness is positively associated with moving-against strategies. We will further discuss the potentially mixed influences of powerlessness in the empirical investigation by comparing the two surveys.

H2a. Enforcement officials who perceive greater resource scarcity are more likely to move against regulatees.

H2b. Enforcement officials who perceive greater operational powerlessness are more likely to move against regulatees.

The literature has long documented the profound impact of support from external constituencies on effective regulatory enforcement. Despite the growing evidence on how support from state and non-state actors may affect enforcement outcomes, few studies have explicitly examined how it shapes the way enforcers cope with stressful work. In general, when external constituencies are more supportive, enforcement officials feel more empowered to get their job done flexibly, without the fear of being challenged. Yet, in some circumstances, external support may create an opposite effect. For example, when a higher-level government provides unprecedented authority and resources to street-level teams in an *ad-hoc* pollution

control campaign (Liu et al. 2015), the 'state-agent' narrative is strengthened (Maynard-Moody and Musheno 2000, 2003). As such, enforcement officials are expected to adhere to rules strictly to achieve short-term regulatory targets. Zang and Musheno's (2017) recent study of civil law enforcement officials suggests that frontline enforcers facing upward accountability are less likely to bend or break the rules. In particular, when specific performance targets increasingly accompany government support, officials tend to focus more on rigid regulation enforcement by issuing more firm violations and more severe penalties (van Rooij 2006).

The regulatory enforcement literature has suggested supportive societal entities to be important allies of environmental enforcement agencies (Anderson et al. 2019; Lo and Fryxell 2005). Societal support could be in various forms, ranging from increased environmental awareness of citizens and heightened public attention to policy issues, coproduction of regulatory enforcement via active detection and reporting of pollution cases, and organized efforts to stimulate state responses and actions (Tilt 2007; Zhan and Tang 2016). When citizens support environmental protection, enforcement officials may feel inspired and empowered to move against regulated enterprises more rigorously. Yet, when the public are dissatisfied with the current environmental condition, their support may manifest as civic activism, including rising concerns, complaints, and appeals (Marquis and Bird 2018; Tilt 2007). Facing public scrutiny on regulatory enforcement, frontline officials may forgo a client-centered approach that demands more responsiveness to each regulatee. For example, they are likely to be less willing to negotiate with enterprises on the amount of penalty before imposing sanctions or allowing flexibility to make corrections.

H3a. Enforcement officials who perceive more governmental support are more likely to move against regulatees.

H3b. Enforcement officials who perceive more societal support are more likely to move against regulatees.

METHODS

We conducted two rounds of surveys with enforcement team members in Guangzhou in 2000 and 2014. Both surveys were supported by the Guangzhou Research Institute of Environmental Protection (GRIEP), which is a service organisation affiliated with the municipal EPB. We obtained over 70 percent response rates in both surveys, with 175 valid responses in the former and 207 in the latter. In the 2014 survey, about 16% of the responding enforcement officials had worked more than eight years in the department. As such, only a small number of the respondents could be working for the organization in both surveys. With nearly identical formats, the two surveys used similar questions on respondents' backgrounds, their views on the environment, their assessment of their work and organizational situations, and their enforcement approaches. Respondents were guaranteed that the survey was anonymous and for pure research purposes.

With the support of the GRIEP, we conducted two rounds of interviews with enforcement team leaders in the Guangzhou EPB and its subordinate offices in all its eleven districts, one in 2006 and the other in 2017. In both rounds of interviews, we asked questions regarding their teams' major responsibilities, their work situations, their approaches to enforcement, their work difficulties, and significant changes in their internal and external environments in the past decade. At least two research team members attended each interview, which lasted about one to two hours. Two members of the research team, one participating in the majority of the interviews and one not at all, analysed the interview data separately. Discrepancies were resolved by discussions involving other authors to increase the understanding and usefulness of interview

results. These interviews, together with the plentiful archival data of local EPBs, were used to illustrate the institutional and enforcement dynamics between our two surveys and also to assess the trend afterward.

Since our research consists of multiple rounds of data collection in a relatively long study frame (see the timeline in Figure 2), several major institutional changes and critical events prior to our surveys and interviews should be noticed. First, in March 2010, the Ministry of Environmental Protection amended the *Environmental Administrative Penalty Measures*, together with the promulgation of the *Several Opinions on Regulating the Discretion in Environmental Administrative Punishment*. In response to the central directive, the Guangzhou EPB promulgated two provisions of *Regulating the Discretion in Environmental Administrative Punishment* in April 2014 (before our second survey) and March 2016, respectively.[2] Both provisions clarified the situations under which administrative penalties and the magnitude would be determined. Hence enforcement officials bear more burden in justifying an enforcement decision: their exercise of discretions must be based on "solid and well-documented evidence and consider factors such as the non-compliance causes, situations, and degree of social harm when imposing administrative penalties."

[Figure 2 here]

Second, the central government launched the National Environmental Model City (NEMC) scheme in 1996 as a major national effort to heighten local environmental protection efforts (Liu forthcoming). In 1999 (before our first survey), Guangzhou was the first megacity to pledge better environmental performance in joining the scheme. Under the "model creation"

[2] Source: http://www.gz.gov.cn/gfxwj/sbmgfxwj/gzssthjj/content/post_5487721.html, accessed on November 2, 2020.

goal, the city demanded more stringent enforcement actions as it underperformed in five out of 28 assessment indicators. Our first round of interviews was conducted right before the city passed the examination to attain the NEMC status in Dec 2006 (right after our first round of interviews).

The third institutional change is pertinent to our interviews conducted from January to May, 2017. In 2016, the central government launched its own environmental inspection team, which completed the first round of inspecting all provinces by the end of 2017. During 28 November–28 December 2016, one month before our second-round interviews, the inspection team headed by ministerial-level officials stationed in Guangdong to oversee local enforcement of environmental regulations. The party secretary of Guangzhou reported the city's performance to the central inspection team on 30 November. These unprecedented efforts led to increased use of moving-against tactics by enforcement officials. From 29 November to mid-December, local EPBs in the province fined over 800 non-complying enterprises and received over 1,600 environmental cases forwarded by the central inspection team.[3]

Measurement

Our key variables were measured on a 5-point Likert scale to capture respondents' agreement or disagreement with the items. Table 1 presents the measurement details.

[Table 1 here]

[3] Source: Department of Ecology and Environment of Guangdong Province http://gdee.gd.gov.cn/dcdt/content/post_2351509.html, accessed on 2 November 2020.

Dependent variables. *Moving toward* regulated enterprises was captured by three items that measure the extent to which enforcement officials consider enterprises' attitudes and compliance capability when making enforcement actions (Nielsen 2006). We used four items to capture *moving against* regulated enterprises, focusing on the extent to which enforcement officials emphasise rigid rule-following (Tummers et al. 2016). We then reversed the coding of these four items by assigning "-5" to strongly agree, "-4" to mildly agree, "-3" to average, "-2" to mildly disagree, and "-1" to strongly disagree, to measure the officials' inclination to moving against, while maintaining the scores for moving forward. Finally, we aggregated all the scores to measure an official's location in the one-dimensional space ranging from "-5" to "5" such that "-5" represents completely moving against, while "5" represents completely moving toward. The Cronbach's alphas were 0.77 and 0.65 in the 2000 and 2014 surveys, respectively.

Independent Variables. As highlighted in our hypotheses, three sets of factors may explain enforcement officials' coping behaviour. The first set concerns positive attitudes toward job and organisation, captured by two variables. We first used two items to capture officials' *pay satisfaction*, with Cronbach's alphas of 0.86 and 0.93 in the two surveys. Following the literature (Riketta 2002), we measured *organisational identification* with three items, with Cronbach's alphas of 0.87 and 0.78 in the two surveys.

The second set includes factors related to perception of work situation constraints. *Resource scarcity* was measured by a single item that asks respondents to indicate their agreement to the statement, 'There is a lack of resources in my organisation to conduct enforcement.' We measured officials' perceived *operational powerlessness* with a single item, 'There is a lack of discretion power in my job.' This item highlights officials' perceived lack of influence on enforcement decisions.

The third set consists of two key elements of institutional influence. Regarding government stakeholder influence, we assessed respondents' perceptions of support from the municipal government and city mayor. We then assessed perceived support from societal stakeholders using four items. The Cronbach's alphas were 0.87 (2000 survey) and 0.97 (2014 survey) for government support and 0.93 (both surveys) for societal support, respectively.

Controls. We included the respondent's gender ("1" for males, and "0" for females), educational level, and educational background match to control for personal factors. We included years of work in the enforcement team, which may reflect the officials' experience in interacting with regulatees and their confidence in self-judgment (Assadi and Lundin 2018). We also included officials' perception of *procedural ambiguity,* which is measured by three items (i.e., unclear instructions and rules in my job, too many instructions and rules in my job, and conflicting instructions and regulations in my job). At the team level, we included a dummy variable to differentiate the municipal enforcement team under the direct supervision of the municipal EPB from district teams that operated within district EPBs.

ANALYSES AND RESULTS

Results from the Two Surveys

We conducted an analysis of variance to examine how the key variables changed in the two surveys. As shown in Table 1, enforcement officials had in general, moved against regulatees more in 2014 than in 2000. Compared to those in 2000, enforcement officials in 2014 also reported lower pay satisfaction, organizational identification, resource sufficiency, discretionary

power, and support from both the government and societal groups. Table 2 displays the descriptive statistics and correlations.

[Table 2 here]

Table 3 presents the results of multiple regression models. Four regressions were run with the 2000 and 2014 survey data. Columns 1 and 3 include control variables only. The full models were presented in columns 2 and 4. First, several control variables are significantly related to enforcement officials' coping behaviour. Frontline officials were more likely to move toward regulated enterprises if they worked in the district-level (rather than the municipal-level) enforcement teams, had lower educational levels, and had worked fewer years in the team.

[Table 3 here]

Second, the three sets of hypotheses are largely supported. But there are variations in details. Both surveys show perceived resource scarcity and government support as factors moving frontline officials against regulated enterprises. Other results show the effects of emerging challenges. In 2000, operational powerlessness during enforcement was not a significant organisational factor. Yet in 2014, it became a significant factor associated with moving toward regulatees ($\beta = 0.15$; $p < 0.001$), contradicting Hypothesis 2b. What explains the opposite empirical result in 2014? A possible explanation relates to two contradictory sources of powerlessness—one related to the loss of operational autonomy resulting from new regulatory constraints and the other related to the perceived challenge of dealing with a spike in citizen complaints. As we discussed earlier, autonomy loss due to regulatory constraints may induce enforcement officials to be less engaged in work and less willing to help regulatees. The challenge of coping with a spike in citizen complaints, on the other hand, may induce officials to

work more proactively with enterprises to find solutions to citizen complaints. This latter effect may have been in place during our 2014 survey, especially given that citizen satisfaction became a key criterion in evaluating official performance at the time.

The types of attitudinal factors that matter also changed: in 2000, officials' organisational identification (but not pay satisfaction) was positively related to a moving toward behaviour (β = 0.28; $p < 0.001$), whereas in 2014, pay satisfaction (but not organisational identification) was a positive factor ($\beta = 0.1$; $p < 0.01$). The effects of different types of institutional support also vary across the two surveys. In both 2000 and 2014, government support was associated with moving against regulatees. In 2014 (but not 2000), however, societal support was associated with moving toward regulatees ($\beta = 0.11$; $p < 0.01$). This finding contradicts Hypothesis 3b, which suggests that societal support is correlated with moving *against* regulatees. Perhaps in the 2014 survey when citizens' demands for resolving specific problems were more diverse, enforcement officials might have undertaken extra-role activities to meet resident demands.

We conducted two sensitivity analyses to test the results' robustness. First, we excluded the municipal team from the sample, with 279 officials working in district bureau teams remaining in the analysis. The findings, presented in columns 1 and 2 in Table A1 (see Appendix), are consistent with those shown earlier. Second, we reran the analyses by controlling respondents' perception of supervisor support and the role of government (i.e., government should invest more money on the environment; new taxes can be used on the environment; government should reduce infrastructure for more spending on the environment). As presented in columns 3 and 4 in Table A1, these results are consistent with those of our main analyses.

Insights from Archival and Interview Data

To assess how frontline-officials' coping behaviour and perceptions of institutional and organisational factors changed over time, we drew on archival documents (e.g., Guangzhou Environmental Protection Yearbook 2005-2016, Year-end Summary of Environmental Protection in Guangzhou 2005-2017) and two waves of interviews conducted with enforcement officials in 2006 and 2017. The 2017 interviews also enable us to detect the trend after the 2014 survey. Taken together, insights from these qualitative data deepen our understanding of changes in institutional contexts and how enforcement officials have adjusted their coping strategies over a relatively long period of time.

First, our interviews yield new insights into the team-level divergence in their coping strategies as it related to local economy. Our 2017 interviews show that local economic development empowered the enforcement team with improved technical capacity leading to more rigid enforcement. Meanwhile, many respondents agreed that enforcement teams in districts with a more industry-driven economy usually enjoy much higher salaries. The overarching policy in these districts favours industrial development and allows for more leeway for enterprises in regulatory compliance. The enforcement team director of District K, for example, suggested that "the fundamental government policy is to do everything to serve enterprises' very interests" and "since our enforcement is based on the premise of giving companies full opportunities for correction, we take multiple factors into consideration to make a comprehensive judgment." Both surveys were unable to capture such impacts from local economic differences as we did not ask respondents to identify their respective enforcement teams to ensure anonymity.

Second, both archival data and our interviews provide further insights on how government support and societal support shaped enforcement officials' coping behaviour at different times. Regarding government support, some team leaders in 2006 mentioned that district government leaders were often reluctant to let them use the most stringent sanction such as stopping production out of concern for its negative economic impact. Since "Beautiful China" (as part of the grand initiative of "Advance Ecological Civilization and Build a Beautiful China") became one of the most frequently-used phrases of Chinese President Xi Jinping,[4] local government leaders have responded by lending more support to enforcement teams to close down highly-polluting industries or accelerate their relocation to inner provinces. In 2017, most of our interviewees acknowledged a steady increase in government support for environmental protection; at the same time, they also felt increasing pressure from their administrative superiors.

On the one hand, the central and provincial governments have launched sporadic enforcement campaigns to address long-standing environmental problems or meet short-term environmental targets. The local EPB's annual work report in 2015, for instance, noted that the bureau had to report monthly to the municipal government its progress of fuel boiler pollution inspections. Enforcement team officials often found it challenging to give inspected enterprises extra time for corrections. Instead, they need to apply the rules strictly and may even overreact by temporarily closing down plants to meet compliance targets. As shown in the local EPB's annual work reports from 2007 to 2014, such terms as "enforcement with an iron fist," "zero tolerance of non-compliance," and "severely cracking down on violations" were repeatedly used to emphasise the need for strict enforcement.

[4] Source: China Internet Information Center http://news.china.com.cn/2016-11/16/content_39717719.htm, accessed on 1 Nov 2020.

On the other hand, both our interviews and archival data revealed that routine enforcement had increasingly involved inter-agency coordination since 2007.[5] Despite the effectiveness of joint law enforcement, many interviewed officials mentioned that the EPB had been frequently held 'accountable' or 'blamed' by other government entities when things went wrong. Deviations from formal rules became more likely to be challenged by the enforcement officials' administrative superiors and outside constituencies. In this situation, one way to protect themselves was to resort to standardized and strict rule enforcement instead of applying more discretion.

The municipal government has instituted pollution compliant hotlines since 2001 to solicit societal support for environmental protection. In 2003, the local EPB established a more systematic scheme with detailed procedures to handle petitions via letters, calls, and visits to hold enforcement officials accountable for providing successful resolutions for all complaints. During critical events such as the Asian Games in 2010 and the National Congress of the Communist Party of China in 2012, enforcement teams were asked to make 100-percent performance pledges.[6] Among our 2006 interviewees, only four out of twelve team leaders briefly mentioned an increase in citizen complaints to their offices and the media coverage of pollution incidents. In 2017, all twelve team leaders we interviewed mentioned the tremendous societal pressure they faced.

In one sense, societal support may push enforcement officials to move against regulated enterprises (as our hypothesis 3b suggests). But societal support can also complicate the work of enforcement officials. As the local EPB disclosed on its website on May 1, 2010, the municipal enforcement team' strategy of handling environmental petitions was to go the extra mile of

[5] Source: Year-end summary of Environmental Protection in Guangzhou 2010.
[6] Source: The Development of Environmental Protection in Guangzhou: 1972-2016.

bringing complainers and targeted enterprises together face to face.[7] Nevertheless, such a practice is both time- and labor-consuming. On September 10, 2009, it was noted in a meeting with both the municipal and four district enforcement team leaders that "frontline officials became exhausted by the ever-growing complaints"[8]. Our 2017 interviews echoed such influence and further illustrated the increasing volume and the intricate nature of societal demands that require careful discretion in handling individual cases in the years after. For example, when enforcement officials consider more than the goal of sanctioning non-compliance, they tend to apply more discretion to ensure a successful resolution.

> In dealing with rising complaints about small restaurants' noise pollution, we face the dilemma of whether to make sanctioning decisions based on sympathy or considerations for social stability maintenance. We need to use more mediation and negotiation (Team leader, District K).

Last, our interviews also revealed that local enforcement officials had faced increased resistance from some enterprises, especially the smaller ones, which is a possible explanation of why more moving-against tactics were adopted. In 2006, several team leaders mentioned efforts by some small enterprises to evade inspection by blocking their entrance to the facilities or installing an early warning system to stop their polluting activities before the approach of enforcement officials. Some also mentioned enterprises that tried to brag about their political connections during inspections. In 2017, many team leaders suggested that it had become a big headache to ensure that small plants, especially those that were not properly registered and licensed, comply with regulations. At times, these enterprises resorted to violence against enforcement officials.

[7] Source: http://sthjj.gz.gov.cn/zwgk/hjzfdt/content/post_2806918.html, accessed on Nov 4, 2020.
[8] Source: http://sthjj.gz.gov.cn/zwgk/hjzfdt/content/post_2806815.html, accessed on Nov 4, 2020.

DISCUSSION AND CONCLUSION

Although the current literature has examined how frontline officials cope with pressures and conflicts, few studies have examined how coping and its antecedents may evolve in a rapidly changing environment. Drawing on a unique dataset consisting of archival data, surveys, and interviews with frontline enforcement officials during a period of close to two decades, we investigated the evolving trajectory of coping behaviour and the effects of job attitudes, work situations, and institutional support on coping.

This study advances a more dynamic view of coping among street-level officials and provides implications for regulatory enforcement in changing institutional contexts. First, during the study period, frontline officials have become more likely to move against regulated enterprises. This movement against regulatees has been aided by perceptions of resource scarcity and government support that came with more stringent accountability requirements. These findings complement the literature by stressing that despite tremendous contextual changes, the effects of perceived resource scarcity and government support persist over time.

Second, some antecedents of coping, however, have varied in different institutional contexts. Specifically, our study identified a systematic shift in attitudinal explanations of coping: in 2000, organisational identification encouraged frontline officials to move toward regulatees, but the effect no longer existed in 2014. In 2014, pay satisfaction became a significant factor: enforcement officials who were happier with their pay were more likely to move toward regulatees. In other words, under certain circumstances, career benefits are more important than psychological identification in promoting extra-role behaviour. Recent literature challenges the importance of intrinsic motivations in making public sector job choices (Linos 2018). Our study adds to this literature by showing that, under certain circumstances, extrinsic

incentives, rather than intrinsic motivations, encourage extra-role behaviour in everyday work. It is, of course, a separate matter as to whether moving-toward regulatees is necessarily beneficial for environmental regulation enforcement.

Although it may sound paradoxical, our study observes growing evidence about enforcement officials' mixed reactions to different external influences at different times. These findings complement the extant literature investigating the complex process in which state and non-state actors co-shape enforcement strategies (Malesky and Taussig 2017; Marquis and Bird 2018; Zhan et al. 2014). Unlike perceived governmental support that consistently led officials to move against regulatees, societal support encouraged a move against regulatees in 2000 but not in 2014. The classic responsive regulatory literature would suggest that moving towards regulatees is more likely when the regulator is close to the regulated (Ayres and Braithwaite 1992; Braithwaite 2006). Our qualitative investigation offers additional and dynamic insights into how societal demands interact with expectations to complicate such relationships and thereby enforcement officials' coping strategies. Specifically, China's experience in regulatory enforcement cautions against the assumption that new performance and accountability management systems can always enhance policy effectiveness. As the results indicate, enforcement officials adjust their coping behaviour in a more adversarial environment when their performance is primarily determined by handling complaints rather than routine inspections. Such an adaptation leads to goal displacement and may not yield positive regulatory outcomes. Hence necessary steps must be taken to help frontline officials cope with the increased stress triggered by these new management systems (Brodkin 2012; Jokobsen et al. 2018). Otherwise, these officials' service quality may be undermined.

The limitations of this study invite future studies in several directions. First, due to anonymity concerns, we did not ask respondents to report which district enforcement team they worked for in both surveys. Hence it was difficult to gauge local- and team-level differences that may affect the main relationships of interest. Future research may include both locality features and more institutional contingencies to see how frontline workers' coping behaviour evolves to meet new challenges. For instance, information technology development and an increase in inter-agency collaboration may potentially limit the amount of discretion available to frontline officials (Bovens and Zouridis 2002; Hupe and Hill 2007; Tummers and Rocco 2015). It will be an increasingly important research theme to study the impact of these developments on coping among frontline officials in different settings.

Second, future research may also explore how personal factors, such as dispositions, job tenure status, political ideology, as well as psychological and mental health, induce frontline officials to change coping strategies in the face of increasing institutional adversity. In recent years, there has reportedly been an increasing trend of mental health stress among governmental officials in China. Frontline officials are more likely to report anxiety and depression caused by work pressure. This is an understudied topic with significant policy and practical implications (Usman et al. forthcoming). Our findings had also revealed the trend that unrealistic societal demand increases the emotional cost of regulatory enforcement (e.g., stress and burnout). Recent research also found that not being understood by the public affects the performance of liberal-leaning police officers more than that of conservative-leaning ones (Patil 2019). Therefore, more attention is needed to examine whether the relationships between certain personal factors and moving toward regulatees may be moderated by the extent to which the coping strategy is valued by the organization and other stakeholders.

Last, coping strategies have complex effects on policy effectiveness and public service delivery outcomes. The effects of coping on compliance may depend on how regulatees interpret and respond to enforcement practices (Liu forthcoming; Parker 2006). When the officials are too accommodating to regulatees, the latter may sense an easy way out and lose incentives to comply or they could benefit from the guidance to be more motivated and find it easier to comply. Similarly, regulatees facing uncompromising enforcement may choose to comply to avoid potentially large penalties or believe that it is simply easier to evade enforcement. Some recent evidence suggests that confusion about what constitutes compliance is indeed a significant challenge for many enterprises (Liu et al. 2018; Malesky and Taussig 2017). Hence, regulatory compliance may be enhanced if enforcement officials can move toward regulatees by making extra efforts to help them comply. Simultaneously, avoiding compliance by exerting political influence or by simply bribing enforcement officials is not uncommon. Hence, if enforcement officials can show an uncompromising stance in demanding strict compliance, it may enhance compliance motivation. While it is beyond the scope of this study to examine various outcomes of coping due to a lack of objective measures, future studies may adopt a more systematic design to fully understand the outcomes of coping from the perspective of the street-level enforcement officials.

References

Anderson, S.E., Buntaine, M.T., Liu, M., and Zhang, B. 2019. Non-Governmental Monitoring of Local Governments Increases Compliance with Central Mandates: A National-Scale Field Experiment in China. *American Journal of Political Science*, 63(3): 626–643.

Ashforth, B.E. 1989. The experience of powerlessness in organizations. *Organizational Behavior and Human Decision Processes*, 43(2): 207–242.

Assadi, A., and Lundin, M. 2018. Street-level bureaucrats, rule-following and tenure: How assessment tools are used at the front line of the public sector. *Public Administration*, 96(1): 154–170.

Ayres, I., and Braithwaite, J. 1992. *Responsive Regulation, Transcending the Deregulation Debate*. New York: Oxford University Press.

Bardach, E., and Kagan, R.A. 1982. *Going by the Book: the Problem of Regulatory Unreasonableness*. Rev. Ed. Transaction Publishers, Philadelphia.

Baviskar, S., and Winter, S.C. 2017. Street-level bureaucrats as individual policymakers: The relationship between attitudes and coping behavior toward vulnerable children and youth. *International Public Management Journal*, 20(2): 316–353.

Bovens, M., and Zouridis, S. 2002. From street-level to system-level bureaucracies: how information and communication technology is transforming administrative discretion and constitutional control. *Public Administration Review*, 62(2): 174–184.

Braithwaite, J. 2006. Responsive regulation and developing economies. *World Development*, 34(5): 884-898.

Brodkin, E.Z. 2012. Reflections on street-level bureaucracy: past, present, and future. *Public Administration Review*, 72(6): 940–949.

Dukerich, J.M., Golden, B.R., and Shortell, S.M. 2002. Beauty Is in the Eye of the Beholder: The Impact of Organizational Identification, Identity, and Image on the Cooperative Behaviors of Physicians. *Administrative Science Quarterly*, 47(3): 507–33.

Entwistle, T., Guarneros-Meza, V., Martin, S., and Downe, J. 2016. Reframing governance: Competition, fatalism and autonomy in central–local relations. *Public Administration*, 94(4): 897–914.

Evans, T. 2013. Organizational rules and discretion in adult social work. *British Journal of Social Work*, 43:739–58.

Fleming, C.J. 2019. Prosocial rule breaking at the street level: the roles of leaders, peers, and bureaucracy. *Public Management Review*: 1–26.

Folkman, S., and Moskowitz, J.T. 2000. Positive affect and the other side of coping. *American Psychologist*, 55: 647.

Fowler, L. Forthcoming. How to implement policy: Coping with ambiguity and uncertainty. *Public Administration*.

Garrow, E., and Grusky, O. 2013. Institutional logic and street-level discretion. *Journal of Public Administration Research and Theory*, 23: 103–131.

Gassner, D., and Gofen, A. 2018. Street-level management: A clientele-agent perspective on implementation. *Journal of Public Administration Research and Theory*, 28(4): 551–568.

Henderson, A.C. 2013. Examining policy implementation in health care: Rule abidance and deviation in emergency medical services. *Public Administration Review*, 73(6): 799–809.

Hupe, P.L. 2019. The Decision Made: On the Inspection Encounter. In *Inspectors and Enforcement at the Front Line of Government* (pp. 227–258). Palgrave Macmillan, Cham.

Hupe, P., and Hill, M. 2007. Street-Level bureaucracy and public accountability. *Public Administration*, 85(2): 279–299.
Keiser, L. 2010. Understanding street-level bureaucrats' decision making. *Public Administration Review*, 70: 247–257.
Lazarus, R.S. 1993. Coping theory and research: Past, present, and future. *Fifty years of the research and theory of RS Lazarus: An analysis of historical and perennial issues*, 366–388.
Linos, E. 2018. More than public service: A field experiment on job advertisements and diversity in the police. *Journal of Public Administration Research and Theory*, 28(1): 67–85.
Lipsky, M. 1980. *Street-level bureaucracy*. New York: Russell Sage Foundation.
Liu, N. Forthcoming. Institutional Intermediaries and Firm Choices in Response to Regulations. *Academy of Management Journal*.
Liu, N.N., Lo, C.W.H., Zhan, X., and Wang, W. 2015. Campaign-Style Enforcement and Regulatory Compliance. *Public Administration Review*, 75(1): 85–95.
Liu, N., Tang, S.Y., Zhan, X., and Lo, C.W.H. 2018. Political commitment, policy ambiguity, and corporate environmental practices. *Policy Studies Journal*, 46(1): 190–214.
Lo, C.W.H. and Fryxell, G.E. 2005. Governmental and societal support for environmental enforcement in China: an empirical study in Guangzhou. *Journal of Development Studies*, 41(4): 558–588.
Lodge, M. 2009. The public management of risk: The case for deliberating among worldviews. *Review of Policy Research*, 26(4): 395–408.
Malesky, E., and Taussig, M. 2017. The danger of not listening to firms: Government responsiveness and the goal of regulatory compliance. *Academy of Management Journal*, 60(5): 1741–1770.
Marquis, C., and Bird, Y. 2018. The Paradox of Responsive Authoritarianism: How Civic Activism Spurs Environmental Penalties in China. *Organization Science*, 29(5): 948–968.
May, P.J., and Winter, S.C. 2009. Politicians, managers, and street-level bureaucrats. *Journal of Public Administration Research and Theory*, 19: 453–476.
Maynard-Moody, S., and Musheno, M. 2000. State-agent or citizen-agent: Two narratives of discretion. *Journal of Public Administration Research and Theory*, 10: 329–58.
Maynard-Moody, S., Musheno, M., and Musheno, M.C. 2003. *Cops, teachers, counselors: Stories from the front lines of public service*. University of Michigan Press.
Nielsen, V.L. 2006. Are street-level bureaucrats compelled or enticed to cope? *Public Administration*, 84: 861–89.
Nielsen, V.L., and Parker, C. 2009. Testing responsive regulation in regulatory enforcement. *Regulation & Governance*, 3(4): 376–399.
Parker, C. 2006. The "compliance" trap: The moral message in responsive regulatory enforcement. *Law & Society Review*, 40(3): 591–622.
Patil, S.V. 2019. "The Public Doesn't Understand": The Self-reinforcing Interplay of Image Discrepancies and Political Ideologies in Law Enforcement. *Administrative Science Quarterly*, 64 (3), 737–769.
Riketta, M. 2002. Attitudinal organizational commitment and job performance: a meta-analysis. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 23(3): 257–266.
Scholz, J.T. 1991. Cooperative regulatory enforcement and the politics of administrative effectiveness. *American Political Science Review*, 85(1): 115–136.
Schott, C., Van Kleef, D., and Noordegraaf, M. 2016. Confused Professionals?: Capacities to cope with pressures on professional work. *Public Management Review*, 18(4): 583–610.

Somech, A., and Drach-Zahavy, A. 2000. Understanding extra-role behavior in schools: The relationships between job satisfaction, sense of efficacy, and teachers' extra-role behavior. *Teaching and Teacher Education*, 16(5-6): 649–659.

Su, M. Forthcoming. Discretion in Traffic Stops: The Influence of Budget Cuts on Traffic Citations. *Public Administration Review*.

Tilt, B. 2007. The political ecology of pollution enforcement in China: a case from Sichuan's rural industrial sector. *The China Quarterly*, 192: 915–932.

Thomann, E., van Engen, N., and Tummers, L. 2018. The necessity of discretion: A behavioral evaluation of bottom-up implementation theory. *Journal of Public Administration Research and Theory*, 28(4): 583–601.

Tummers, L. 2016. The Relationship Between Coping and Job Performance. *Journal of Public Administration Research and Theory*, 27(1): 150–162.

Tummers L.G., Bekkers V.J.J.M., and Steijn A.J. 2009. Policy alienation of public professionals: Application in a new public management context. *Public Management Review,* 11(5): 685–706.

Tummers, L., and Rocco, P. 2015. Serving clients when the server crashes: how frontline workers cope with E-government challenges. *Public Administration Review*, 75(6): 817–827.

Usman, M., Ali, M., Mughal, F., and Agyemang-Mintah, P. Forthcoming. Policy Alienation and Street-level Bureaucrats' Psychological Wellbeing: The Mediating Role of Alienative Commitment. *Journal of Public Administration Research and Theory*.

van Loon, N.M., and Jakobsen, M.L. 2018. Connecting governance and the front lines: How work pressure and autonomy matter for coping in different performance regimes. *Public Administration*, 96(3): 435–451.

Van Rooij, B. 2006. Implementation of Chinese environmental law: Regular enforcement and political campaigns. *Development Change*, 37(1):57–74.

Yee, W.H., Tang, S.Y., and Lo, C.W.H. 2016. Regulatory compliance when the rule of law is weak: evidence from China's environmental reform. *Journal of Public Administration Research and Theory,* 26(1): 95–112.

Zang, X., and Musheno, M. 2017. Exploring frontline work in China. *Public Administration*, 95(3): 842–855.

Zhan, X., Lo, C.W.H., and Tang, S.Y. 2014. Contextual changes and environmental policy implementation: a longitudinal study of street-level bureaucrats in Guangzhou, China. *Journal of Public Administration Research and Theory*, 24(4): 1005–1035.

Zhan, X., and Tang, S. Y. 2016. Understanding the implications of government ties for nonprofit operations and functions. *Public Administration Review*, 76(4), 589–600.

Tables and Figures

Table 1. Key Variables in the 2000 and 2014 Surveys: Measurement and Comparison of Means

	2000	2014	
	Mean	Mean	T-test statistic
Coping strategy	-0.51	-0.86	**6.13*****
When enforcing regulations,	α = 0.77	α = 0.65	
1. The financial status of the polluting business enterprise is an important factor I consider in handling each case.			
2. The cooperative attitude of the business enterprise is an important factor I consider in handling each case.			
3. I handle each case individually on a case by case basis, not single standard.			
4. I emphasise strict rules more than negotiation with regulated enterprises.			
5. I try to secure compliance through formal rules rather than influencing (education) attitudes.			
6. I am more rules- than results-oriented.			
7. I emphasize consistency more than flexibility.			
Pay satisfaction	3.17	2.64	**5.16*****
1. I am generally satisfied with the amount of pay and fringe benefits I receive.	α = 0.86	α = 0.93	
2. I am paid fairly for what I contribute to this organisation.			
Organizational identification	4.24	3.63	**5.67*****
1. I'm proud to tell my friend I work for the EPB.	α = 0.87	α = 0.78	
2. I tell my friends that my org is outstanding.			
3. I'm willing to work harder to enhance the organisational goal.			
Operational powerlessness	2.85	3.47	**-6.65*****
1. There is a lack of discretion power in my job.			
Resource scarcity	3.39	3.79	**-4.25*****
1. There is a lack of resources in my organisation for enforcement activities.			
Perceived government support	4.22	3.52	**4.91*****
1. There is sufficient support from the municipal government for enforcement.	α = 0.87	α = 0.97	
2. There is sufficient support from the city mayor for enforcement.			
Perceived societal support	4.05	2.98	**7.06*****
1. There is sufficient support from the public for enforcement.	α = 0.93	α = 0.93	
2. There is sufficient support from the mass media for enforcement.			
3. There is sufficient support from the environmental organisations for enforcement.			
Personal information			
Age	37.36	34.74	**2.91****
Education	3.34	3.92	**-8.65*****

** $p < .01$ *** $p < .001$

Table 2. Descriptive Statistics and Correlations

2000 sample	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Coping	-0.51	0.54										
2. Education level	3.34	0.72	-0.05									
3. Education background match	4.22	1.68	0.12	0.11								
4. Years of work	10.06	6.64	-0.22*	-0.17	0.00							
5. Procedural ambiguity	2.95	0.77	0.09	0.04	0.08	0.03						
6. Operational powerlessness	2.85	0.88	0.09	0.10	0.12	0.08	0.28*					
7. Resource scarcity	3.39	0.94	-0.23*	0.09	-0.07	-0.20*	0.18	0.26*				
8. Pay satisfaction	3.17	0.85	0.01	-0.05	0.24*	-0.14	-0.04	-0.18	-0.30*			
9. Organisational identification	4.24	1.34	0.25*	0.16	0.18	-0.06	-0.07	0.19	-0.04	0.05		
10. Government support	4.22	1.80	-0.23*	-0.32*	-0.25*	0.03	0.16	-0.11	0.08	0.10	-0.02	
11. Societal support	4.06	1.90	-0.07	-0.04	-0.06	-0.05	-0.06	0.04	-0.01	0.14	0.28*	0.27*

2014 sample	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Coping	-0.86	0.58										
2. Education level	3.92	0.59	-0.18*									
3. Education background match	3.54	0.98	-0.11	0.09								
4. Years of work	7.44	7.05	-0.11	-0.20*	0.02							
5. Procedural ambiguity	3.34	0.81	0.13	-0.15*	-0.03	0.04						
6. Operational powerlessness	3.47	0.94	0.27*	0.04	-0.02	0.06	0.44*					
7. Resource scarcity	3.79	0.88	-0.07	-0.06	-0.04	0.00	0.29*	0.32*				
8. Pay satisfaction	2.64	1.08	0.27*	-0.10	0.07	0.12	0.04	0.01	-0.17*			
9. Organisational identification	3.63	0.76	0.04	0.07	0.26*	0.02	-0.10	-0.03	-0.05	0.38*		
10. Government support	3.52	0.99	0.02	-0.10	0.16*	-0.05	-0.01	0.01	-0.11	0.23*	0.36*	
11. Societal support	2.98	1.07	0.21*	0.07	0.05	0.04	-0.13	0.15*	-0.08	0.18*	0.18*	0.30*

* $p < .05$

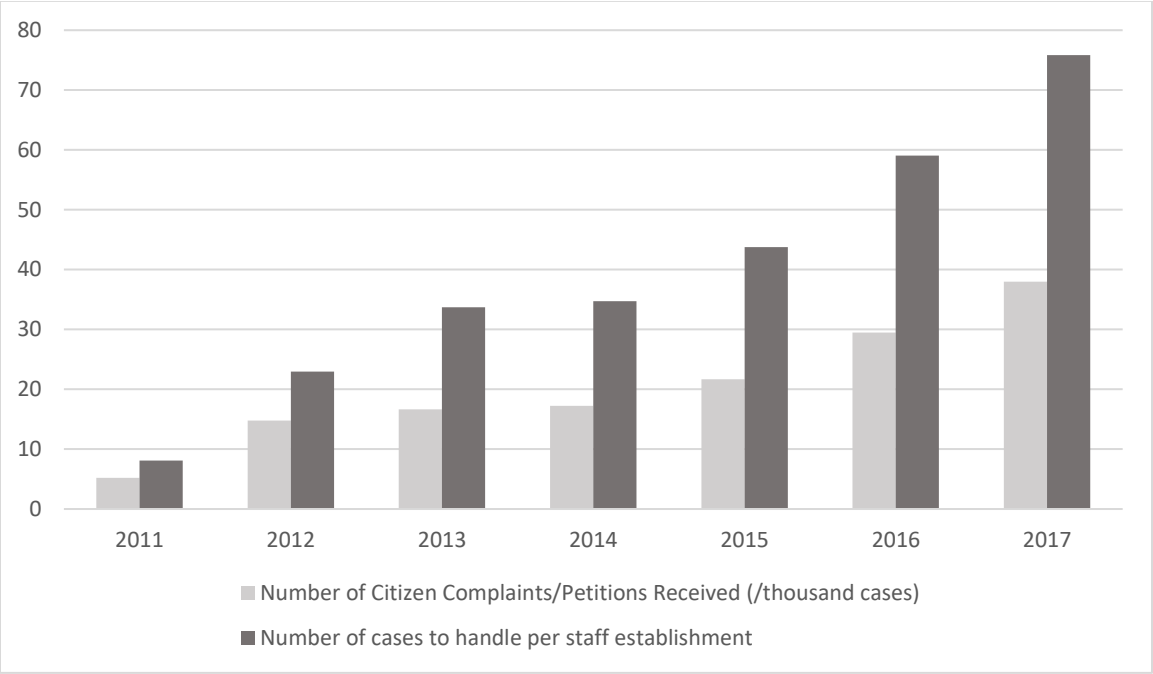
Table 3. Regression results of predicting enforcement officials' coping strategy

	2000 Survey		2014 Survey	
Controls				
District team	0.29**	0.38***	0.37***	0.34***
	(0.11)	(0.11)	(0.08)	(0.08)
Gender	-0.16	-0.10	-0.12	-0.10
	(0.10)	(0.09)	(0.08)	(0.07)
Education level	-0.05	-0.14*	-0.07	-0.13*
	(0.07)	(0.06)	(0.07)	(0.06)
Education background match	0.02	-0.01	-0.06	-0.06
	(0.04)	(0.06)	(0.04)	(0.04)
Years of work	-0.02*	-0.02**	-0.01	-0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
Procedural ambiguity	0.04	0.07	0.04	0.01
	(0.06)	(0.05)	(0.05)	(0.05)
Positive Attitudes				
Organisational identification (H1a)		0.28***		0.02
		(0.08)		(0.05)
Pay satisfaction (H1b)		-0.06		0.10**
		(0.05)		(0.04)
Work Situation				
Resource scarcity (H2a)		-0.12**		-0.11*
		(0.05)		(0.04)
Operational powerlessness (H2b)		0.03		0.15***
		(0.05)		(0.04)
Institutional support				
Government support (H3a)		-0.09*		-0.09*
		(0.04)		(0.04)
Societal support (H3b)		-0.08		0.11**
		(0.04)		(0.03)
Constant	-0.59	-0.30	-0.59	-0.65
	(0.32)	(0.48)	(0.37)	(0.39)
R^2	0.16	0.43	0.16	0.34

Note: our dependent variable measures enforcement officials' location in the one-dimensional space ranging from completely moving against to completely moving toward. A large positive value indicates more moving toward regulatees.
Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

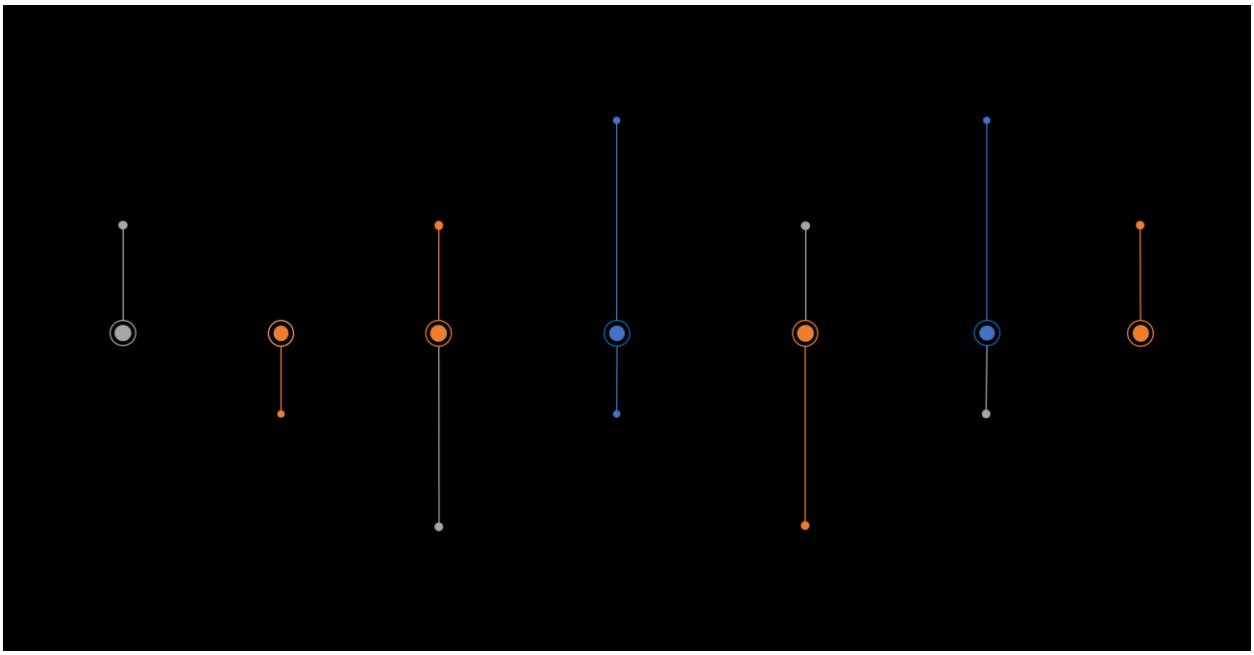
Figures

Figure 1. Swelling Numbers of Citizen Complaints Received by GEPB



Source: Guangzhou Environmental Protection Yearbook 2010-2018, Year-end Summary of Environmental Protection in Guangzhou 2010-2018.

Figure 2. Timeline of Empirical Data Collection and Several Major Institutional Changes and Critical Events



Appendix

Table A1. Regression results of predicting enforcement officials' coping strategy (sub-sample of district enforcement teams only)

	Sub sample		Additional controls	
	2000 survey	2014 survey	2000 survey	2014 survey
Controls				
District team			0.37**	0.30***
			(0.11)	(0.08)
Gender	-0.10	-0.06	-0.09	-0.11
	(0.10)	(0.09)	(0.09)	(0.07)
Education level	-0.14†	-0.13	-0.13*	-0.14*
	(0.07)	(0.08)	(0.06)	(0.06)
Education background match	0.02	-0.03	-0.01	-0.06
	(0.08)	(0.05)	(0.06)	(0.03)
Years of work	-0.02*	-0.01	-0.02**	-0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
Procedural ambiguity	0.05	-0.07	0.07	0.02
	(0.06)	(0.06)	(0.06)	(0.05)
Supervisor support			-0.03	0.07
			(0.08)	(0.05)
Perceived government role			-0.05	-0.15*
			(0.08)	(0.06)
Positive Attitudes				
Organisational identification (H1a)	0.29**	0.09	0.31***	0.03
	(0.10)	(0.07)	(0.09)	(0.06)
Pay satisfaction (H1b)	-0.07	0.07†	-0.05	0.08*
	(0.06)	(0.04)	(0.06)	(0.04)
Work Situation				
Resource scarcity (H2a)	-0.14*	-0.10†	-0.12*	-0.08*
	(0.05)	(0.06)	(0.05)	(0.04)
Operational powerlessness (H2b)	0.00	0.25***	0.03	0.15***
	(0.06)	(0.05)	(0.05)	(0.04)
Institutional support				
Government support (H3a)	-0.09*	-0.11*	-0.09*	-0.09*
	(0.04)	(0.05)	(0.04)	(0.04)
Societal support (H3b)	-0.09	0.06†	-0.08	0.09**
	(0.05)	(0.04)	(0.04)	(0.03)
Constant	0.09	-0.55	-0.15	-0.28
	(0.55)	(0.47)	(0.51)	(0.44)
R^2	0.34	0.28	0.43	0.36

Standard errors in parentheses. † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$