Characteristics of Voluntary Behavior in the Neighborhood Commons: The Case of Dog Parks

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Abstract

The neighborhood commons, and dog parks in particular, provide a good laboratory to explore the drivers of voluntarism and trust, as well as the situational and demographic correlates that promote or inhibit voluntarism. This analysis connects a central theme of Ostrom's work on institutions for overcoming social dilemmas to the literature on voluntary actions and the health of small communities. Survey results from more than 500 users of 14 dog parks in the Atlanta area are examined to understand how variation in park and user characteristics predict variation in individual contributions to the commons, including pro-social attitudes and behavior and dispute resolution behavior. Our analysis shows how institutions foster community commons, which are correlated with both voluntarism and the voluntary enforcement of norms on users. These results from a study in the field contribute to a growing literature that explores the circumstances for successful voluntary supply and maintenance of public goods.

Keywords: dog parks, new commons, voluntarism, philanthropy, reciprocity, community, monitoring and sanctioning, institutional analysis

Introduction

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Elinor Ostrom's work has spawned a vast literature that catalogues numerous instances where nongovernmental or voluntary institutions were developed to govern commons and mitigate social problems, such as the tragedy of the commons (Hardin, 1968). Although privatization or centralized government control traditionally has been advocated to avoid commons dilemmas, Ostrom argued that individuals in local communities have great aptitude for finding creative solutions to commons dilemmas that overcome free-riding. Often, these creative (nonprivatized and nongovernmental) solutions involve institutions relying on volunteers. We use field evidence from more than 500 users of 14 off-leash dog parks to generate positive theory regarding the institutional, community, and individual drivers of voluntarism, social capital, and pro-social attitudes and behavior. In addition, we leverage these data to understand how individuals interact with the community around them to contribute to the maintenance of the commons.

Empirical evidence from the field and lab settings suggests that individuals self-organize to create, manage, and protect natural resources and other organizations (Ostrom, 2000). In many cases, averting the tragedy—in consuming or maintaining the commons—depends on at least some users volunteering or acting with broader social interests in mind. One of Ostrom's key findings is that people do not free-ride or act as selfishly as much as the rational actor model would predict. Individuals frequently exhibit pro-social or altruistic behavior. They are willing to sacrifice for "greater good" and often volunteer rather than free-ride (Simon, 1993). Although the circumstances that lead individuals to voluntarily contribute, monitor, and enforce rules to maintain a resource are not well understood (Ostrom, 2000), evidence from lab settings points to trust building from communication (Janssen, Holahan, Lee, & Ostrom, 2010; Ostrom & Walker, 2005) and social preferences that lead to conforming behavior or the "desire to do the right thing." Perceptions of fairness and the establishment of governance rules by resource users allow for improved outcomes, whereas allowing costly punishment improves outcomes in the short term but degrades outcomes in the long run (Janssen et al., 2010).

Bridging the gap between voluntarism and the common goods approach, Lohmann (1989) notes that the rational actor model of economics is inappropriate for assessing the provision of a broad range of nonprofit activities and that the commons is characterized by uncoerced participation, shared purposes and resources, mutuality, and fairness (Lohmann, 1992; Lohmann & Van Til, 1992). Nevertheless, the circumstances that give rise to voluntarism and trust, key ingredients in successful common-pool resource (CPR) regimes, are not well understood. Better understanding the circumstances that promote pro-social behavior and support sustainable and voluntary provision of a public resource hold lessons for voluntary sector studies.

Neighborhood commons, and dog parks in particular, provide a good laboratory to explore the correlates of voluntarism and trust, including situational and demographic factors. We examine variation in park and user characteristics that predict variation in individual contribution to the commons, including pro-social attitudes and behavior, "quasi-voluntary cooperation" (Levi, 1989) (whether rules are enforced and followed by users), and dispute resolution behavior. Although there have been numerous studies that summarize empirical evidence relating to determinants of successful commons management (Ostrom, 2005), off-leash areas provide a rich field setting in which to observe different types of rules, management arrangements, and how these relate to quasi-voluntary cooperation. Of particular interest is evidence from a field setting of factors giving rise to individuals making real sacrifices for a collective good.

In this article, we first explore the individual, institutional, and contextual correlates of a sense of community and, in turn, the relationship between the sense of community and outcomes related to voluntarism and philanthropy. This offers new evidence about where to find pro-social behaviors in the field. We then explore the role that these individual, institutional, and contextual attributes have in voluntary conflict resolution efforts in the commons. These results underscore the importance of voluntary rule and norm enforcement in maintaining institutions (beyond donations of time and money).

Literature Review

Generation of Pro-Social Behaviors

Pro-social actions and attitudes follow from individual, institutional, and contextual attributes of communities. Grønbjerg and Paarlberg (2001) demonstrate that the nonprofit sector and the effort to address social dilemmas are a function of the institutional and contextual environment in which nonprofits operate. Similarly, Wilson (2012) and Torgerson and Edwards (2013) find that variation in individual and community attributes are important drivers in promoting voluntarism. In contrast, Wakefield, Elliott, Eyles, and Cole (2006) find that social interaction, networks, and embeddedness in a community are more important and consistent predictors of pro-social behavior than demographic or neighborhood characteristics. Feeling a sense of community contributes to social capital and provides solidarity benefits to individuals (Adler & Kwon, 2002). Existing research highlights the role that social capital plays in fostering voluntarism and philanthropy (Brown & Ferris, 2007) and in pro-environmental behavior (Jones, Sophoulis, Iosifides, Botetzagias, & Evangelinos, 2009).

Although the relationship between social capital and voluntarism is complex and likely bi-directional (Foley & Edwards, 1999), we expect that feeling a sense of community is generated by institutional characteristics and a precursor of more concrete behaviors such as voluntarism and philanthropy. To explore this hypothesis, we explore the role of individual, institutional, and contextual characteristics in fostering a sense of community and, in turn, the role of community in promoting voluntarism and financial contributions to maintain a local resource.

Most dog parks rely on volunteer labor. Many also rely on financial contributions from the community. Volunteering time or money does not capture all pro-social behavior alternatives, but they are two important components of the maintenance of the resource. These are behavioral metrics of voluntarism rather than attitudes, although our survey ultimately relies on self-reported voluntary contributions.

Quasi-Voluntary Behavior and Enforcement of Rules and Norms

Although it is clear that establishing community, communication, and social capital help maintain institutions, the relationship between monitoring and sanctioning is less clear. Off-leash parks exist under the radar or (for unofficial parks) outside the scope of conventional law enforcement. Yet, they rely on rules and enforcement for sustainability (Matisoff & Noonan, 2012), and some parks' rules are rather evolved even if informal. Furthermore, compliance with and enforcement of rules is essentially voluntary; should there be sharp increases in non-compliance, the coercive apparatus (or lack thereof) would likely be inadequate. In a sense, users of the local commons have the responsibility to monitor those resources and enforce rules. This costly behavior is a type of voluntarism that has enormous implications for the perseveration of social norms and solving the second-order dilemma of institutional maintenance (Ostrom, 1990).

Levi (1989) notes that in situations where compliance with rules is generally high, the overall costs of monitoring and sanctioning are low and the effectiveness of sanctioning and monitoring efforts is high. She terms this state "quasi-voluntary compliance." Whereas Levi assumes the coercive power of a ruler to ultimately enforce laws, we examine the ability of public space users to self-govern and engage in costly (to the individual user) monitoring and enforcement efforts that ultimately lead to a state of quasi-voluntary compliance. That is, we view compliance with the rules of off-leash areas as quasi-voluntary, with periodic enforcement of rules and norms by the users of the resource. Dog parks offer a great opportunity to examine voluntary enforcement activity in the field and not in contrived lab settings. Robust commons regimes often rely on volunteers for monitoring, enforcement, and other maintenance, and dog parks appear to be no different.

Institutional economics suggests rational decision making, monitoring, and enforcement of institutional rules are crucial for the maintenance of the resource and the survival of an institution (North, 1990). Evidence from the field suggests that monitoring and sanctioning may be crucial elements of an institution's design (North, 1990; Ostrom, 1990). And, lab settings provide substantial evidence that individuals will engage in costly punishment that does not align with game-theoretical expectations

(Carpenter, 2007; Falk, Fehr, & Fischbacher, 2005). Previous research in the local commons suggests that sanctioning may have a damaging impact on philanthropy and voluntarism (Matisoff & Noonan, 2012).

We term behavior pertaining to the resolution of disputes as "conflict-related" behavior. Whereas conflicts between users are undesirable, some amount of proactive user enforcement of rules, or action to avoid or resolve conflict, is likely necessary to maintain the commons. We examine five metrics of conflict-related behavior. Two types of behavior involve an individual unilaterally avoiding conflict by moving to another part of the park or by leaving. Two types of behavior are more enforcement oriented: Users ask other users to change behavior, pick up feces, and so forth; or, to leave the park. Finally, we examine rare cases where users call upon third-party security agents to intervene.

Data and Method

General Approach

Variation across parks allows us to connect the institutional design of off-leash areas with the formation of social capital and examine how institutional rules may facilitate trust, mutuality, and voluntarism while controlling for the institutional setting and demographic characteristics of users (Isham, Kolodinsky, & Kimberly, 2006). Furthermore, because all institutions are nested within the Atlanta region, we control for the broader institutional context that might drive trust, mutuality, and voluntarism.

Off-leash areas exhibit institutional diversity. Matisoff and Noonan (2012) provide a more complete discussion on the alignment between park types and CPR theory. Depending on the institutional rules and level of crowding at dog parks, they may resemble pure public goods, CPRs, club goods, or private goods. Some parks are sanctioned and have a list of official rules. Others are informal (and illegal). Some are private—operated by a housing complex, a development corporation, or a coffee shop. Off-leash areas have unique institutional arrangements such as a local rules-in-use that restrict use to members of a specific community, making them akin to club goods. Even as club goods, dog parks face a shirking problem (Prakash & Potoski, 2007) as users can cheat the rules or free-ride on others'

enforcement. Regardless, all dog parks in this study have some degree of local rules, maintained by the users, which reflect collective efforts to provide an institutional response to dog park management. Table 1 lists Ostrom's design principles and how these apply to dog parks.

We test correlates of pro-social attitudes by predicting users' sense of community with individual, institutional, and neighborhood variables. We then explain pro-social behavior (voluntarism and philanthropy) by employing this sense of community as a predictor. Finally, we examine users' unilateral efforts to employ various strategies to monitor and enforce rules and norms. Figure 1 diagrams our model. This approach helps explain the evolution of social norms, quasi-voluntary behavior, voluntarism, and self-monitoring and enforcement of formal and informal rules, bringing new empirical evidence on the correlates of voluntarism to the voluntary behavior literature from a distinctly Ostrom-esque perspective.

Atlanta-Region Dog Parks and Survey Administration

In recent years, dog parks have been the fastest growing type of park in urban United States (El Nasser, 2011). There are more than 575 municipal-designated dog parks in the 100 largest U.S. cities (Trust for Public Land, 2012). Atlanta has only three public municipal-designated dog parks. By comparison, Portland, Oregon, has a similar population and 32 dog parks. In Atlanta, creating and maintaining dog parks is a "grass-roots operation." Groups of dog owners must organize themselves and go through a formal process of proposing a dog park to not only the City of Atlanta but also civic and neighborhood planning associations in a given area. Dog parks in Atlanta must be at least two acres in size, fenced with controlled entrances and exits for separate small and large dog areas, be serviced by drinking water, be properly developed and maintained, and post dog park rules (City of Atlanta, 2013). Other cities in the Atlanta region have similar designation and maintenance requirements, and some dog parks, such as those in Decatur, Georgia, are restricted to only local residents.

We identified seven municipal-designated dog parks, including three dog parks in Atlanta, three dog parks in Decatur, and one dog park in Kennesaw. To obtain greater variation in dog park institutional

contexts, we expanded our search for other types of dog parks. We canvassed neighborhoods, inquired with dog owners, and searched Internet sites popular with dog owners, including Yelp.com, Bringfido.com, and Doggoes.com. We identified 18 additional off-leash dog areas for a total of 25 dog parks. This list includes all of the municipal-designated parks in Atlanta and nearby suburbs in addition to the most popular private dog parks and unofficial dog parks.

Five hundred ten completed surveys were collected from users at 14 different off-leash dog areas. Survey response rate was greater than 90%. We were not able to gain access to several of the residential association dog parks or get permission to sample at a private dog "club" in suburban Alpharetta. The final list and description of the dog parks where surveys were collected are available upon request. Demographic data drawn from the American Community Survey 5-year averages (2008-2012) are matched to each dog park based on the Census block group hosting the park (U.S. Census Bureau, 2013).

Method

We employ multivariate regression and random-effects specifications to leverage variation within and across dog parks. We estimate the model in Figure 1 via ordinary least squares for pro-social attitudes and behaviors and via probits for conflict-related behavior to identify the impact of the same vectors of individual, institutional, and neighborhood characteristics on pro-social attitudes and voluntary behaviors.

Table 2 summarizes the variables used here. Modeling pro-social attitudes and behaviors helps us understand mutuality, reciprocity, and quasi-voluntary behavior. We acknowledge trade-offs in measuring pro-social attitudes and behaviors with a limited set of responses. Although these metrics align closely with concepts of interest and allow a parsimonious approach to testing relationships, these complex concepts are worth unpacking in future research. Ostrom (2000) establishes that individual initiatives to maintain the commons, punish other users, and enforce rules are characteristics of mutuality and reciprocity.

In addition to individual user characteristics, we measure park characteristics, whether a user contributes or volunteers to help maintain the parks, and user perceptions of institutional management characteristics that align with Ostrom's (1990) eight principles of robust CPR management (see Table 1). These principles are translated into a series of Likert-type scale questions (1-7) that measured users' perception of the institutional management of dog parks. For example, users were asked the extent to which they agreed with the statements: "I hold other dog park users accountable for observance of the rules" and "The physical conditions of this dog park are well maintained." These questions align with Ostrom principle 4: "regular monitoring of users and resource conditions." A copy of the complete survey instrument is available from the authors. Institutional characteristics such as whether the park is public or private, and whether it is an official park or unofficial park were coded by the survey administrators. Neighborhood characteristics are measured based on the Census block groups containing the dog parks.

Results

Pro-Social Behaviors

Demographic characteristics

Demographic characteristics of individuals demonstrate that women are more likely to volunteer to maintain the local commons. Older individuals are more likely to volunteer and to donate money. Education is unrelated to any pro-social outcome. Wealthier individuals feel a stronger sense of community, but are not likely to contribute more money or volunteer time. Those with children are somewhat more likely to report volunteering. Frequent users of the park are more likely to feel a greater sense of community, volunteer, and contribute financial resources to the maintenance of the park. Those who use the park to meet friends also report stronger senses of community, more volunteering, and more donating money. Interestingly, those who use the park as a place to meet new people also report feeling a greater sense of community but are somewhat less likely to contribute financially to maintain the park and

are significantly more apt to volunteer. These results highlight that social interaction at the park and history of repeated use are correlated with a sense of community and contributions to the park's upkeep.

Institutional management perceptions

Beyond predictors of a stronger sense of community as an arguably worthy goal in its own right, we observe sense of community as a strong correlate of user voluntarism and financial contributions. This result emphasizes that the solidarity benefits of nonprofits (or other voluntary associations) are associated with the upkeep of a resource. Other indicators of institutional management prove to be important predictors of generating community and the upkeep of the park through voluntarism and charity. Users who report the park as well maintained are much more likely to report a strong sense of community but are not more or less likely to contribute to upkeep, suggesting that having a well-maintained resource is important to facilitate bonding but may inspire as much free-riding as willingness to pitch in.

In contrast, users who perceive they have greater input into rules report more volunteering or contributing money. The causal arrow likely points both ways. These individuals' contributions may "buy" them input into rules. It is also possible that perceiving input into rules provides users of a feeling of ownership and motivation to help upkeep the park. Interestingly, users who report abiding by rules are much less likely to volunteer. It seems possible that adhering to rules is a substitute for volunteering time or, in a sense, being a good citizen exempts users from extra duty.

Across all three models in Table 3, users who hold other users accountable report stronger agreement with a sense of community and pro-social behaviors. It seems likely that those who hold other users accountable tend to feel greater ownership of the resource and, thus, feel a sense of community and contribute to its upkeep. Conversely, the presence of mechanisms to resolve conflicts is not positively correlated with pro-social behaviors. This reflects the ambiguity in the relationship between the upkeep of a resource and dispute resolution, monitoring, and sanctioning.

Park types matter significantly. Unofficial parks, which lack fences or listed rules, score much higher along the sense of community dimension. This result suggests that users of unofficial parks substitute a sense of community as a mechanism for park maintenance and rely on establishing informal institutional rules and norms to replace the role of government or a more formal provider of the resource. Users of unofficial dog parks report less formal volunteering than at official dog parks, perhaps because investing time building or maintaining facilities, for instance, is impermissible at unofficial dog parks. (These parks—or uses of existing parks—are in fact illegal.) Official dog parks, conversely, typically receive little or no maintenance from the city and rely on volunteer labor. (Often, official dog parks are approved only after petitioners commit to self-maintenance of the grounds, which allows resource-strapped parks departments to shift resources elsewhere.) This finding emphasizes the effectiveness of self-organizing and creating self-sustaining institutions, formal or informal, to provide resources.

Similarly, private parks—those operated by an apartment complex or dining establishment—are also able to generate a sense of community that exceeds official and unofficial public parks. Private, for-profit owners succeed in engendering community. These parks do not rely on user voluntarism—perhaps as the private property owner is seen as responsible for the labor to maintain these resources. In contrast, users of these resources are much more likely to contribute financially to maintain these resources (including through their rent or restaurant bill). This result highlights the trade-off between a public resource relying on voluntarism and a private resource relying on fees for upkeep.

Small parks seem less able to generate a sense of community, while one of the two large parks also scored poorly along sense of community. Users at both large parks exhibited less voluntarism. In the context of nonprofit institutions and the provision of local public goods, this suggests that goods must be scaled to an appropriate size to generate a sense of community that leads to solidarity benefits and not so large as to lead to free-riding. Large and small parks appear equally adept at eliciting financial contributions in this sample, with Piedmont Park (which had recently raised funds from users to finance upgraded facilities) an exception.

Neighborhood characteristics

We control for neighborhood median household income and the percent of the neighborhood households who are renters. We find no relationship between pro-social behaviors and income levels of the host neighborhood. Socioeconomic attributes of users might affect pro-social behavior, but the socioeconomics of neighbors explains little here. However, we find that when a park is in a higher rental area, users report less of a sense of community. This may be due to more transitory residents and users, and shallower social connections among them. These results, again, underscore importance of social interaction driving community.

Conflict-Related Behavior and the Maintenance of the Commons

The survey elicited five alternative conflict response behaviors, which range from passive avoidance to active interventions, including calling in authorities. Users moving or leaving the park due to conflict are bearing some personal cost to keep the peace, although they might not be improving or reinforcing good norms. Asking others to behave better, discipline their dog, or leave altogether also comes at some personal cost and risk in the conflict, although it might be vital to establishing or protecting park norms crucial to its sustainability. Across survey respondents, 45% report moving to avoid conflict, 27% report leaving to avoid conflict, 27% report asking others to move, 6% report asking others to leave, and 2% report calling security. Calling security is a particularly rare and extreme conflict response. This alternative stands in contrast with the other more voluntary and informal responses, demonstrated in Table 4.

Results from regressions highlighting individuals' conflict-related behavior allow us to understand the individual-level and institutional-level correlates of conflict avoidance and dispute resolution in a quasi-voluntary setting. Overall, Table 4 reveals several interesting patterns. High-frequency visitors, users who perceive greater dog aggression problems, and those holding others accountable tended to be more likely to have undertaken the various conflict-related behaviors. Conflict

resolution options have fairly consistent predictors. Within the conflict avoidance behaviors (i.e., moved and left), however, other relationships are not so consistent. As the factors explaining the variation in moved differ from left, we see these are distinct alternative responses with different appeals for different people and situations.

Individual and demographic characteristics

Gender, age, education, and children are not consistent or strong predictors of conflict avoidance or more voluntary conflict resolution behavior. Older users, those without children, and those with more education are more likely to call security. Those users are not significantly more or less likely to employ the other conflict responses.

Frequent visitors tend to engage in conflict avoidance and conflict resolution behavior. This strong result applies to all conflict response alternatives except asking others to leave. These users may feel more responsibility for park safety and authority to police "their" park, or benefit the most from an orderly and peaceful park, and thus, they tend to be proactive in conflict resolution.

Those who come to meet new people are not more or less likely to engage in conflict avoidance behavior. In contrast, those who meet friends at the park are more likely to ask others to change behavior or to call security. Wealthier individuals are more likely to call security, but are not more likely to engage in other strategies. In wealthier neighborhoods, individuals are less likely to move to another part of the park, but are more likely to leave. They are also less likely to ask others to leave.

Institutional characteristics and conflict-related behavior

Unsurprisingly, users who perceive dog aggression as a problem are more likely to engage in all types of behavior. Users who believe that there are inadequate mechanisms to resolve conflict are more likely to move or leave, and are more likely to ask others to reform. These users do not perceive dispute resolution mechanisms as adequate and perhaps think the other two mechanisms are unavailable or too costly. Furthermore, users who believe that the rules of the park are clear are less likely to engage in

conflict resolution behavior, especially asking others to change behavior. Those who report that they hold other users accountable for their actions, interestingly, tend to avoid conflict or ask others to change their or their pet's behavior; they may not be more likely to ask others to leave or to call security. Those policing the park may not need actual police.

Users who perceive a strong sense of community at the park are more likely to ask other users to change behavior or leave, but are not more likely to move or leave themselves. Where a strong sense of community exists, users are more likely to unilaterally enforce rules and engage in costly punishment or sanctioning behavior. This sense of belonging leads to removing offenders from the group, rather than oneself leaving or inviting in outside authorities.

Interestingly, official dog parks, with fences and written rules, are no more or less likely to foster monitoring and sanctioning behavior. Private park users are more likely to ask others to leave in case of conflict. Because users pay for these parks, they might tend to feel entitled to ask others to bear the costs of restoring order. The entrance fee might also essentially screen for users more committed to actively enforce and overcome free-riding (Iannaccone, 1992).

Park size does not have a strong relationship with conflict resolution behavior. The two largest parks show disparate tendencies associated with conflict resolution. Piedmont Park users are less likely to leave in case of conflict. Swift-Cantrell Park users are less likely to move to another part of the park but are more likely to leave. They are also less likely to ask other users to reform or leave. These findings may be due to the particular layout characteristics of those parks.

Neighborhood characteristics

In areas with a higher renter population, users are less likely to move to another part of the park but are more likely to leave. They are less likely to ask others to change behavior or leave. Another way of interpreting this is that users in areas with higher homeownership rates are more likely to ask other

users to change behavior or leave, and are less likely to leave themselves. This suggests a willingness to invest in a sort of "neighborhood watch" among homeowners in the neighborhood commons.

Discussion

Where to Find Pro-Social and Conflict-Related Behaviors

Ostrom (1990) highlighted the problem of supplying institutions to govern resources such as dog parks and how solving that social dilemma to design robust institutions can yield successful commons management in a self-reinforcing system. Ostrom's work frames commons management as crucially involving pro-social behavior and voluntary enforcement by users by involving participants in the generation and enforcement of institutional rules. Not all governance approaches enjoy the same success. Better understanding where individuals contribute more to the shared resource—via donations of time or money and via voluntary rule enforcement—remains an empirical challenge especially for "new commons." Tables 3 and 4 illustrate some of these complex relationships.

Because individuals likely choose which parks they visit based on a variety of characteristics (including the sense of community they feel at that particular park), and because self-reported voluntarism is difficult to disentangle from a sense of community, there is likely strong interdependence among our metrics. These relationships urge caution regarding the interpretation of statistical associations from our findings, but our results also emphasize the strength of the relationships among important institutional management concepts, such as the user perception into rules and holding other users accountable, and outcomes of the actions of individuals. Our findings are consistent with previous findings that community formation is a crucial correlate for pro-social behaviors and resource management. Empirically establishing the importance of community in relation to key institutional outcomes in the field is vital to advancing our understanding of how pro-social actions and quasi-voluntary compliance arise.

Results suggest that a strong sense of community functions as a substitute for more formal sanctioning mechanisms and dog park rules. Unofficial parks score higher on sense of community and

contribute money, suggesting that users are able to self-organize, generate a sense of community, and provide local public goods, such as an off-leash area for dogs. However, because establishing official dog parks is largely driven by "grass-roots" mobilization of resources and support, unofficial dog parks may simply capture an earlier stage in the process. That is—a sense of community may breed the trust needed to collect financial donations, mobilize, and eventually establish an official dog park. This resource becomes used by a larger population—including those existing outside of the initial community—and users then report lower levels of community and financial contribution.

Social interaction—through visit frequency, the desire to meet new people, the desire to make friends—appears to be the strongest correlate of feeling a sense of community. Higher homeownership rates are also correlated with this sense of community, suggesting that establishing a greater sense of permanence is associated with a sense of community that is correlated with these other behaviors. In a situation where users self-organize, those who have more permanent ties to the community may be instrumental at maintaining the type of social cohesion necessary to improve management at the park.

Larger dog parks—and in particular the suburban park—are much less likely to be associated with a strong sense of community, again emphasizing that repeated social interaction is a key driver in community formation. Users who report a strong sense of community also report that they abide by rules of the park and hold other users accountable.

It remains difficult to disentangle certain drivers of community from their effects. For example, users who perceive a strong sense of community are more likely to perceive that a park is well maintained. It is not clear if park maintenance is a prerequisite for community or, if a situation arises where community members are attempting to establish a park, they are more likely to believe that it is well maintained because they are more vested in the outcome. Users likely sort and "shop" among dog parks, further complicating matters, although we see sorting processes as further emphasizing users' creation of community through their park selection and decisions about how to behave while there. Furthermore, because we rely on reported behavior and perceptions of voluntarism and philanthropy, our

measurements of voluntarism and philanthropy may not be the same as if there were independent observation of pro-social outcomes.

Participating in Quasi-Voluntary Behavior

We find that predictors of conflict resolution behavior at dog parks are a function of the perception of the problem, the attitudes and beliefs of the users, and the socioeconomic dynamics that surround the dog parks. Users who perceive dog aggression as a problem and inadequate rules or mechanisms to punish users are more likely to move or leave, ask others to reform or leave, or call security. Interestingly, we observe strong asymmetry in the perception between others' not following rules and survey respondents' self-perception of observing or following rules. Only 11 of 510 respondents disagreed with the statement that they abide by the rules. The strong dissonance between how users perceive their own behavior (following the rules nearly all of the time) and how they perceive others' behavior (frequently breaking the rules) highlights a potential difficulty with self-governance and the potential inadequacy of informal mechanisms to resolve conflict.

The institutional type conditions the voluntary conflict resolution behavior that results. Users in areas that are private are more likely to resolve conflict by asking others to leave. Users of areas that are "unofficial" are more likely to resolve conflict by unilaterally leaving the situation. These results suggest that dynamics involved with the private or voluntary (as opposed to government-sanctioned) enforcement of rules vary by institution.

There are also park-specific factors. The suburban Swift-Cantrell Park was much less likely to have users move, ask others to change behavior, or ask others to leave. There were no cases where users called security, but users were much more likely to unilaterally leave in case of an incident. This park also had much lower indicators of "community," emphasizing that when community ties are strong, there are different ways of resolving conflict. Because community is positively correlated with asking others to

leave, it appears that a strong community mentality at the dog park allows users to identify rule violators and asks them to leave.

This dynamic of quasi-voluntary exclusion is likely controversial. It may be socially preferable and necessary to have users enforce rules and norms and ask others to leave when these rules and norms are not being observed. The number of renters in a neighborhood reinforces this perspective. In a neighborhood with more renters, users are much less likely to ask others to leave. The presence of a sense of community and the factors associated with that sense of community seem to be responsible for and consistent with the behavior demonstrated by individual users. This suggests that strong community norms, established by frequent park visits by users to the park, drive conflict resolution at the park.

However, this voluntary enforcement dynamic may resemble vigilantism. There are obvious reasons why societies tend not to rely on voluntarism to maintain the rule of law. But this system of conflict resolution is not blind to park and neighborhood characteristics. The sense of community that allows for self-policing behavior and the enforcement of rules and norms is also sensitive to park and neighborhood characteristics. Very active users, those in neighborhoods with high homeownership rates, and users who worry about dog aggression employ both passive and active forms of conflict resolution. Those who take it upon themselves to create and sustain harmony in the neighborhood commons, interestingly, are not the same as those who call upon the authorities for order. The equity implications of quasi-voluntary behavior and the enforcement of social norms and rules deserve more attention in the future.

Conclusion

These results from a field setting highlight the role of social interaction, which in turn, is correlated with a sense of community and with both pro-social and conflict-related actions. Lab experiments have emphasized the importance of user efforts to establish and enforce the rules of the commons, generating a self-governing institution. These results from the field support these findings and

describe conditions where self-governance is more likely. Having a strong sense of community is related to increased voluntarism and to the unilateral enforcement of rules. Unofficial parks scored much more highly on sense of community, suggesting that a sense of community may substitute for the established rules. This dynamic was supported by discussions with users who acknowledged the need to self-police in the absence of an externally enforced set of rules. These results build nicely on Ostrom's previous work about the critical role of voluntary, pro-social behavior in maintaining the commons.

Social pressure, norms, and quasi-voluntary behavior are crucial components of a well-functioning society. In addition to individual and contextual characteristics, institutional characteristics (and particularly the role of community) play fundamental roles in pro-social and conflict-related outcomes in this case, highlighting the relevance of Ostrom's work for the nonprofit and voluntary studies community.

The strong empirical associations of sense of community and other factors related to individuals' ownership or stake in the park underscore the complex web of interdependence of institutional supply and voluntary compliance and enforcement emphasized by Ostrom (1990). Beyond describing who donates to their dog parks, we identify where users conduct more voluntary enforcement to help "supply the institution." This evidence from the field reiterates a long-standing theme in Ostrom's work: Voluntary, pro-social behavior is indeed possible in the face of a commons, but a second challenge in communities devising and maintaining a supporting institution must also be met.

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Figure 1. Connecting voluntarism with user and contextual characteristics.

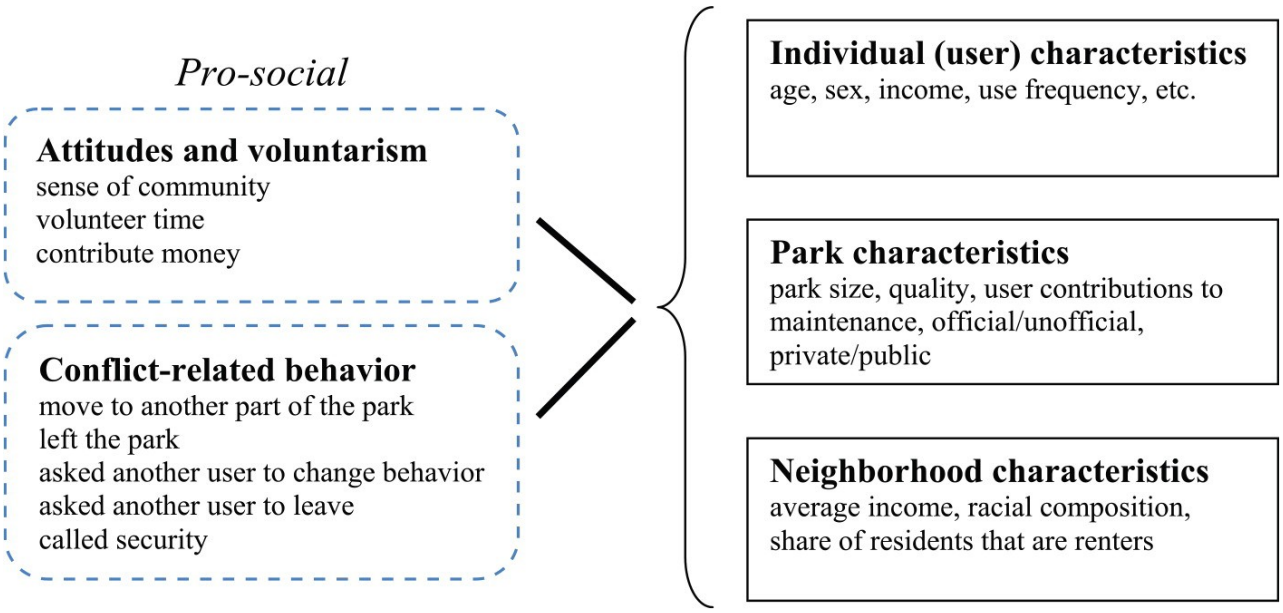

Table 1. Ostrom's Design Principles Applied to Dog Parks.

Table 1. Ostrom's Design Principles Applied to Dog Parks.

Design principles	Examples of application to dog parks
1. Boundaries of users and resource are clear	User eligibility and park boundaries are well defined (e.g., fences, clear separation from playgrounds, ID checkpoints)
2. Congruence between benefits and costs	Beneficiaries' responsibility for clean-up and maintenance (e.g., clean up after your own dog)
3. Users had procedures for making own rules	Users can modify park rules (e.g., separate larger dogs, if needed)
4. Regular monitoring of users and resource conditions	Monitoring done by dog owners (or official monitors are accountable to users)
5. Graduated sanctions	Rule violators punished with increasing severity
6. Conflict resolution mechanisms	Norms or procedures exist for users to resolve disputes at low cost
7. Minimal recognition of rights by government	Users' rules and norms are not challenged or overruled by park officials
8. Nested enterprises	If embedded in a larger park, dog park governance is nested within governance of park

Source. Adapted from Ostrom (1990) and Matisoff and Noonan (2012).

Table 2. Variable Descriptions.

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Variables	Description
Sense of community	User feels a sense of community with other park users (1 = *strongly disagree*, 7 = *strong agree*)
Volunteer	User volunteers for the park (1 = *strongly disagree*, 7 = *strong agree*)
Contribute money	User gives money for the park (1 = *strongly disagree*, 7 = *strong agree*)
Moved	Dummy variable indicating whether user has relocated within park to avoid conflict
Left	Dummy variable indicating whether user has left park due to conflict
Asked other to reform	Dummy variable indicating whether user has asked another user to change their (or their dog's) behavior
Asked other to leave	Dummy variable indicating whether user has asked another user to leave
Called security	Dummy variable indicating whether user has called security or police
Female	Dummy variable indicating whether user is female
Age	User's approximate age in years
Education	User's education (1 = *some high school*, 2 = *HS diploma*, 3 = *some college*, 4 = *college degree*, 5 = *graduate degree*)
Children	Dummy variable indicating whether user has children
ln(household income)	Log of user's total annual household income
Visit frequency	User's weekly visit frequency (1 = 0-1 *visits*, 2 = 2-3 *visits*, 3 = 4-5 *visits*, 4 = 6-7 *visits*, 5 = *more than 7 visits*)
Meet new people	Dummy variable indicating whether user reports meeting new people as a primary reason for visiting
Meet with friends	Dummy variable indicating whether user reports meeting friends as a primary reason for visiting
Park maintenance	Park is well maintained (1 = *strongly disagree*, 7 = *strong agree*)
Input into rules	User has input into park's rules (1 = *strongly disagree*, 7 = *strong agree*)
Abide by rules	User abides by park rules (1 = *strongly disagree*, 7 = *strong agree*)
Accountable	User holds other users accountable for following rules (1 = *strongly disagree*, 7 = *strong agree*)
Conflict resolution	User lacks convenient ways to resolve park conflicts (1 = *strongly disagree*, 7 = *strong agree*)
Official parks	Dummy variable indicating whether it is an official dog park
Private parks	Dummy variable indicating whether it is a private dog park
Small parks	Dummy variable indicating maximum observed park users (dogs or people) ≤ 10
Piedmont Park	Dummy variable indicating whether it is in Piedmont Park
Swift-Cantrell Park	Dummy variable indicating whether it is in Swift-Cantrell Park
ln(median household income)	Log of median household income in park's Census block group
Percent renter	Share of housing units being rented in park's Census block group

Table 3. Impacts of Individual, Park, and Neighborhood Characteristics on Pro-Social Behavior.

Table 3. Impacts of Individual, Park, and Neighborhood Characteristics on Pro-Social Behavior.

Variables	Community	Volunteer	Contribute money
Sense of community (individual)		0.0665* (0.0336)	0.136*** (0.0317)
Female (individual)	0.181 (0.147)	0.229** (0.100)	0.00291 (0.130)
Age (individual)	0.00682 (0.00633)	0.0167*** (0.00530)	0.0312*** (0.00630)
Education (individual)	0.0294 (0.0506)	−0.0723 (0.0833)	−0.0865 (0.0707)
Children (individual)	0.0535 (0.120)	0.169* (0.0855)	−0.115 (0.128)
ln(household income) (individual)	0.197** (0.0664)	0.0222 (0.0784)	0.0875 (0.131)
Visit frequency (individual)	0.151*** (0.0192)	0.0894* (0.0436)	0.0839** (0.0294)
Meet new people (individual)	0.509*** (0.133)	0.0238 (0.163)	−0.273* (0.141)
Meet with friends (individual)	0.305*** (0.0812)	0.341** (0.141)	0.369*** (0.104)
Park maintenance (individual)	0.208*** (0.0649)	−0.0237 (0.0605)	0.0498 (0.0746)
Input into rules (individual)	0.0221 (0.0198)	0.255*** (0.0703)	0.250*** (0.0400)
Abide by rules (individual)	0.0918* (0.0452)	−0.151*** (0.0481)	−0.0750 (0.0482)
Accountable (individual)	0.0855** (0.0353)	0.130*** (0.0332)	0.136*** (0.0316)
Conflict resolution (individual)	−0.0262* (0.0144)	−0.0211 (0.0459)	0.0208 (0.0557)
Official parks (park)	−0.525*** (0.143)	0.321** (0.140)	−0.389* (0.208)
Private parks (park)	1.008*** (0.313)	−0.123 (0.441)	1.382*** (0.389)
Small parks (park)	−0.335* (0.174)	−0.115 (0.193)	−0.111 (0.248)
Piedmont Park (park)	−0.0632 (0.233)	−0.783*** (0.238)	0.513** (0.226)
Swift-Cantrell Park (park)	−1.034** (0.402)	−1.289* (0.719)	−0.371 (0.749)
ln(median household income) (neighborhood)	−0.343 (0.223)	0.0581 (0.328)	−0.322 (0.302)
Percent renter (neighborhood)	−2.795** (1.148)	−0.884 (2.243)	−1.658 (2.049)
Constant	5.563* (3.012)	0.755 (5.202)	2.983 (3.767)
Observations	508	508	508
R^2	.264	.296	.218

Note. Robust standard errors in parentheses.
*p < .1. **p < .05. ***p < .01.

Table 4. Impacts of Individual and Park Characteristics on Conflict Resolution.

Table 4. Impacts of Individual and Park Characteristics on Conflict Resolution.

Variables	Moved	Left	Asked other to reform	Asked other to leave	Called security
Female	0.150* (0.0906)	−0.132 (0.184)	0.104 (0.133)	0.0657 (0.183)	−0.197 (0.149)
Age	−0.000551 (0.00554)	−0.00902* (0.00539)	−0.00234 (0.00733)	0.00346 (0.00881)	0.0411*** (0.0129)
Education	0.132* (0.0699)	0.0538 (0.0841)	−0.0194 (0.121)	−0.0732 (0.0686)	0.698** (0.355)
Children	−0.0160 (0.0736)	−0.102 (0.131)	0.236 (0.226)	−0.0206 (0.159)	−1.712** (0.830)
Visit frequency	0.107*** (0.0412)	0.110*** (0.0313)	0.134*** (0.0439)	0.0836 (0.0567)	0.162*** (0.0439)
ln(income)	0.0172 (0.0645)	−0.0134 (0.0733)	0.116 (0.139)	0.160 (0.103)	0.526*** (0.169)
ln(median household income)	−0.465** (0.217)	0.433** (0.194)	−0.434 (0.294)	−0.605*** (0.235)	−0.645 (1.607)
Meet people	0.0877 (0.190)	0.0355 (0.159)	0.215 (0.273)	−0.0238 (0.237)	0.0252 (0.252)
Meet friends	0.164 (0.136)	0.181 (0.122)	0.394*** (0.138)	0.0284 (0.310)	1.497*** (0.509)
Park condition	−0.0655 (0.0416)	−0.113*** (0.0300)	0.0101 (0.101)	−0.117 (0.0763)	0.00298 (0.171)
Dog aggression is problem	0.206*** (0.0545)	0.277*** (0.0286)	0.174*** (0.0515)	0.154*** (0.0587)	0.423* (0.234)
Punish users	−0.109** (0.0461)	−0.176*** (0.0539)	−0.237*** (0.0700)	−0.0298 (0.0742)	−0.151* (0.0822)
Rules are clear	−0.0510 (0.0491)	−0.0577 (0.0394)	−0.132*** (0.0427)	−0.0659 (0.0688)	−0.0147 (0.0937)
Accountable	0.0847*** (0.0236)	0.100*** (0.0347)	0.228*** (0.0443)	0.126* (0.0746)	0.100 (0.0800)
Community	0.0360 (0.0468)	0.0300 (0.0554)	0.104*** (0.0355)	0.304*** (0.0824)	−0.00131 (0.139)
Official	0.254 (0.209)	−0.341 (0.211)	−0.219 (0.320)	−0.171 (0.231)	0.191 (0.840)
Private	0.0177 (0.307)	−0.329 (0.245)	0.617* (0.362)	1.026*** (0.390)	
Small	−0.268 (0.179)	0.217 (0.200)	−0.105 (0.348)	−0.160 (0.228)	−0.741 (0.871)
Piedmont	−0.0139 (0.261)	−0.641** (0.298)	0.00714 (0.361)	0.110 (0.287)	0.771 (1.226)
Swift	−1.011*** (0.380)	0.968** (0.442)	−1.200 (0.773)	−1.215** (0.538)	
% renter	−2.702** (1.064)	2.233** (0.912)	−3.867** (1.749)	−3.850*** (1.297)	−5.571 (8.972)
Observations	508	508	508	508	364
Pseudo R^2	.127	.219	.244	.175	.479

*p < .1. **p < .05. ***p < .01.