Is Lying Contagious? Spatial Diffusion of High-Yield “Satellites” during China’s Great Leap Forward[1]

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Situated in China’s Great Leap Forward (GLF) campaign in 1958, this study examines the spatial diffusion of “launching high-yield satellites”—exaggerating grain yields, which contributed to the 1959–61 GLF famine that claimed millions of human lives. The authors conceptualize exaggerating grain yields as a political innovation adopted by local cadres to endorse the GLF and signal political loyalty to their superiors. Using geocoded county-level event history data from historical newspaper archives, the authors found that the diffusion of exaggerating grain yields across the country was primarily driven by the interaction between geographic proximity and political proximity.

INTRODUCTION

Many social science studies have documented the critical role of geographic proximity in facilitating the diffusion of human behavior, social action, and innovation from one place to another. Examples include spillover of homicides from one neighborhood to another (Cohen and Tita 1999), diffusion of fertility control across townships or counties (Montgomery and Casterline 1993; Tolnay 1995), adoptions of new technologies and products across

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communities (Hägerstrand 1967) or states (Feldman and Florida 1994), imitation of high church adherence rates in neighboring counties (Land, Deane, and Blau 1991), deterring effects of lynching in nearby locales (Tolnay, Deane, and Beck 1996), intermunicipal contagion of civil liberty legislation among nearby cities (Vasi and Strang 2009), spread of trade unions across districts (Hedström 1994) and political protests across cities (Rasler 1996), and democratization of the world (O'Loughlin et al. 1998; Wejnert 2005). However, these studies often underestimate the impact of other nonspatial environmental contexts on accelerating or deterring social diffusion.

Other researchers shift the focus to social distance as a key element of diffusion in networks. For example, the structural equivalence theory emphasizes the diffusion of innovation driven by peer competition among actors who share a common culture, history, economics, politics, or ideology and, hence, maintain a similar status within a network hierarchy (Friedkin 1984; Burt 1987; Strang and Soule 1998). This theory is typically applied to explaining diffusion in social space without reference to any physical geography (Burt 1987; Strang 1990; Uhlin 1993; Jansen, Sluiter, and Akkerman 2016).

Another line of research on nonspatial environmental contexts investigates the influence of political conditions on diffusion of innovations at both the macro and micro levels. Particular emphasis is placed on how certain characteristics of political systems (e.g., government structure, bureaucratic efficiency, political stability and ideology) may promote or discourage adoption of new ideas, policies, and technologies by collective and individual actors (Wejnert 2002). Some of these studies have explicitly incorporated the concept of geographic proximity (Berry and Berry 1990, 1992; Rasler 1996), while others have not (Bakardjieva 1992; James 1993; Zhou 1993).

While the two lines of research have found that both spatial and nonspatial factors matter, few efforts have been undertaken to examine the differences in the ways both sets of factors independently and jointly affect the spread of sociopolitical movements. We seek to bridge these different strands of diffusion studies through a historical case study of the diffusion process in China's Great Leap Forward (GLF) via the exemplary exaggerated grain yields published in the leading national newspaper, the *People's Daily*, which was the supreme political media accessible to the nation and owned mandatory readership among local cadres at all levels. The GLF was a national campaign launched by the Chinese Communist Party (CCP) in 1958 that mobilized the entire country to adopt radical policies intended to rapidly transform China from a predominantly agrarian society to an industrialized socialist economy. Local cadres across the country falsely exaggerated grain yields throughout the summer of 1958. To better understand the spatiotemporal pattern of this diffusion, we simultaneously examine the independent effects of geographic proximity and political proximity and, more importantly, their joint influence on the spread of the political radicalism of making, submitting, and publishing the high yields.

The diffusion processes studied in this article were marked by the dates on which the locally fabricated yields were published by the *People's Daily*. The dynamics of the diffusion of political lying hinged as much on the local fabrications of high yields as on reporting such fabrications in the supreme political media. On the one hand, in response to the top-down pressure to display political loyalty to GLF, local cadres endeavored to move the exaggerated grain yields bottom up through the hierarchical political structure in the expectation that their fabrications would be recognized and published by the *People's Daily*. Publishing exaggerated high yields was the best way to pay local tribute to this national campaign. On the other hand, the published high yields from one local government added incomparable political legitimacy and honor to their maker and therefore became the most visible motivator to other local governments across the nation. Thus, publishing high yields in the *People's Daily* provoked subsequent attempts to make new fabrications to supersede the current one. That is, a published exaggeration on a certain date marked the end of one specific process to mobilize a local fabrication up and, simultaneously, the beginning of the transmission of such process to another local jurisdiction. One primary task of this article is to gauge the pattern, if any, by which the mobilization of the fabricated yields from local governments to the *People's Daily* diffuses from one county to another. With the availability of event history data, this puzzle directs our research to examine the spatiotemporal dynamics entailed in the event of publishing the exaggerated yields.

We note that it is unclear to what extent the *People's Daily* reports were representative of all the exaggerations that actually occurred in 1958. Nevertheless, in a separate study published elsewhere, we used prefectures as the units of analysis and found that the number of exaggerations reported in the *People's Daily* between June and September 1958 was positively associated with famine severity in 1959–61 (Xu et al. 2016). The rationale was that the exaggerations, also known as the high-yield satellites, published in the *People's Daily* correlated with local cadres' radical agricultural measures including making unrealistic pledges and falsifying grain yields that, in turn, led to the subsequent famine.[2] In other words, the *People's Daily* reports could capture the nationwide variation in underlying levels of actual exaggerations, even though they did not cover all the local exaggerations. The

[2] The term was inspired by the Soviet Union's Sputnik satellite, launched in 1957, invented by journalists from the *People's Daily* and used as a metaphor for achieving unprecedented or record-breaking grain yields at astronomical levels. Since then, the term "high-yield satellite" has become an idiom in the Chinese language and been widely used as a synonym for wild, baseless exaggeration. For simplicity, we use the terms "high-yield satellite" and "exaggeration" interchangeably in the context of the GLF.

predictive power of the hand-coded events data from the *People's Daily* for famine severity in this separate study provides some face validity of its use in the current study.

The principal explanatory variables in this study are geographic proximity and political proximity. Geographical proximity refers to the physical distance between two local jurisdictions (counties in the empirical analysis). Political proximity is defined with regard to the hierarchical structure of both the Chinese government and the organizational system of CCP. China's governmental structure in the 1950s maintained quite a lot of the hierarchical features formed during the late imperial era. The entire nation was administratively divided into provinces (*sheng*), and each provincial government supervised the administration of its subordinate governments. The next level down the hierarchy was the prefecture (*di qu*) to whose authority the county (*xian*) government was held accountable directly. On the hierarchical chain, the governments following the authority of the same direct superior jurisdiction, for example, the counties located within the jurisdictional limit of one prefecture, are politically proximate jurisdictions. The CCP committee was set at each level of government. The provincial CCP committee supervised the work of the subordinate CCP committees at the prefectural and county levels and was the direct superior of the prefectural CCP committees. Likewise, the county-level CCP committees are defined as being in the political proximity if they were accountable to the same prefectural CCP committees.

Specifying the ways in which the geographical and political proximities contribute to the social diffusion and differentiation of their ways is fundamental to our theoretical framework. Social actors are more likely to adopt innovations from their peers located in close geographical proximity, mainly because of better transmission of information. Although sometimes correlated with geographic proximity as in this study, political proximity facilitates or deters the diffusion of political movement in different ways. Actors that are in close political proximity are not necessarily in close geographic proximity. They imitate each other's behaviors primarily because they are subject to the shared top-down pressure and compete for approval or even survival in a political hierarchy. In this sense, actors in close political proximity are structurally equivalent to each other.

Our theoretical explanations hinge on the unique features of geographic proximity and political proximity embedded in China's multilevel political and administrative hierarchy (Qian and Xu 1993; Maskin, Qian, and Xu 2000; Xie 2010). Situating the theory of yardstick competition among promotion-seeking local cadres (Kung and Chen 2011; Lv and Landry 2014) in the context of the hyperpolitical GLF, we draw on a spatial diffusion perspective and the notion of structural equivalence to develop our theoretical concepts of geographical and political proximities and formulate three research hypotheses. We test these hypotheses with event history data extracted from historical newspaper archives and geocoded at the county level. To set the stage, we present a brief historical recapitulation before introducing our theoretical framework. Finally, we discuss the broad theoretical and substantive implications of our findings beyond the historical Chinese context.

HISTORICAL BACKGROUND

By 1949, China's economic growth had been severely traumatized after decades of political upheavals, civil wars, and foreign invasions. After taking control of mainland China, the CCP embarked on the First Five-Year Plan, characterized by centralized economic planning, gradual collectivization in the agricultural sector, state monopoly in the industrial section, and emphasis on heavy industry at the expense of agriculture from 1953 to 1957. These development initiatives were effective overall in that China's agricultural and industrial productions grew steadily at an average annual rate of 3.8% and 19%, respectively (Fairbank and Goldman 1998). The successful economic recovery within a relatively short time period translated into an overoptimistic view among Mao Zedong, the chairman of the CCP and China, and his lieutenants about the Second Five-Year Plan starting in 1958. Combined with an ever-increasing desire to accelerate economic growth, the top CCP leaders decided to aggressively expand heavy industrialization and agricultural collectivization. The overoptimistic, radical view of Mao and his followers was initially criticized by other CCP members and intellectuals. Mao responded to the critics by launching the Anti-Rightist campaign, a political purge that silenced any conceivable opposition, including industrial and agricultural scientists, and set the stage for the GLF (Becker 1996).[3] As a cue to Mao's radicalism, the *People's Daily*, the CCP's official newspaper, published an editorial on November 13, 1957, calling for—and hence dubbing the term—a "Great Leap Forward" in agricultural and industrial production.

On January 1, 1958, the *People's Daily* published its New Year's editorial, proclaiming that China would surpass the United Kingdom in 15 years and catch up with the United States in 20–30 years with respect to steel production, marking the start of the GLF campaign. The entire country was soon set in motion to frequently revise targets for steel, grain, cotton, and other products upward in an attempt to fulfill the GLF spirit of "doing things with greater and faster results" (Yang 1996, p. 34). For example, the goal for grain yield was originally set at 500 million metric tons (MMT), double

[3] In the whole country, about 400,000–700,000 alleged "rightists" were politically persecuted and sent to the countryside and factories for labor reform (Goldman 1987).

that in 1957, but was raised to 700 MMT three months later. Accordingly, local cadres began to modify their plans by either exaggerating their targeted figures by 50% or more or cutting the planned work period for the original target in half or both. The timetable for catching up with the United Kingdom was repeatedly shortened from 15 to 7, 5, and eventually down to 2 years by June 1958.

Walder (2015) provided an excellent account of how wild exaggeration of agricultural plans turned into falsification about ever higher grain yields. During 1958, Mao asserted his dictatorial control of the economy by criticizing and purging other top leaders who refused to exaggerate as "rightists" within the party. When enthusiasm for the GLF became a signal of political loyalty and any opposition could be equated to class struggle, leaders at all levels were under enormous pressured to pledge implausibly large increases in grain output in planning meetings. In these auction-like mobilization meetings, provincial leaders bid against each other for ever higher production targets because no one wanted to be seen as lagging behind in embracing the GLF. The same process cascaded down the hierarchy, and county leaders were pressured by provincial leaders to pledge unrealistic production targets, the sum of which was even higher than the initial provincial pledge, to guard against possible shortfalls. One and perhaps the only viable strategy to fulfill their unrealistic pledges was for lower-level cadres to report fake harvests to superiors. Rather than being exposed, these false reports were publicized and celebrated in the mass media, which in turn pressured more cadres to report fake harvests. By the end of 1958, the national grain production was reported to be 375 MMT, roughly double the yield of 1957. Subsequent verification in 1961, however, placed the actual 1958 yield at 200 MMT (Bernstein 1984).

These wild exaggerations of grain yields led to food shortages in several ways. Top political leaders, believing that China was facing a grain surplus rather than a shortfall (Bernstein 1984; Yang 1996), raised compulsory procurement levels—amounts that collectives must deliver to the state (Ashton et al. 1984; Bernstein 1984). The total grain procurement in 1958 was 22.3% higher than that in 1957 (Yang 1996). In addition, new policies were implemented to divert labor and resources from agriculture to fruitless projects such as the so-called backyard furnace movement later in 1958 and to reduce sown acreage in 1959 (Ashton et al. 1984). Together, these changes resulted in sharp declines in grain production, and rural villages suffered from severe food shortages after compulsory procurement to support urban and industrial growth. Coupled with other man-made and natural devastating factors, the resulting GLF famine of 1959–61 caused an estimated 16.5–30 million deaths, depending on the data sources, underlying assumptions, and methods of estimation employed (Ashton et al. 1984; Coale 1984; Banister 1987; Peng 1987; Yao 1999).

This study focuses on the diffusion of newspaper reports of exemplary extravagant grain outputs pushed by county-level propaganda departments. These highly inflated grain yields were often reported to be on a scale of thousands to tens of thousands of catties per mu (1 catty = 1/2 kilogram; 1 mu = 1/6 acre) in an experimental plot cultivated by a model commune (Bernstein 1984) and publicized nationwide by the *People's Daily* as "launching high-yield agricultural satellites" (Kung and Chen 2011, p. 32) or "launching a Sputnik" (Becker 1996, p. 121). The first high-yield satellite was announced on June 8, 1958, when the front-page headline of the *People's Daily* reported that a People's Commune in Henan Province achieved a significantly higher than average wheat yield of 2,105 catties per mu. This exaggeration was topped the next day when the *People's Daily* reported that another commune in Hubei Province harvested an average of 2,357 catties of wheat per mu. Following this, other regions throughout the country quickly began to overreport grain yields to the *People's Daily*. Among them, the wildest exaggerations reached 8,586 and 130,435 catties per mu for wheat and rice, respectively. For simplicity, we refer to these newspaper reports of high yields as exaggerations of grain yields in the rest of the article.

THEORETICAL FRAMEWORK

Geographic Proximity and Diffusion

Close geographic proximity increases both the frequency of communication and the closeness of social interactions between actors. In case of the diffusion of innovations, geographical proximity enables direct observation of early adopters and helps a potential adopter reduce the uncertainty in assessing potential benefits and risks associated with the innovation. This, in turn, promotes the spread of innovative ideas and encourages imitative behaviors across space (Knoke 1982; Rogers 2003). Where modern communication techniques such as cell phones and the internet are limited or absent, geographic proximity may forcefully facilitate social diffusions. With respect to fertility behaviors, for example, Montgomery and Casterline (1993) found that diffusion of birth control between 1968 and 1981 in Taiwan operated through interpersonal communication about family planning within townships. Such information flow may easily transcend the geographic boundaries of a local community so that birth control diffuses among neighboring counties, as documented during the 20th century in the American South (Tolnay 1995), Costa Rica (Rosero-Bixby and Casterline 1994), and Brazil (Schmertmann, Potter, and Cavenaghi 2008).

In addition to facilitating information transmission, geographical proximity provides forceful guidance to actors in search of advisable behaviors to follow. In face of uncertainty, individual or collective actors could align their behavioral stances using two key conditions: observable information and that the process takes place in sequence (Ermakoff 2015, p. 79). Social actors first observe how other nearby actors respond to contingent situations and then draw inferences to guide their own responses (Ermakoff 2008, chap. 6; Hall 2010, pp. 91–93). Geographical proximity makes a valuable precondition for actors to form alignment with groups who occupy confirmed advantageous positions or reference groups they identify with (Hall 2010, p. 92). Geographical proximity has been found to be a critical means for achieving collective alignment in revolutions (Rasler 1996), regime shifts (Ermakoff 2008), changes in the party organization and electorate (Hedström, Sandell, and Stern 2000), and riots or social movement circumstances (Myers 1997; Vasi and Strang 2009).

In the summer of 1958, exaggerating grain yields was, in essence, a political innovation by local Chinese cadres to endorse the GLF and signal political loyalty to their superiors. Political loyalty was often rewarded with promotion and the associated increases in salary, occupational prestige, authority, and privileged access to bureaucratically controlled goods. These material benefits and nonmonetary perquisites were decisive incentives in a time of austerity when no alternative socioeconomic resources existed outside of the party-state polity and the planned economy (Goldstein 1991; Walder 1995). There was no better way to demonstrate enthusiasm for the GLF and political loyalty than by taking various radical initiatives. Low-ranking cadres who excelled in launching high-yield satellites might receive such an intangible but symbolically significant reward as being chosen as delegates to meet Mao in Beijing (Kane 1988). Provincial party secretaries who increased excessive grain procurement earlier and by a larger margin could earn a better chance of being promoted to membership on the CCP's Central Committee (Goldstein 1991; Kung and Chen 2011). As a whole, Henan Province, where high-yield satellites were invented and most frequently launched, was rewarded for its extraordinary enthusiasm for the GLF by being selected as the site for China's first tractor factory and a giant hydroelectric project on the Yellow River (Becker 1996).

By analogy, geographic proximity may have facilitated the diffusion of high-yield satellites in ways similar to its effect on other social diffusions mentioned above. First, lying about grain yields was by all means a risky measure and initially did not seem to have any foreseeable economic or political benefits. Observing such lies being rewarded rather than punished in nearby areas could reduce the uncertainty in a cadre's risk-benefit analysis and encourage him or her to follow suit. Second, if local cadres did decide to launch a high-yield satellite, they could learn from earlier successes in nearby areas about how to pass the field inspection by upper-level cadres and journalists from local branch offices of the *People's Daily* who might even take photographic evidence of the high yields. In a case study, Li (2009) described the learning experience of the cadres in Qin village of Dongtai County, Jiangsu Province. The Qin village cadres were skeptical about the reported harvest of 7,000 catties of wheat per mu in other provinces because the top figure achieved in Qin village was only about 300 catties per mu. They soon learned that two neighboring counties claimed high yields of 9,328 catties of wheat per mu and 12,000 catties of rice per mu, respectively. Under the pressure to catch up with their neighbors from the county secretary, the Qin village cadres experimented with three agricultural techniques to achieve high grain yields, according to the news reports from the *People's Daily*—deep plowing, intensive seeding, and heavy fertilizing—although none of these worked.[4] Fortunately, by the time their county secretary came to do the field inspection, the Qin village cadres had learned the real method from the two successful neighboring counties: cutting the crops from other fields and secretly moving them to the experiment field in the night, so as to inflate the experiment field's yield.

In addition to promoting communication and mutual learning, geographic proximity could affect the diffusion of high-yield satellites by stimulating yardstick competitions between peer cadres in adjacent areas. Even in democratic countries like the United States, vote-seeking governors would change state taxes on the basis of the tax policies adopted in neighboring states because local voters tended to evaluate the performance of their governor against those in neighboring states as a benchmark for reelection voting decisions (Besley and Case 1995). In Italy, mayors who ran for reelection tended to set local property tax rates in similar ways to those in neighboring cities (Bordignon, Cerniglia, and Revelli 2003). The spatial effects in the form of yardstick competition might be even stronger during China's GLF because in the midst of a hyperpolitical atmosphere, failing to keep up with peer cadres in endorsing the campaign could incur demotion or even political prosecution.

Political Proximity and Peer Competition

Innovations can spread from one actor to another who is close in social space, regardless of the two actors' geographic proximity. The structural equivalence theory suggests that the structural equivalence of actors activates peer competition for prominent positions in a network, and the spread of innovations

[4] These half-baked innovations were learned from the infamous Soviet pseudoscientists Lysenko, Michurin, and Williams and led to a substantial decline in grain yields. Deep plowing destroyed the topsoil and the fertility of the rice fields in the south; intensive seeding led to crop failure, for the closely planted sprouts competed with one another for sunlight, water, and nutrients in the soil; heavy fertilizing relied on mixing real manure with household garbage because the Lysenkoist agrobiology denounced the use of chemical fertilizers (Becker 1996). Nevertheless, appealing to Mao's enthusiastic belief in Lysenkoism, these pseudoscientific innovations, together with collectivization and mass mobilization, were the official explanations for the extraordinarily high yields.

is fueled by the urge to keep up with, if not to outdo, early adopters who are structurally equivalent (Lorrain and White 1971; Burt 1987; Mizruchi 1993; Strang and Tuma 1993; Wejnert 2002). With respect to medical innovation, for example, diffusion of a new medicine was driven by competition among peer physicians to maintain their relative prestige levels in a medical hierarchy (Burt 1987). In the business world, exposure to international competition accelerated the adoption rate of innovative work practices among American manufacturers (Osterman 1994). In the political arena, the spread of violent protests in 1965–75 Italy was driven by intensified competition between old and new protest groups for public support (Tarrow 1989).

The structural equivalence theory often presumes a certain status hierarchy within which lower-level actors adopt innovations in a competitive manner to win approval from upper-level actors; that is, as Strang and Soule (1998, p. 274) have remarked, "We keep up with the Joneses because we cannot afford to fall behind, most importantly in managing our mutual relation to the Smiths." In the context of China's GLF, counties that were in close political proximity shared the same political environment of which the paramount feature might be the top-down pressure from their direct supervising jurisdictions. In the multilevel political and administrative hierarchy (Qian and Xu 1993; Maskin et al. 2000; Xie 2010), which had been established since the Qin Dynasty (221–206 BC), many bureaucratic behaviors resulted from being located in close political proximity. In this political hierarchy, lower-ranking cadres were designated and evaluated by their superiors rather than elected by local voters, despite maintaining a certain degree of local accountability (Xie and Brown 2011).

When it came to power in 1949, the CCP transformed China into a single-party state that consisted of five layers of top-down administration based on a territorial principle: the central state, provinces, prefectures, counties, and townships. The subnational governments were self-sufficient political entities with their own authority and incentives along regional lines (i.e., self-contained within provincial, prefecture, county, and township boundaries). This structure was paralleled by a five-layered hierarchy of the party committee, extending from the CCP's Central Committee led by Mao, which exercised the ultimate control over personnel appointments, promotion, removals, and transfers (Manion 1985; Burns 1987; Li and Zhou 2005), down to the provincial, prefectural, county, and township party committees. The selection of party committee members itself was screened and approved by an upper-level committee (Goldstein 1991).

By the end of 1958, townships in rural China had been replaced by *people's communes*, which fully dissolved private property rights. The civilian administration from central to local government ceased to operate, and the party committees assumed all the governmental, economic, and political functions (Becker 1996). Within each commune, the party committee controlled and managed all rural resources such as land and labor, as well as every aspect of people's work and lives, ranging from farming to dining and from education to marriage. Through the multilevel party hierarchy, a direct line of command reached from the CCP's Central Committee right down to every commune across the country.

In general, top-down pressures in such a hierarchy can lead to peer competition among the county jurisdictions to win political approval or favor from their shared upper-level prefectural jurisdiction. A critical strategy for one jurisdiction to outcompete its peers in close political proximity is to show that it is capable of adopting more radical measures than originally initiated by peers. During the GLF, at any given level of the hierarchy, the party committees were in close political proximity and could be considered structurally equivalent to one another when they were supervised by the same upper-level committee, regardless of whether they were spatially adjacent. As a result, the party committee in one county would experience heavy pressure to launch a high-yield satellite whenever its peer in another county within the same prefecture, spatially adjacent or not, had already done so, because neither of them could afford to fall behind in signaling political loyalty to their mutual prefectural leader (Kung and Chen 2011; Lv and Landry 2014). Such pressure would be reduced when the two county party committees were located in separate prefectures because they would then be supervised by different immediate superiors and would not hold structurally equivalent positions in the political hierarchy. In a word, political proximity triggered peer competitions among the jurisdictions that were in close political proximity to falsely report high yields, resulting in a diffusion process.

In addition, the multilevel feature of the hierarchy raises the possibility of a certain rank order of political proximity among low-level party committees. For example, county party committees located in the same prefecture could be considered in first-order political proximity to each other because they had to compete directly for political approval from the "Smiths"—their mutual upper-level prefectural committee. In contrast, county party committees located in different prefectures (but within the same province) did not share the same immediate "Smiths" and thus might only compete indirectly through the direct competition among their superior prefectural committees. Therefore, the pressure to "keep up with the Joneses" might be reduced but not fully alleviated if an early high-yield satellite was launched in a peer county from a different prefecture.

Interaction between Geographic Proximity and Political Proximity

Despite a host of plausible mechanisms at work, the diffusion effect of geographic proximity may have to be adjusted for potential geographical barriers. For example, in several early studies of municipal government reform in the United States, sociologists and political scientists have noted a hierarchical diffusion process in which the spatial effect did not transcend state or regional boundaries (Scott 1968; Walker 1969; Knoke 1982). As Scott (1968, p. 1093) argued, "The bulk of political interaction and learning for an American municipality takes place within a common environment provided and defined primarily by the state." A municipality will thus choose to identify regional rather than national reference groups for political innovations and policy emulations. Focusing on suburban municipalities in Ohio, Illinois, and California, Scott (1968) discovered state differentials in the rate of adopting council-manager administrative structure between 1950 and 1960 and interpreted this finding as an indication of the state boundary effect. Knoke (1982) extended the analysis to the 267 largest American cities during 1900–1942 and found that council-manager reform was more likely to take place as the percentage of cities in the same census region that had already completed the reform increased. In other words, the diffusion effect of geographic proximity may be restricted to structurally equivalent actors.

Yet, the effect of political proximity based on structural equivalence is modifiable by geographic proximity when the diffusion of innovation takes place in a geographic context. The intensity of peer competition in general may be positively associated with the geographic proximity between structurally equivalent actors simply because they tend to choose someone nearby rather than someone far away as a legitimate reference group. In the United States, for example, state officials in Illinois are more likely to evaluate their own performance relative to their counterparts in Indiana or Ohio than relative to those in New York or California, because the former provide more appropriate guides for policy innovations (Walker 1969). In addition, the adoption of a controversial innovation, such as water fluoridation in American cities in the 1950s (Crain 1966), may require not only information formally circulated through mass media but also information informally conveyed through personal communication, which correlates with geographic proximity. In short, among structurally equivalent actors, early adopters of innovation in close geographic proximity carry more weight in an individual's decision-making process regarding competition and emulation than those that are far away.

Turning back to the Chinese setting, the strict multilevel political hierarchy implies that cadres are frequently in horizontal competition with peers at the same administrative level (Edin 2003*a*, 2003*b*; Kung and Chen 2011) but rarely in vertical competition with their superiors or subordinates. As a result, studies of career incentives of Chinese cadres and their bureaucratic behaviors often treat all the cadres at the same hierarchical level as equal competitors to one another. As discussed above, however, peer cadres in neighboring areas may have a stronger influence than distant ones because geographic proximity reflects similarities in geography, demographics, economy, history, and local culture. These shared features would make spatially adjacent peer cadres look to each other for guidance before taking any action. For instance, the first party secretaries of Anhui and Henan, two neighboring provinces, competed against each other to undertake province-wide radical projects throughout the GLF (Yang 1996). Similarly, despite the emerging famine in 1959, the provincial party secretaries of Yunnan and Guizhou were compelled to keep up with their counterpart in Sichuan, a shared adjacent province in the southwest region, who continued to enforce aggressive GLF-style agricultural policies (Yang and Su 1998).

Meanwhile, the territory principle of China's multilevel political hierarchy suggests that the spatial effect on competition and emulation among lower-level cadres is likely confined to the geographic boundary of their shared upper-level superior (Qian and Xu 1993; Maskin et al. 2000; Lv and Landry 2014). Being held accountable to separate upper-level leaders, two spatially adjacent counties that are located on different sides of the prefectural border are not in direct competition with each other. For example, in a recent study, Lv and Landry (2014) found a positive spatial correlation of tax collection among counties within the same prefectures and concluded that county cadres used the performance of their peers who were accountable to the same prefecture government as a benchmark to compete for promotion.

In short, we expect an interaction between geographic proximity and political proximity in shaping the diffusion of exaggerated grain yields as an innovative strategy for lower-level cadres to signal loyalty and competency to upper-level leaders during the GLF. Geographic proximity to former exaggerations matters, but it matters more when former exaggerations occur in close political proximity and vice versa.

In a recent study, Walder and Lu (2017) examined the diffusion of power seizures across China's county and city jurisdictions in 1967. Similar to ours, their study situates the diffusion process of collective actions in China's rigid political hierarchy while considering the role of geographic distance. However, our study is distinct in several ways. First, while Walder and Lu emphasize a top-down vertical diffusion process, we are primarily interested in horizontal diffusion driven by peer influence. In our theory, whenever a policy target is set too high by upper-level governments (such as during the GLF) or lawful strategies (such as deep plowing, intensive seeding, and heavy fertilizing) are not effective, local cadres may be forced to invent illegal tactics for the sake of survival (Oi 1989), if not promotion. Therefore, our theory can be applied to examining, for example, provincial-level data manipulation to meet the central government's target of economic growth in the 1990s and 2000s (Plekhanov 2017). Second, we operationalize geography proximity and political proximity in different and perhaps more cautious ways. For example, we assume a geographic threshold and focus on the dichotomous spatial adjacency among jurisdictions of equal rank.

We also theorize that, even within the same prefecture, adjacent counties still serve as better yardstick competitors than distant ones and assign distance-decay weights. Third, Walder and Lu treated the interaction between geographic proximity and political proximity more or less implicitly in their theory and empirical analysis. In contrast, we explicitly theorize such an interaction effect and develop a measurement scheme (see the data and methods section) to test it empirically.

Research Hypotheses

Treating counties as the geographic units of interest and county-days as the units of event history analysis, the independent effect of geographic proximity predicts

Hypothesis 1.—*The probability of a county exaggerating its grain yield on a given day would increase if other counties that shared a geographic border (i.e., in close geographic proximity) but not an administrative jurisdiction (e.g., belonging to different prefectures and hence not in close political proximity) had already exaggerated their grain yields.*

The independent effect of political proximity predicts

Hypothesis 2.—*The probability of a county exaggerating its grain yield on a given day would increase if other counties that shared an administrative jurisdiction (e.g., belonging to the same prefecture and hence in close political proximity) but not a geographic border (i.e., not in close geographic proximity) had already exaggerated their grain yields.*

The interaction effect between geographic proximity and political proximity predicts

Hypothesis 3.—*The probability of a county exaggerating its grain yield on a given day would become higher still if similar exaggerations had been made by counties that shared both a geographic border and an administrative jurisdiction.*

DATA AND METHODS

Outcome

The events of interest in this study are wild exaggerations of grain yields reported by county cadres to the *People's Daily*, the nationwide media vehicle of the CCP's propaganda, from June 8 to September 30, 1958. We chose to end the study period with September 30 for two reasons: (1) by then the nationwide fever of exaggeration had largely run its course, as the end of the summer harvest season approached, and (2) the continuity of publishing agricultural satellites was fully disrupted by the shift in the national focus of propaganda toward celebrating the ninth anniversary of the founding of the People's Republic of China on October 1. Overall, the dates of agricultural satellites were clustered over the summer of 1958. Ending this study with September 1958 captures as much of the process of exaggerating grain yields as possible.

We focus on exaggerations with respect to rice and wheat, two dominant food crops in China. In our sensitivity analysis, we included additional food crops, including potato, maize, sorghum, millet, and soybeans (China Agricultural Yearbook Editorial Committee 1981). Following the literature (Kung and Chen 2011) and historical convention (Yang 2012), a reported grain yield of 1,000 catties per mu or more was designated as a wild exaggeration. A county that claimed this level of grain productivity or higher was known as a "1,000-catty county" (千斤县).[5] Full-text copies (with PDF images of the original print version) of the *People's Daily* were acquired from the Asia Library at the University of Michigan. Two researchers (a coauthor and a research assistant) independently read through every section in every issue of the *People's Daily* published between June 8 and September 30, 1958, word by word. News reports about extraordinary high crop yields using such descriptions as "launching satellite" (放卫星) or "high-yield satellite" (高产卫星) were flagged, and the dates, locations, and levels of the exaggerated crop yields were recorded.[6] About 76% of the events independently recorded by the two researchers were matched. The remaining unmatched records were then reconciled by reexamining original newspaper articles together.

We identified a total of 540 exaggerations of rice/wheat yields from the *People's Daily* published during the study period. It was possible that

[5] Real agricultural innovations and output growth did not take place until the early 1970s when new high-yielding varieties of grain seeds were introduced, the area of irrigated farmland was expanded, and the production of agricultural machinery and chemical fertilizers increased. Together with agricultural decollectivization, however, the yield of new rice hybrids was only 758 catties per mu in 1977 (Bramall 1995). Even by 1980, the 99th percentile of county-level average grain yield was merely 740 catties per mu, and only four counties across the country had reached the threshold of 1,000 catties per mu (Department of Agriculture 1989). By 2013, the national average grain yield reached roughly 786 catties per mu, and only one province (Jilin) surpassed the threshold of 1,000 catties per mu (about 1,050) according to the National Bureau of Statistics (2014).

[6] These key terms were initially chosen according to common knowledge and historical studies of the GLF (e.g., Becker 1996; Yang 2012). About 51.5% of the news articles we identified used one or more of these terms. The remaining news reports provided the specific levels of crop yields, allowing us to identify them as wild exaggerations (i.e., 1,000 catties per mu or more).

spatiotemporal clustering of exaggerating grain yields might be because of similar agricultural patterns and the timing of harvest in geographically adjacent counties. This issue might be partially alleviated as we did not distinguish between wheat and rice, different types of wheat (e.g., spring wheat vs. winter wheat), or different types of rice (e.g., double cropping vs. triple cropping; early, middle, or late season rice), which varied in the timing of harvest. This coding scheme allowed that exaggeration of, say, early season rice (typically planted in early spring and harvested in early summer) in one county to stimulate exaggeration of winter wheat (typically planted in southern China in early fall and harvested in early summer) in its neighboring counties. Nevertheless, as a sensitivity check, we identified another 89 exaggerations of other food crops, including millet, maize, barley, and potatoes, which differed in the timing of their harvest compared with rice and wheat. This further increased the flexibility for a county to exaggerate the yield of a different food crop compared with its neighboring counties.

Some of the inflated grain yields were reported on the same dates by people's communes within the same counties. However, we were only able to geocode all the exaggerations at the county level according to county boundaries in 1958, because of the lack of more detailed historic information on the geographic locations or boundaries of people's communes. For the event history analysis, we counted only one event at the county level if there were multiple exaggerations at the subcounty level on the same date, resulting in a total of 317 events for rice and wheat and another 50 events for other food crops. Nevertheless, counties are appropriate units of analysis for two reasons. First, county governments have been one of the lowest levels in China's highly hierarchical government administration (above township and village but below province and prefecture) and held accountable to local people's welfare for the past 2,000 years since the Qin dynasty (Leijonhufvud 2009; Xie and Brown 2011). Second, after the establishment of the People's Republic of China, county governments retained the authority to experiment with new local policies or to tailor a national policy to regional variation (Wagstaff et al. 2009). According to the 1958 administrative boundary map, our sample consisted of 2,225 counties nested within 230 prefectures across 28 provinces.

Another measurement issue pertains to the temporal dimension. The date when an exaggeration was published in the *People's Daily* might not be exactly the same as that when local cadres falsified grain yields. That is, the real action preceded its news report. Therefore, the measured duration from the onset of risk to the event occurrence based on the daily news reports may not perfectly reflect the true duration in days. Nonetheless, we have no compelling reason to expect any systematic regional variation in this measurement error because of the nationwide network of news stations owned by the *People's Daily* and equipped with modern communication techniques such as the telephone and telegraph. In regression analysis, we employed semiparametric

Cox models that were robust against inaccurate measures of duration as long as the temporal sequence of events was reliable.

Independent Variables

The key, time-varying independent variables are frequencies of exaggerating grain yields in other counties that are close in terms of both geographic and political space. Table 1 shows a typology of neighboring counties cross-classified by geographic proximity and political proximity. Two counties are considered to be in close geographic proximity and referred to as type A neighbors if they share a border and as type B neighbors otherwise. This dichotomous definition of geographic proximity is widely adopted in relatively large-scale diffusion studies such as those involving counties and states (Berry and Berry 1990; Mintrom 1997; Andrews and Seguin 2015). This choice is supported by the local diffusion pattern discovered in our exploratory space-time analyses (see the results section). Spatially adjacent type A neighbors can be further divided into three subgroups based on their political proximity: type A1, counties in first-order political proximity, defined as being nested within the same prefectures; type A2, counties in second-order political proximity, defined as belonging to different prefectures of the same provinces; and type A3, counties not in close political proximity, defined as belonging to different provinces. Similarly, spatially nonadjacent type B counties can be further classified as follows: type B1, those nested within the same prefectures (i.e., first-order political proximity); type B2, those located in different prefectures of the same provinces (i.e., second-order political proximity); and type B3, those located in different provinces and thus neither spatially nor politically close.

Note that this typology corresponds to the model parameterization that includes the interaction between geographic proximity and political proximity

TABLE 1
Typology of Geographic and Political Proximity for Any Two Counties in China's Multilevel Administrative Hierarchy

Share Geographic Boundary	Relative Locations of Two Given Counties		
	In the Same Province		In Different Provinces
	In the Same Prefecture	In Different Prefectures	
Yes	Type A1: geographic neighbor; first-order political neighbor	Type A2: geographic neighbor; second-order political neighbor	Type A3: geographic neighbor
No	Type B1: first-order political neighbor	Type B2: second-order political neighbor	Type B3: not a neighbor at all

in addition to their main effects. Specifically, the main diffusion effect of geographic proximity (hypothesis 1) is captured by exaggerations in type A3 neighbors, while the main effects of first- and second-order political proximity (hypothesis 2) are captured by exaggerations in type B1 and B2 neighbors, respectively. The interaction effects of geographic proximity and political proximity (hypothesis 3) are captured by exaggerations in type A1 and A2 neighbors. This parameterization also makes it more explicit that not all counties possess the same neighboring structure. For example, if a county is spatially surrounded by type A1 neighbors, then it does not border on any other county from a separate prefecture or province; that is, it has no type A2 or A3 neighbors by definition. As a robustness check, we restricted the sample to counties that have at least one neighbor of each type.

Because of these skewed distributions, we coded the cumulative frequency of exaggerating grain yields in each type of neighboring county into three categories: none, one, or two or more. We included the number of neighbors in each category in regression models to control for a county's potential amount of exposure to peer influence. We also controlled for the natural logarithm of each county's area calculated in squared kilometers based on the 1958 county-level map.

Other control variables were drawn from historical government statistics (Department of Agriculture 1989), biographies of top CCP officials, and geographic data constructed by the Institute of Geographic Sciences and Natural Resources Research (IGSNRR) at the Chinese Academy of Sciences. A dichotomous variable indicates whether or not a county was designated as an ethnic minority area where the CCP usually did not enforce radical economic policies for fear of igniting ethnic conflicts. Another dichotomous variable, motivated by Yang's (1996) hypothesis of loyalty compensation, indicates whether or not a county was an old revolutionary base and captures a county's history of political loyalty to the CCP and enthusiasm about political campaigns such as the GLF. According to Yang (1996), areas that were liberated later by the CCP in the 1940s might be more radical than the old revolutionary areas, to demonstrate their loyalty to the political center. A third dichotomous variable, motivated by Yang, Xu, and Tao (2014) and Kung and Zhou (2020), indicates whether or not a county was the hometown of at least one Central Committee member of the Eighth National CCP Congress. The Central Committee comprises the top leaders of the CCP, and its members are nominally elected once every five years by the National CCP Congress. An incumbent Central Committee member could influence local politics either directly by intervening in provincial and lower-level policies in a way most favorable to his or her hometown (Kung and Zhou 2020) or indirectly by encouraging hometown officials with strong network ties to demonstrate stronger loyalty and behave more radically (Yang et al. 2014). We identified a total of 197 Central Committee members who were first elected in 1956 and later amended in 1958 from *A Dictionary of the CCP Central Committee Members of Various Plenums, 1921–1987* (Liu and Shen 1992).[7] For 183 of them, we successfully geocoded their birthplaces at the county level.[8]

We considered two proxy variables for agricultural productivity. A county's terrain was classified by the Department of Agriculture into one of four categories: plain, pasture, hill, or mountain (reference category). Potential yields of five main crops (wheat, rice, maize, potato, and soybeans) at 1 kilometer spatial resolution were estimated by the IGSNRR using the Global Agro-ecological Zones model (Liu, Xu, and Chen 2015). In the model, agroclimatic potential crop yields were determined by the availability of solar radiation and seasonal temperature using terrain elevation data and meteorological data (including air temperature, precipitation, humidity, wind speed, and sunshine hours), while the actual attained rain-fed yields were further constrained by water availability (based on irrigation data and farmland distribution data), soil conditions (including soil type, effective soil depth, and soil water-holding capacity), and terrain slopes. We calculated the average potential crop yields in 1970, using the earliest data available, across all the grid cells within each county as the final measure. A dichotomous variable, indicating whether a county's average per capita annual income in rural areas reached 800 yuan or more in 1986, a threshold chosen by the Department of Agriculture, captures the overall economic condition. Finally, we controlled for regional fixed effects through a set of dummy variables indexing eight economic zones designated by the Development Research Center of the State Council (2004).

We were unable to control for pledged production targets made by local cadres in advance of the harvest because of the lack of data. Local cadres who pledged higher targets might be under greater pressure to falsify grain yields. Thus, a substantial variation in the pressure to fulfill the unrealistic pledges would produce variations in false reports after the harvests. Unfortunately, it is beyond the scope of this study to collect historical data on the pledges made before the summer of 1958.

Exploratory Space-Time Statistics

Diffusion in itself implies a temporal correlation. However, first-order clustering of events in space or time alone does not necessarily indicate a diffusion

[7] The Eighth National CCP Congress was held in two sessions, the first September 15–27, 1956, and the second May 5–23, 1958. The first session elected 97 full members and 73 alternate members of the Central Committee. The second session elected another two full members and 25 alternate members. The next National CCP Congress was not held until 1969.

[8] Among the remaining 14 members, four were born abroad, and 10 did not have sufficient birthplace information for county-level geocoding.

process. Instead, the signature of diffusion is second-order clustering in both space and time (Schmertmann, Assunção, and Potter 2010). We detect space-time clustering by calculating the $D(s, t)$ statistic (Diggle et al. 1995) as follows:

$$D(s,t) = \frac{K(s,t) - K_s(s)K_t(t)}{K_s(s)K_t(t)}, \tag{1}$$

where $K(s, t)$ is a bivariate K-function calculated at a range of geographic scale s and temporal scale t. For a spatiotemporal homogeneous Poisson process,

$$K(s,t) = 2\pi s^2 t. \tag{2}$$

If the component processes operating in space and time are independent of each other (i.e., no space-time clustering), the bivariate K-function can be factorized as

$$K(s,t) = K_s(s)K_t(t), \tag{3}$$

which is analogous to the independence between two random variables. In essence, the value of $D(s, t)$ reflects the proportional increase in or excess risk of the event attributable to space-time interaction, compared with independent spatial and temporal processes (Diggle et al. 1995).

Event History Model

When longitudinal spatial data are available, event history methods provide a natural framework for modeling diffusion processes (Strang and Tuma 1993; Allaway et al. 1994; Hedström et al. 2000). This framework treats the space-time path of exaggerating grain yields as a dynamic, probabilistic process influenced by time-varying and time-constant factors. An event history model can accommodate the fact that some counties exaggerated grain yields only once, others falsified repeatedly, and still others remained honest.

To draw on as much data as possible for better statistical inference, we estimated two sets of event history models: models of event debut (the first exaggeration made by a county) and models of repeated events (multiple exaggerations made by the same county). For event debut, we defined June 8, 1958, when the notion of the high-yield agricultural satellite was first invented and publicized nationwide, as the starting point of the risk period. For repeated events, we defined the day right after a previous exaggeration as the new starting point of the risk period for the subsequent event. Right censoring occurred if no exaggeration had been made by September 30.

For event debut, we estimated Cox models of the natural logarithm of the hazard as a linear function of time-varying and time-constant covariates as follows:

$$\log h_i(t) = h_0(t) + \sum_{j=\mathrm{A1}}^{\mathrm{B2}} \beta_j x_{i,j}(t) + \gamma Z_i, \quad (4)$$

where $h_0(t)$ denotes the baseline hazard, $x_{i,j}(t)$ indexes the frequency of exaggerating grain yields in the jth type (ranging from type A1 to B2) neighboring counties for the ith county, β_j is the corresponding regression coefficient, and all the other control variables for the ith county are time constant and denoted by Z_i.

For repeated events, we allowed baseline hazards to vary by event order to accommodate within-county correlation in event times due to event dependence as follows:

$$\log h_{ik}(t) = h_0(t_k - t_{k-1}) + \sum_{j=\mathrm{A1}}^{\mathrm{B2}} \beta_j x_{i,j}(t) + \gamma Z_i, \quad (5)$$

where k denotes event order (i.e., the first, second, . . . , and kth exaggeration), and $h_0(t_k - t_{k-1})$ is the baseline hazard rate, stratified by event order to control for event dependence, in which the component $(t_k - t_{k-1})$ incorporates the conditional gap time structure so that the hazard gives the risk for the kth event since the $(k - 1)$th event. Throughout the regression analysis, we calculated P-values based on robust standard errors that adjust for the potential correlation of counties clustered within the same prefectures.

In essence, equations (4) and (5) specified event history models with spatially lagged predictors. An alternative strategy is to consider multilevel models in which counties are nested within prefectures that in turn are nested within provinces. This approach requires estimating weakly identified parameters of the random effects, leading to model convergence problems in our preliminary analysis. More important, multilevel models would ignore our hypothesized theoretical differences across counties that are nested within the same administrative hierarchy but located in different geographic proximities.

RESULTS

Descriptive Statistics

Table 2 reports the frequency distributions of exaggerating rice/wheat yields at the county level in the full sample and the subsample, respectively. As mentioned above, the subsample is restricted to the counties that have at least one neighbor for each of the five neighboring types and hence are

TABLE 2
FREQUENCY DISTRIBUTIONS OF EXAGGERATING RICE/WHEAT YIELDS AT THE COUNTY LEVEL BY SEPTEMBER 30, 1958

N OF EXAGGERATIONS OF RICE/WHEAT YIELDS	FULL SAMPLE		SUBSAMPLE	
	N of Counties	%	*N* of Counties	%
0	1,944	87.4	294	87.8
1	181	8.1	27	8.1
2	62	2.8	7	2.1
3	20	.9	5	1.5
4+	18	.8	2	.6
Total	2,225	100	335	100

usually located along prefectural and provincial borders. In the full sample of 2,225 counties, 12.6% made at least one exaggeration by September 30, 1958. Among them, about 35.6% (100 out of 281) exaggerated rice/wheat yields more than once, and 6.4% (18 out of 281) exaggerated four times or more, suggesting extreme enthusiasm for the GLF campaign. The frequency distribution is similar in the restricted subsample. When we take types of food crops other than rice and wheat into account, the frequency distributions of exaggerating grain yields remain qualitatively unchanged (see table A1).

The descriptive statistics of the independent variables are summarized in table A2. Without diving into the details, it is worth noting that, for an average county, its spatially nonadjacent political neighbors (i.e., types B1 and B2) outnumbered its spatially adjacent neighbors (i.e., types A1–A3). Therefore, it is not surprising that in both the full sample and the subsample, the total frequency of exaggerating rice/wheat yields was considerably greater in type B1 and B2 neighbors than that in type A1, A2, or A3 neighbors. For example, in 89.2% of counties in the full sample, there were two or more exaggerations in type B2 neighbors, compared with 17.2% or fewer counties whose type A neighbors exaggerated more than once.

Exploratory Space-Time Patterns

Figure 1 illustrates the spatial variation in the total number of grain yield exaggerations at the prefectural level rather than the county level for better visualization. Regional clusterings of large numbers of exaggerations, colored in red or orange, are clearly visible in central China, that is, the middle reaches of the Yangtze River and the Yellow River. The clusterings of frequent exaggerations also appear to transcend provincial boundaries. It was not surprising that these regions were also hit harder by the GLF famine in subsequent years than other parts of the country (Xu et al. 2016). Yet, mixed colors in any given province also suggest that within-province variation in

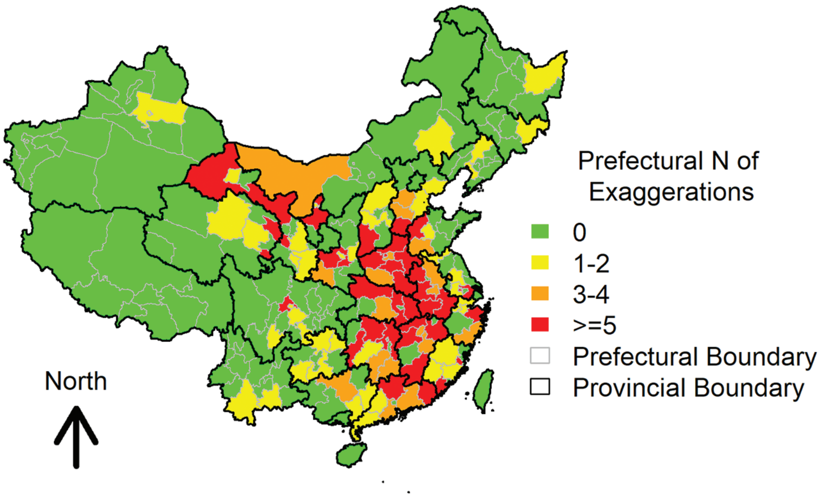

FIG. 1.—Prefectural total number of exaggerations of rice/wheat yields

the frequency of exaggerations was not uncommon even in the least (*green*) or most (*red*) radical provinces.

The left panel of figure 2 depicts the county-level daily trends of cross-sectional global spatial correlation of exaggerating grain yields, measured by Moran's I. The global spatial correlation increased quickly, became statistically significant at the 0.05 level four days (June 12) after the first high-yield satellite was launched (June 8), and reached its peak value at about 0.23 after another five days (June 17). After that point, the values of Moran's I experienced a sudden decline but remained statistically significant as new exaggerations began to scatter around other parts of the country. The degree of spatial correlation began to rise again from the end of June on and remained relatively stable thereafter, despite occasional fluctuations as more counties jumped on the bandwagon of falsification.

The temporal trend of Moran's I is informative of first-order event clusters in space and time separately, but it tells us little about the second-order space-time interaction. The right panel of figure 2 addresses this challenge by plotting county-level $D(s, t)$ against geographic proximity (in kilometers) and time (in days) simultaneously. The maximum value of $D(s, t)$ was approximately 5.2, meaning that the greatest excess risk of exaggerating rice/wheat yields attributable to space-time interaction was about five times as high as that attributable to two independent spatial and temporal processes. The value of $D(s, t)$ reached its peak at a spatial radius of roughly

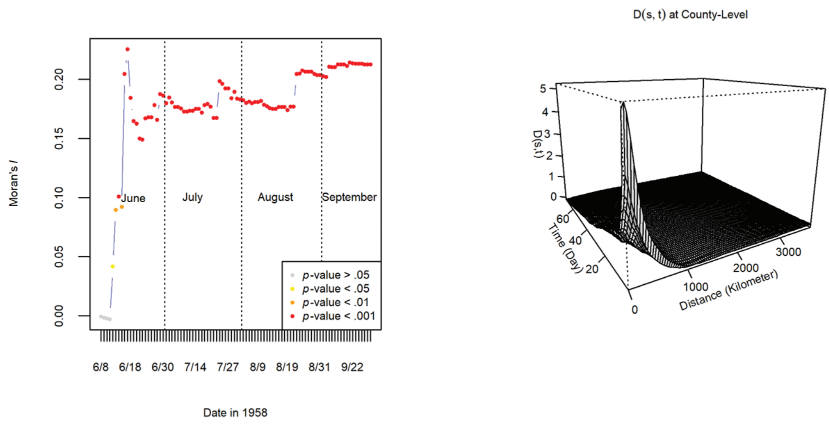

FIG. 2.—Exploratory spatiotemporal patterns of exaggerating rice/wheat yields at the county level during the study period (from June 8 to September 30, 1958).

40 kilometers and a time window of two days and then declined sharply within about 400 kilometers in space and 10 days in time. Given that the median distance between any two adjacent counties was about 50 kilometers, these results imply that the diffusion of exaggerating rice/wheat yields was driven by mutual influences of exaggerations that occurred close to each other in space and time.

Event History Regression Estimates

Table 3 reports coefficient estimates from the models of event debut—exaggerating rice/wheat yields for the first time. In the full sample, the coefficient associated with two or more exaggerations in type A3 neighbors was statistically significant at the 0.05 level, lending weak support to hypothesis 1 about the main effect of geographic proximity. In contrast, the coefficients were significantly positive for exaggerations in both type B1 and B2 neighbors, supporting hypothesis 2 about the main effect of political proximity. Similarly, one or more exaggerations in type A1 neighbors were associated with the higher risk of a county launching its own exaggeration, which supported hypothesis 3 about the interaction effect between geographic proximity and first-order political proximity. There was also some evidence of the interaction effect between geographic proximity and second-order political proximity given the positive significant coefficient associated with one exaggeration (but not two or more) in type A2 neighbors. However, in the subsample of the counties that had at least one neighbor of each type, the coefficients remained statistically significant for exaggerations in type A1

TABLE 3
COEFFICIENT ESTIMATES FROM EVENT HISTORY MODELS OF EXAGGERATING RICE/WHEAT YIELDS AT THE COUNTY LEVEL: EVENT DEBUT

	Full Sample		Subsample	
Exaggerations of rice/wheat yields in:				
Type A1 neighbors (ref: none):				
1	1.22***	(.20)	2.01***	(.46)
≥2	1.91***	(.19)	2.23***	(.59)
Type A2 neighbors (ref: none):				
1	.66**	(.23)	.32	(.69)
≥2	.40	(.29)	−.24	(.86)
Type A3 neighbors (ref: none):				
1	.37	(.30)	1.70***	(.40)
≥2	.65+	(.37)	.30	(.81)
Type B1 neighbors (ref: none):				
1	1.02***	(.21)	.35	(.53)
≥2	.98***	(.21)	.21	(.47)
Type B2 neighbors (ref: none):				
1	.78**	(.28)	.31	(.75)
≥2	.89**	(.32)	.08	(.79)
Estimated crop yield potential in 1970 (logged catty/mu)	.27***	(.07)	.01	(.21)
Terrain (ref: mountain):				
Plain	.35+	(.21)	.42	(.67)
Hilly	.48*	(.19)	.30	(.55)
Pasture	−1.05	(.98)	−.72	(1.57)
Hometown of a Central Committee member of the party (ref: no)	.41+	(.22)	1.18*	(.51)
Old revolutionary base (ref: no)	−.14	(.22)	−.74	(.70)
Ethnic minority area (ref: no)	.13	(.28)	.68	(.87)
High-income area (ref: no)	.41	(.38)	1.68	(1.67)
County area (logged km^2)	−.02	(.06)	−.51	(.32)
Control for *N* of each type of neighboring counties	Yes		Yes	
Region fixed effects	Yes		Yes	
N of counties	2,225		335	
N of events	281		41	

NOTE.—Robust SEs are in parentheses. Type A1 neighbors are geographically adjacent counties in the same prefectures, type A2 neighbors are geographically adjacent counties in different prefectures of the same provinces, type A3 neighbors are geographically adjacent counties in different provinces, type B1 neighbors are geographically nonadjacent counties in the same prefectures, and type B2 neighbors are geographically nonadjacent counties in different prefectures of the same provinces.

+ $P < .1$.
* $P < .05$.
** $P < .01$.
*** $P < .001$.

neighbors but not for those in type A2, B1, or B2 neighbors. Yet, the coefficient of one exaggeration in type A3 neighbors became significant.

The same pattern held when we repeated the analyses for exaggerating all-type food crop yields (see table A3). First, the coefficient estimates for the main effects of geographic proximity (hypothesis 1) and political proximity (hypothesis 2) were sensitive to the choice of sample. Second, hypothesis 3 was supported to the extent that a robust, positive association existed between the risk of event debut and the exaggerations in type A1 neighbors.

As for the other control variables, counties characterized by hilly terrain were more likely to exaggerate their rice/wheat yields, compared with mountainous counties in the full-sample model. Counties with greater crop yield potential were also more likely to exaggerate rice/wheat yields. In the subsample model, being the hometown county of a CCP Central Committee member was positively associated with the risk of exaggerating rice/wheat yield. Some of the remaining variation was explained by the regional fixed effects, but no clear pattern could be discerned.

Table 4 reports coefficient estimates from the models of repeated exaggerations of rice/wheat yields. We did not include higher-order events because the sample size became increasingly small for the fourth event or beyond as shown in table 2. Overall, the findings resembled those from the models of event debut in that the most robust predictors of the event risk were the exaggerations in type A1 neighbors. Aside from changes in estimated coefficient sizes, one notable difference pertains to the statistical significance for exaggerations in type B2 neighbors. Specifically, in the full sample, one exaggeration only in type B2 neighbors became insignificantly related to an increased risk of exaggeration in a focal county, which was not the case in the model of event debut. Yet, the coefficient for one exaggeration only in type A3 neighbors was significant in the subsample model of event debut (shown in table 3) but not significant in the subsample model of repeated events (shown in table 4). The inconsistent estimates of the coefficients for exaggerations in type A3 neighbors indicate inconclusive evidence for the main effect of geographic proximity (i.e., hypothesis 1).

Yet, any significant association between exaggerations in other types of neighboring counties found in the full sample was not sustained in the subsample. Finally, similar results showed up again when we extended the analyses to the repeated exaggerations of all-type food crop yields (see table A4). In a word, the most robust diffusion effect pertains to the interaction between geographic proximity and first-order political proximity.

DISCUSSION AND CONCLUSION

The fever of launching high-yield crop satellites disappeared in October 1958 as food shortages began to emerge, but the damage had already been done. The GLF famine started as early as the 1958–59 winter in Sichuan Province (Bramall 2011) and January 1959 in Henan Province (Yang 2012). The famine had spread to the rest of the country by the autumn of 1959. China's actual grain output did not return to 1957–58 levels until 1965–66 (Li and Yang

TABLE 4
COEFFICIENT ESTIMATES FROM EVENT HISTORY MODELS OF EXAGGERATING RICE/WHEAT YIELDS AT THE COUNTY LEVEL: REPEATED (First–Third) EVENTS

	Full Sample		Subsample	
Exaggerations of rice/wheat yields in:				
Type A1 neighbors (ref: none):				
1	.93***	(.17)	1.65***	(.41)
≥2	1.54***	(.18)	2.26***	(.51)
Type A2 neighbors (ref: none):				
1	.47**	(.18)	.46	(.46)
≥2	.18	(.20)	.47	(.61)
Type A3 neighbors (ref: none):				
1	.11	(.24)	.69	(.48)
≥2	.55+	(.29)	.20	(.51)
Type B1 neighbors (ref: none):				
1	.88***	(.18)	.64	(.45)
≥2	.74***	(.17)	.29	(.44)
Type B2 neighbors (ref: none):				
1	.38	(.25)	.23	(.58)
≥2	.64*	(.26)	.05	(.68)
Estimated crop yield potential in 1970 (logged catty/mu)	.27***	(.06)	−.01	(.15)
Terrain (ref: mountain):				
Plain	.27	(.18)	.53	(.54)
Hilly	.31+	(.16)	.29	(.41)
Pasture	−1.20	(.82)	−1.02	(1.15)
Hometown of a Central Committee member of the party (ref: no)	.28	(.18)	.79	(.52)
Old revolutionary base (ref: no)	−.23	(.18)	−.92+	(.54)
Ethnic minority area (ref: no)	.11	(.26)	.94	(.69)
High-income area (ref: no)	.19	(.29)	1.35	(1.57)
County area (logged km²)	−.01	(.05)	−.46*	(.23)
Control for *N* of each type of neighboring counties	Yes		Yes	
Region fixed effects	Yes		Yes	
N of counties	2,225		335	
N of events	419		62	

NOTE.—Robust SEs are in parentheses. Type A1 neighbors are geographically adjacent counties in the same prefectures, type A2 neighbors are geographically adjacent counties in different prefectures of the same provinces, type A3 neighbors are geographically adjacent counties in different provinces, type B1 neighbors are geographically nonadjacent counties in the same prefectures, and type B2 neighbors are geographically nonadjacent counties in different prefectures of the same provinces.

\+ $P < .1$.
* $P < .05$.
** $P < .01$.
*** $P < .001$.

2005). The practice of launching high-yield satellites was abandoned in the following years, but false reporting of grain output continued in the opposite direction. Out of fear of another famine, peasants and production team leaders started bribing and colluding with brigade and commune cadres to intentionally underreport local grain yields in order to evade the state procurement in the 1960s and 1970s (Oi 1989). Nevertheless, the phrase "launching high-yield satellites" itself has become widely used synonymously with lying in the Chinese vocabulary to date.

It was not any single event but the nationwide, collective lies about local grain yields that misguided China's top leaders into the delusion of an unprecedented harvest in 1958, which in turn contributed to the subsequent famine of 1959–61 that caused millions of deaths. In this study, we demonstrate that the collective exaggerations of grain yields did not occur randomly but exhibited a distinct spatial diffusion pattern. Contextualized in China's multilevel hierarchical party-state system and the political radicalism during the GLF, three interrelated research hypotheses about the diffusion of exaggerated grain yields at the county level were proposed. Our study improves on the previous research in several significant ways. First, proposing the notion of political proximity, we contribute a new variant of structural equivalence—intermunicipal political ties in an authoritarian regime—to the existing studies that concern social ties or interactor dependencies in certain personal, organizational, or national networks (Burt 1987; Strang 1990; Galaskiewicz and Burt 1991). Capitalizing on China's multilevel party-state system and its territory principle, we also proposed an alternative strategy to quantify the degree of structural equivalence on a rank-order scale, which may inspire future diffusion studies to go beyond dichotomous definition of structural equivalence, especially for large collective actors such as companies, local governments, and countries.

Second, our study is one of a few that not only incorporate multiple environmental contexts but also focus on their interaction. We distinguished two types of contextual effects, the spatial effect of geographic proximity and the nonspatial effect of political proximity. Researchers have previously speculated that the diffusion effect of geographic proximity is likely to diminish in the presence of such nonspatial factors as structural equivalence (Wejnert 2002). Some research has indeed compared the relative strengths of geographic proximity and structural equivalence and concluded that the latter is more influential (Strang 1990). We obtained similar results in the sense that, compared with the effect of political proximity, the effect of geographic proximity was less likely to be statistically significant across different event history models. However, the estimates of the interaction effect between geographic proximity and political proximity from different models revealed a drastically different pattern in the context of China's GLF. It was not the case that the spatial effect of geographic proximity was attenuated by the effect of political proximity or vice versa. Instead, the two contextual effects did not act alone but reinforced each other such that the diffusion of exaggerating grain yields was mostly driven by the action of doubly adjacent counties that were closely connected in both geographic and political space. It is worth noting that in the subsample analysis, the significant interaction pertained only to type A1 neighbors (first-order political proximity), among whom the most intensive peer competition took place, but not type A2 neighbors (second-order political proximity). Echoing an earlier review (Wejnert 2002), these findings together call for future research attention to the interactive impact of contextual variables, in order to better understand the mechanisms of social diffusion.

Third, the territory principle of China's party-state hierarchy allows us to conceptualize political proximity as a gating function that delineates the geographic boundary within which the diffusion effect of geographic proximity is most effective. The coincidence of political and geographic boundaries in this study highlights the importance of spatial thinking in social science research that emphasizes a joint investigation of the interrelated yet distinctive roles of different spatial components (e.g., proximity, boundary, and scale) in shaping the social process (Voss 2007; Logan 2012). As mentioned above, the most robust diffusion effect across different event history models pertained to the interaction between geographic proximity and first-order political proximity. In other words, the spatial effect did not transcend the geographic boundary of shared immediate superior administration. Alternatively, within the upper-level administrative boundary, peer counties in closer geographic proximity mattered more than distant ones. Therefore, treating proximity and boundary as independent spatial structures may lead to biased results. To the extent that social actions are likely to take place in multiple spatial dimensions (Leitner, Sheppard, and Sziarto 2008; Nicholls, Miller, and Beaumont 2013), we can be in a stronger position to understand social diffusions by encompassing all the relevant spatial components in our theoretical and analytical models.

Finally, this study contributes to the political science research on contemporary China. Existing studies of local officials' career incentives and mobility in authoritarian regimes usually treat bureaucrats as self-interested subjects who act independently from one another while seeking the approval of their superiors, even though their theoretical models more or less assume certain forms of peer influence (Walder 1995; Li and Walder 2001; Tsai 2007; Kung, Cai, and Sun 2009; Kung and Chen 2011). Building on the political economic literature on China's bureaucratic history (Xie and Brown 2011), multilevel political hierarchy (Edin 2003*a*, 2003*b*), and the GLF campaign (Goldstein 1991), we are among the first to explicitly model the peer influence and the resulting spatial diffusion process of agricultural falsification, thereby providing a new perspective for future research on bureaucratic behaviors and consequences.

It is important to keep in mind that not all local cadres were homogeneously seeking promotion or radical during the GLF. Local cadres have long mediated between local interests and central authority in the Chinese system of governance (Xie and Brown 2011). In the summer of 1958, some local cadres were certainly acting as Mao's most loyal and politically zealous agents in seeking promotions, others jumped on the bandwagon for fear of sanction, and still others refused to implement misguided policies in order to protect the livelihood of local peasants. In fact, our data showed no high-yield agricultural satellites in many counties (see fig. 1 and table 2), suggesting that the cadres in these areas had incentives different from seeking promotions. Even at the height of the GLF, some local cadres were willing to report famine conditions to their superiors at the risk of being sanctioned (Walder 2015). In Sichuan Province, Bramall (2011) observed marked spatial variation in the GLF famine mortality rates between counties within the same prefecture. He argued that this variation could only be explained by differences in local cadre responses to central and provincial government initiatives, given the structural and locational similarities between these counties.

Future research is needed to gather better historical data and examine the heterogeneity in local cadres' incentive structures and political behaviors. In particular, we need more specific data on the composition of local cadres and their pre-GLF careers to determine the extent to which the heterogeneity of local bureaucrats changed the reporting behaviors and finally affected the famine outcome. In theory, those who competed for promotions might be more likely to exaggerate high yields earlier, while those who simply wanted to be shielded from political sanctions might be more likely to do so later. Without any direct or indirect measure of local cadres' intents, we cannot definitively identify different types of cadres and their distinct contributions to the diffusion of high-yield satellites.

Historical research on diffusion among collective actors is often bounded by the scope of the data available. The current study is limited by several aspects of the data. First, we cannot directly observe the interpersonal ties or contacts between local cadres, which limits our capacity to definitively pinpoint the specific mechanisms underlying the spatial effect (geographical proximity), nonspatial effect (political proximity), and their interaction. Similarly, we are unable to measure the vertical communications between lower- and upper-level cadres either directly or indirectly. Thus, we cannot explicitly model the vertical diffusion process in which upper-level cadres pressured their subordinates. Second, we chose counties as the units of analysis mainly because they are the lowest-level units available in our data. However, towns, people's communes, or other lower-level entities are probably more appropriate choices from the theoretical perspective.

Third, we rely on the *People's Daily* as the sole data source to measure the events of interest, which is subject to selection bias for several reasons. Newspapers in general may selectively report events—not reporting on all events that actually occur or only reporting the events that are considered newsworthy in the current media attention cycle (Earl et al. 2004).

As a result, the events reported in a newspaper may not comprise the entire population or a sample that is representative of the population. In our case, the exaggerations of high grain yields published in the *People's Daily* were likely the most salient events across the country. Future data collection and validation from other sources are needed to better address the potential problem of reporting bias, and caution is warranted in interpreting our results.

Finally, we are limited in our ability to draw causal inference, let alone empirically identify the specific causal mechanisms. Similar to other quantitative analyses of China's political economy in the 1950s and 1960s (Yang et al. 2014; Walder and Lu 2017), the best we can do is to test the empirical implications of our theory in terms of statistical correlation rather than causation. A further complication is that political proximity overlaps with geographic proximity, making it impossible to fully adjudicate between the two. However, we exploited the geographic discontinuity among counties within the same prefecture (or province) and the political discontinuity among geographically adjacent counties located in different prefectures (or provinces) to partially separate the influences of geographic proximity and political proximity. When we restricted the sample to counties that have at least one geographic neighbor and one political neighbor, we found that neither geographic proximity nor political proximity alone could explain the diffusion process.

Despite these limitations, the findings from this study have important implications beyond the historical context of the 1958 GLF campaign. To date, China's multilevel political hierarchy has remained largely unchanged. Promotion-seeking local cadres are still incentivized to signal their political loyalty and competence to their superiors by adopting radical measures, regardless of potential long-term repercussions. One prominent example pertains to falsified official statistics of China's gross domestic product (GDP) and other economic indicators since the early 1980s. Provincial governments are under enormous pressure to meet the economic growth targets set by the central government. When the actual economic performance falls short, provincial leaders, local statistical bureaus, and even state-owned enterprises resort to exaggerating economic output data (Holz 2002). Data falsification has become such a norm that the sum of the local GDP reported by provincial statistical bureaus often exceeds the national GDP published by the National Bureau of Statistics (Holz and Lin 2001). Given the pervasive practice of exaggerating local GDP, the National Bureau of Statistics has completely rejected provincial data on economic growth since 1998 (Rawski 2001). Cai (2000) has suggested that the prevalence of falsifying government statistics among local officials in the economic reform era can be traced back to the exaggerations of agricultural production during the GLF. Fisman and Miguel (2007) found that the corruption norms in diplomats' home countries affected their corruptive behaviors on foreign territory. In line with their theory of the lasting effect of a corruption norm, it would be interesting to empirically examine, in future research, whether launching high-yield satellites in 1958 cultivated a culture of lying that in turn led to falsifying China's official statistics in the reform era.

Our theory and empirical findings may also inform diffusion studies in other settings where human institutions are hierarchically structured along geographic lines. For example, in the Atlanta Public Schools (APS) district, at least 178 teachers and principals at 44 out of 90 elementary and middle schools were alleged to have corrected students' answers to increase scores in state-administered standardized tests in 2009. However, the rate of cheating was much lower in non-APS schools in Georgia where the same test was given in 2009. An investigation by the Georgia Bureau of Investigation (2011) concluded that the widespread cheating in the APS district was driven by the unrealistic targets of improving students' achievement set by the superintendent, Beverly Hall, and her administration. Teachers and principals were under enormous pressure to choose either cheating to meet the targets or failing to meet the targets and losing their jobs. It would be interesting in future research to examine whether our theory is useful for explaining the diffusion of cheating in Georgia's 2009 state test.

Looking beyond the scope of social diffusion, the relationship between physical space and social fabric in general may have changed as modern telecommunication continues to expand. However, it would be premature to completely ignore the impact of spatial structure on social phenomena as long as human actions and interactions occupy concrete space. With our study situated in China's unique context, we hope to inspire future research into the complex intersection between spatial structure and social process in other settings.

APPENDIX

TABLE A1
FREQUENCY DISTRIBUTIONS OF EXAGGERATING ALL-TYPE FOOD CROP YIELDS AT THE COUNTY LEVEL BY SEPTEMBER 30, 1958

N of Exaggerations of All-Type Food Crops	Full Sample		Subsample	
	N of Counties	%	*N* of Counties	%
0	1,905	85.6	286	85.4
1	210	9.4	31	9.3
2	63	2.8	9	2.7
3	24	1.1	7	2.1
4+	23	1.0	2	.6
Total	2,225	100	335	100

TABLE A2
DESCRIPTIVE STATISTICS OF THE INDEPENDENT VARIABLES

	FULL SAMPLE		SUBSAMPLE	
	%	*N*	%	*N*
Exaggerations of rice/wheat yields in:				
Type A1 neighbors:				
None	71.2	1,584	69.9	234
1	11.6	258	13.1	44
≥2	17.2	383	17.0	57
Type A2 neighbors:				
None	85.8	1,910	79.4	266
1	7.2	161	12.5	42
≥2	6.9	154	8.1	27
Type A3 neighbors:				
None	91.6	2,039	79.7	267
1	4.7	104	11.9	40
≥2	3.7	82	8.4	28
Type B1 neighbors:				
None	58.3	1,297	52.2	175
1	12.3	274	16.1	54
≥2	29.4	654	31.6	106
Type B2 neighbors:				
None	5.9	131	5.1	17
1	4.9	110	4.8	16
≥2	89.2	1,984	90.2	302
Terrain:				
Plain	29.9	665	20.0	67
Hilly	27.5	612	20.0	67
Pasture	4.2	94	7.5	25
Mountain	38.4	854	52.5	176
Hometown of a Central Committee member of the party	6.1	135	7.2	24
Old revolutionary base	8.4	186	11.9	40
Ethnic minority are	16.3	362	20.9	70
High-income county[a]	3.3	74	2.4	8
Region:				
Northeast	10.6	236	8.4	28
Northern coast	8.3	184	10.5	35
Eastern coast	8.2	183	6.0	20
Southern coast	8.7	194	5.4	18
Middle reaches of the Yellow River	14.5	322	17.9	60
Middle reaches of the Yangtze River	16.2	360	19.7	66
Southwest	21.4	477	18.2	61
Northwest	12.1	269	14.0	47

TABLE A2 (*Continued*)

	Full Sample		Subsample	
	%	*N*	%	*N*
	Mean	SD	Mean	SD
County area (km^2)	4,121	10,640	7,465	21,110
Estimated crop yield potential in 1970 (catty/mu)	346	322	287	280
N of type A1 neighbors	3.5	1.6	2.7	1.2
N of type A2 neighbors	1.5	1.7	1.9	1.0
N of type A3 neighbors	.8	1.3	2.0	1.4
N of type B1 neighbors	7.9	5.0	7.8	4.8
N of type B2 neighbors	84.4	44.0	74.6	42.7
Total *N*	2,225		335	

Note.—Descriptive statistics for time-varying variables are reported as of the end of the study period (September 30, 1958). Type A1 neighbors are geographically adjacent counties in the same prefectures, type A2 neighbors are geographically adjacent counties in different prefectures of the same provinces, type A3 neighbors are geographically adjacent counties in different provinces, type B1 neighbors are geographically nonadjacent counties in the same prefectures, and type B2 neighbors are geographically nonadjacent counties in different prefectures of the same provinces.

[a] Annual per capita income above 800 yuan in rural population in 1986.

TABLE A3

Coefficient Estimates from Event History Models of Exaggerating All-Type Food Crop Yields at County Level: Event Debut

	Full Sample		Subsample	
Exaggerations of all-type food crop yields in:				
Type A1 neighbors (ref: none):				
1	.98***	(.19)	1.65***	(.42)
≥2	1.62***	(.17)	1.55**	(.49)
Type A2 neighbors (ref: none):				
1	.49*	(.23)	.17	(.67)
≥2	.06	(.28)	−.54	(.75)
Type A3 neighbors (ref: none):				
1	.29	(.28)	1.56***	(.39)
≥2	.28	(.36)	.01	(.76)
Type B1 neighbors (ref: none):				
1	.87***	(.19)	.57	(.45)
≥2	.88***	(.19)	.32	(.44)
Type B2 neighbors (ref: none):				
1	.67*	(.28)	.44	(.76)
≥2	.76*	(.30)	.06	(.75)
Estimated crop yield potential in 1970 (logged catty/mu)	.33***	(.07)	.02	(.19)
Terrain (ref: mountain)				
Plain	.36+	(.19)	.68	(.54)
Hilly	.44*	(.18)	.38	(.47)
Pasture	−1.01	(.99)	−.22	(1.37)
Hometown of a Central Committee member of the party (ref: no)	.32	(.21)	.69	(.47)
Old revolutionary base (ref: no)	−.11	(.21)	−.40	(.60)
Ethnic minority area (ref: no)	.05	(.27)	.50	(.82)

TABLE A3 (*Continued*)

	Full Sample		Subsample	
High-income area (ref: no)	.15	(.36)	.42	(1.49)
County area (logged km²)	.04	(.06)	−.48+	(.25)
Control for *N* of each type of neighboring counties	Yes		Yes	
Region fixed effects	Yes		Yes	
N of counties	2,225		335	
N of events	320		49	

NOTE.—Robust SEs are in parentheses. Type A1 neighbors are geographically adjacent counties in the same prefectures, type A2 neighbors are geographically adjacent counties in different prefectures of the same provinces, type A3 neighbors are geographically adjacent counties in different provinces, type B1 neighbors are geographically nonadjacent counties in the same prefectures, and type B2 neighbors are geographically nonadjacent counties in different prefectures of the same provinces.

+ $P < .1$.

* $P < .05$.

** $P < .01$.

*** $P < .001$.

TABLE A4

COEFFICIENT ESTIMATES FROM EVENT HISTORY MODELS OF EXAGGERATING ALL-TYPE FOOD CROPS AT COUNTY LEVEL: REPEATED (First–Third) EVENTS

	Full Sample		Subsample	
Exaggerations of all-type food crop yields in:				
Type A1 neighbors (ref: none):				
1	.71***	(.16)	1.15***	(.35)
≥2	1.33***	(.15)	1.62***	(.37)
Type A2 neighbors (ref: none):				
1	.29+	(.17)	.19	(.37)
≥2	−.05	(.19)	.07	(.52)
Type A3 neighbors (ref: none):				
1	.18	(.22)	.72*	(.36)
≥2	.31	(.26)	−.17	(.46)
Type B1 neighbors (ref: none):				
1	.68***	(.17)	.57	(.36)
≥2	.54***	(.16)	.10	(.40)
Type B2 neighbors (ref: none):				
1	.27	(.24)	.19	(.55)
≥2	.47+	(.24)	.07	(.59)
Estimated crop yield potential in 1970 (logged catty/mu)	.33***	(.06)	.12	(.15)
Terrain (ref: mountain):				
Plain	.22	(.17)	.66+	(.39)
Hilly	.27+	(.15)	.36	(.31)
Pasture	−1.28	(.83)	−.90	(.82)
Hometown of a Central Committee member of the party (ref: no)	.17	(.16)	.47	(.44)
Old revolutionary base (ref: no)	−.24	(.17)	−.68	(.46)
Ethnic minority area (ref: no)	.02	(.25)	.63	(.56)
High-income area (ref: no)	.03	(.29)	.91	(1.11)
County area (logged km²)	.03	(.05)	−.36+	(.20)

TABLE A4 (*Continued*)

	Full Sample	Subsample
Control for *N* of each type of neighboring counties	Yes	Yes
Region fixed effects	Yes	Yes
N of counties	2,225	335
N of events	477	76

NOTE.—Robust SEs are in parentheses. Type A1 neighbors are geographically adjacent counties in the same prefectures, type A2 neighbors are geographically adjacent counties in different prefectures of the same provinces, type A3 neighbors are geographically adjacent counties in different provinces, type B1 neighbors are geographically nonadjacent counties in the same prefectures, and type B2 neighbors are geographically nonadjacent counties in different prefectures of the same provinces.

\+ $P < .1$.
* $P < .05$.
** $P < .01$.
*** $P < .001$.

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