Altruism as an Organizational Problem: The Case of Organ Procurement

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This article presents a social-organizational approach to explaining empirical variation in rates of altruism. The efforts of organizations are mostly responsible for much of the altruism seen today, and the substance of these efforts varies. Although research from social psychology and organizational studies suggests that altruistic action is sensitive to social context, the link between individual and organizational aspects of altruism has not been clearly articulated. In particular, our knowledge of "one-shot," organizationally managed altruism is limited. I suggest that the factors of organizational resources, scope, and persistence are likely to generate higher rates of individual altruism in the absence of long-term relationships that encourage giving behavior. The approach is applied to the case of cadaveric organ procurement in the United States. The analysis highlights the central role of organ procurement organizations (OPOs). Quantitative analysis of OPO procurement rates shows that, while demographic characteristics are important, OPO resources and scope are important predictors of procurement. The findings strongly suggest that the ability of organizations to produce contexts for giving explains a substantial amount of variation in rates of one-shot altruism.

Altruism is a long-standing problem in sociology. However, surprisingly little attention has been paid to two important facts: First, that the incidence of altruism varies greatly; and second, that altruism is structured, promoted, and made logistically possible by organizations and institutions with a strong interest in producing it. These facts are not unrelated. Helping, giving, or caring is systematically elicited from people by organizations that are usually the immediate recipients of individual goodwill or, at least, the necessary brokers for it. Without these organizations, much of the altruism we observe would not happen. Altruism, in short, is highly institutionalized.

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A social-organizational approach to altruism was set out by Titmuss (1971), but his pioneering effort has seen little subsequent development. Instead, theoretical interest in altruism has mainly centered either on its robustness as a heritable trait or on its reality as a psychological motive. In the former case, research focuses on whether altruistic behavior can evolve and survive across generations as altruists compete with selfish agents. In the latter case, research focuses on whether individuals have altruistic motives or identities and, if so, how they acquire them. Evidence from both fields suggests that altruism is a real, and common, phenomenon. The question of why rates of altruism should vary across different organizational and institutional settings has not been well addressed. Either the problem is not immediately relevant to the research program (in studies of evolution) or it must be posed in terms of identifying the real intentions of individual agents (in studies of motivation).

This article reframes the question by considering the literature on motivation together with that on voluntary and nonprofit organizations. I consider altruistic practices in terms of

their frequency of occurrence for individuals on the one hand, and their degree of social organization on the other. Cases where altruism is a rare or "one-shot" event from the individual point of view yet also possess a substantial degree of social organization are an important but undertheorized type in both literatures. I identify organizational features that ought to be associated with higher rates of altruism in such cases and apply them to the case of cadaveric organ procurement in the United States. Organ procurement has not previously been examined in detail from this perspective. As with research on altruism more generally, the emphasis has been on the motives and experiences of individual donors. My general goal is to develop a middle-range approach to determining why rates of altruism vary, highlighting the logistical efforts of organizations in fostering altruism. Results from the motivational literature are put into a comparative context, and theory on voluntary organizations is extended to cases where organizations cannot have had established relationships with donors.

INDIVIDUAL ALTRUISM AND SOCIAL ORGANIZATION

Definitional Questions

In everyday usage, an altruistic act is one motivated by concern or regard for others rather than oneself. Simmons (1991) gives a useful definition: "Although scholars' definitions differ, most would agree that altruism (1) seeks to increase another's welfare, not one's own; (2) is voluntary; (3) is intentional, meant to help someone else; and (4) expects no external reward" (p. 3). According to Sober and Wilson (1998), "The altruism hypothesis maintains that people sometimes care about the welfare of others as an end in itself. Altruists have irreducible other-directed ends" (p. 228).

Operational definitions of altruism are theory-laden, in that different research programs place varying degrees of constraint on what acts should count as truly altruistic. This means there can be reasonable disagreement over how to classify some actions or practices. For example, from an evolutionary perspective, altruism is a behavioral trait. The problem is to say how a behavior that helps others at a cost to oneself could have evolved. This is a question of the reproductive fitness of altruistic agents. Sober and Wilson (1998) note that "evolutionary biologists define altruism entirely in terms of survival and reproduction. A behavior is altruistic when it increases the fitness of others and decreases the fitness of the actor" (p. 17). From a social-psychological perspective, altruism is a disposition or identity. The problem is whether people truly are altruistic or whether their actions are covertly selfish in some way—a question of purity of motive.

These contrasting approaches are not necessarily in conflict with each another—rather, they are concerned with quite different problems. In the evolutionary approach, altruism is treated as (or as if it were) a heritable trait. Research formally analyzes or numerically simulates the reproductive fitness of agents who behave altruistically towards other agents. Classic results from Hamilton (1964) and Smith (1964) showed that altruism is a successful strategy if organisms maximize their inclusive fitness. More ambitiously, Sober and Wilson (1998) argue that multilevel or group-selection mechanisms may favor the evolution of altruism in populations to a greater degree than has generally been accepted by biologists. Trivers (1971) defined the concept of reciprocal altruism, later developed in Axelrod and Hamilton (1981), Smith (1982), and Axelrod (1984).[1] Other studies show how altruistic behavior can be transmitted culturally, in ways analogous to the biological mechanisms of kin- and group-selection (Allison 1992; Boyd and Richerson 1985; Macy and Skvoretz 1998; Mark 2002). These sociological applications of the evolutionary approach examine problems of social order in a general way, with the focus on identifying the survival chances of prosocial behavior. The present article is not directly concerned with these questions; instead, I examine variation in a kind of altruistic practice and take the existence of altruism per se as given.

A direct conflict between the evolutionary and motivational approaches arises only where

[1] The "tit-for-tat" (cooperate first) strategy described in Axelrod (1984) is often thought not to be altruistic, because the cooperator benefits in the long run. There is some disagreement about this: Sober and Wilson (1998: 84) argue that the distinction is not built into a formal model of these processes, but lies instead in their interpretation.

theory demands that ostensibly well-intentioned actions must be selfishness in disguise. For example, *homo economicus* is both rational and wholly self-regarding, so costly altruism is impossible *ex hypothesi*. Apparently altruistic acts must confer some kind of benefit, either directly or simply in the form of a "warm glow." This view of altruism, it should be noted, arises out of the constraints of a particular model of action and not simple facts about the world. More sophisticated rational-choice models need not force this point, and have room for a more recognizable concept of altruism. As Schmidtz (1993) argues, reflectively rational agents (that is, agents who think about the effects of their choices on their preferences) may have reasons to cultivate an altruistic regard for others in the ordinary sense. Having a reason for doing something for someone—even a reason from one's own point of view—does not disqualify the act from being altruistic.

Rather than examine the altruistic authenticity of particular actions, I present a middle-range framework for understanding empirical variation in kinds of altruistic practices in a way that avoids strong assumptions about the motives of individual actors. I begin from the social-psychological conception of altruism as intentional, voluntary, and unrewarded action oriented toward the welfare of others. But my argument here is not in conflict with the general concerns of evolutionary approaches to prosocial behavior, and—apart from suggesting that a narrowly rational-choice view may confuse the issue—it is agnostic on the question of the proper model of individual agency.

Kinds of Altruistic Practice

To provide a framework for the subject, it may be helpful to juxtapose findings from the social psychology of altruism on the one hand, and research on voluntary organizations on the other. The two areas of study are related, but they have generally progressed without much regard for each other. Bringing them together allows us to think about variation in altruism in a new way. Consider the two-dimensional space shown in Figure 1, defined on one axis by the degree to which practices are routine for individuals, and on the other by the degree to which they are institutionalized by formal organizations. The first dimension represents the frequency of altruistic actions from the point of view of individuals. Practices range from rare, one-shot exchanges to common or routine occurrences. The second dimension captures variability in social organization. Practices here range from those that are diffusely or informally regulated to those that are strongly institutionalized and formally managed. We can place acts of altruism within this framework.

Some acts of altruism are neither routine for individuals nor well institutionalized. Much experimental work on motivated altruism is concerned with situations like this, where people have a sudden opportunity to act in one-shot events detached from any strong organizational context. "Bystander intervention" experiments test how subjects react to an unexpected chance to help a stranger who has had an accident, been the victim of a crime, or is otherwise in need of immediate assistance (Latane and Darley 1970; Austin 1979; Krebs and Miller 1985). Studies of help in the context of a relationship are largely absent from this type of study (Simmons 1991). Also absent is a stable organizational context for action; the aim is to test people's reactions when they must make a quick decision whether to help someone.

Other practices, such as simple acts of kindness or consideration, may be habitual for many individuals or a common part of their lives, but they are not managed by formal organizations. Social theorists have pointed to a general norm of reciprocity that grounds actions of this sort (Gouldner 1960; Granovetter 1985: 489–90). Research has examined the possibility that empathy is a general human trait underlying these sorts of actions (Davis 1996; Batson 1987; Hoffman 1981). A related line of research documents actions that cannot reasonably be called self-interested (Oliner and Oliner 1988; Monroe 1998). This approach emphasizes extraordinary cases of altruism rather than the everyday variety. (These studies have come about partly in response to the rational-choice critique mentioned earlier: the researchers are interested in finding cases of altruism that cannot reasonably be construed as selfishly motivated.)

Social organization is minimal in both of these forms of altruism, extending at most to the conventional or routine activities of individuals. But most of the altruism we observe in modern societies is more likely than not to have a strongly institutionalized aspect, with staffed organi-

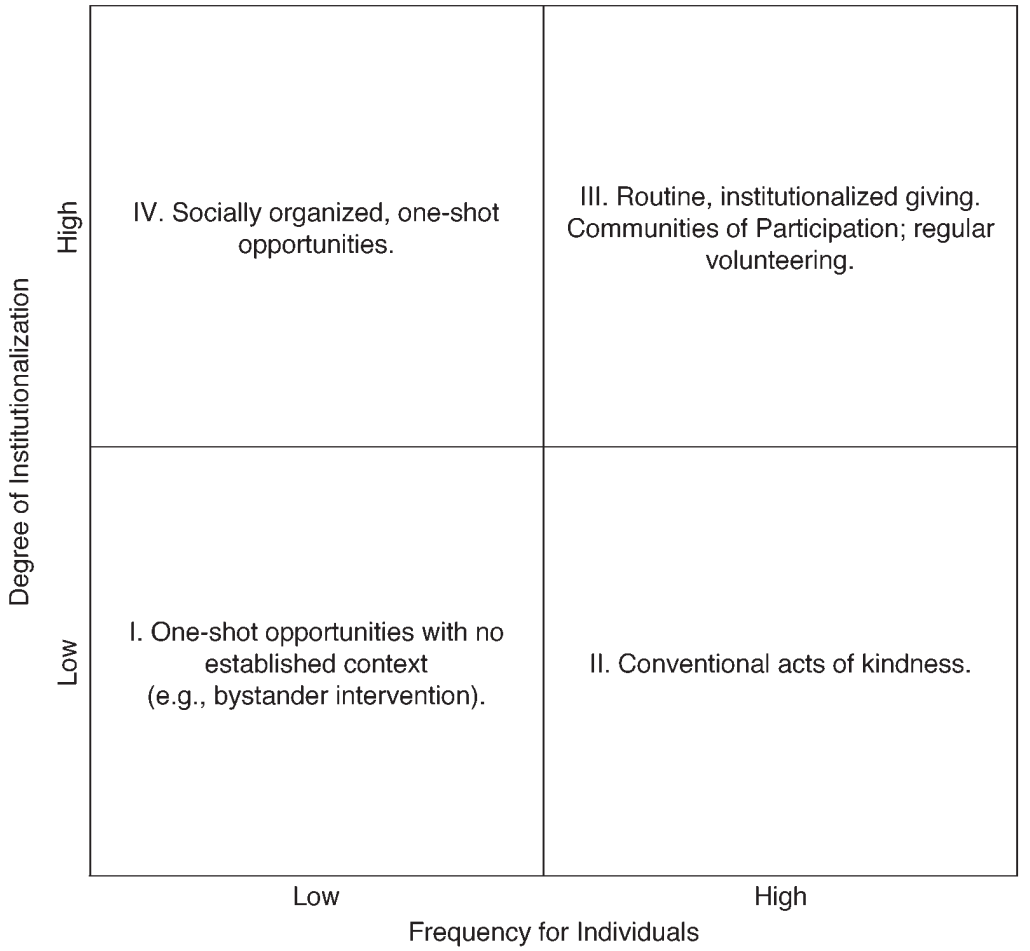

Figure 1. Kinds of Altruistic Practice, by Individual Frequency and Degree of Social Organization.

zations working to produce contexts in which it can happen.

Research on voluntary organizations examines part of this social-organizational dimension. In the United States, many nonprofits operate in environments subject to considerable uncertainty over sources of funding, whether governmental or private (DiMaggio and Anheier 1990; Grønbjerg 1993). Much recent research has analyzed the structuration of organizational populations in light of these constraints. Organizations have reacted strategically in various ways to these circumstances (Clarke and Estes 1992; Oliver 1991); they may, for example, co-opt competitors (Galaskiewicz and Bielefeld 1998), diversify into less competitive areas (Alexander 1998) and attempt to differentiate themselves from competitors (Barman 2002). Although studies at the organizational level have tended to focus on questions of survival and competition (usually for grant money), some have examined how routine altruistic practices are managed by organizations. This is the third case shown in Figure 1, where both the degree of social organization and the frequency of individual practice are relatively high. Studies of rates of charitable giving find that having effective "communities of participation" is the best way to channel social norms, prior dispositions, or available resources into actual donations (Schervish and Havens 1997). Similarly, ethnographic evidence shows that charitable acts and volunteering are common when they are embedded in the social structure of a community (Eckstein 2001), but at the same time effective organizations efficiently

recruit and carefully manage donors (Ostrander 1995). Frumkin (2002) notes that "[w]hile volunteers remain an important engine driving nonprofits, most nonprofits use professionals to manage volunteers, rather than using volunteers to manage their organizations" (p. 102).

Theory and research from the social-psychological and organizational literature, then, has focused on these three kinds of altruistic practice: one-shot opportunities with no organizational context; conventional or routine actions, also with little in the way of formal social organization; and repeated giving managed by organizations. The fourth variety suggested by our typology—one-shot opportunities for altruism in socially organized contexts—has received comparatively little attention. This is not to say that the logistical aspects of altruism have gone wholly unnoticed: research does find that social-organizational context directly affects the likelihood of altruism. In particular, the importance of direct requests to potential donors or helpers is well established. Oliner and Oliner (1988) found that rescuers of Jews were more likely to have been directly asked for help than nonrescuers. Drake, Finkelstein, and Sapolsky (1982) found that people were more likely to give blood if they were asked directly (see also Piliavin and Callero 1991). The same is true for donations of money to charity (Clotfelter 1993; Hodgkinson and Weitzman 1992; Jencks 1992; Schervish and Havens 1997).

Despite the recognition that direct requests increase the likelihood of altruism, however, the relationship between organizationally produced contexts for giving and variation in rates of individual altruism remains underexplored, particularly in the case of one-shot events. The link between the logistical effort of organizations and the action of individuals is generally missing in studies of bystander intervention (where there is no organization) as well as in the literature on voluntary organizations (where the focus is on establishing patterns of giving, or more often on field-level processes of organizational competition). Thus we find an empirical and a theoretical gap in the literature. Empirically, we know little about altruistic practices that are one-shot experiences for individuals and are also socially managed by organizations. Theoretically, we should identify the particular features of the social context or organizational environment that might explain variation in such altruistic acts.

Learning more about one-shot, socially managed exchanges is important. Recent studies of altruistic practices such as blood donation (Healy 2000), together with those on cognate activities such as voluntary association (Salamon and Anheier 1994) and civic participation (Skocpol, Ganz, and Munson 2000), develop the general view that "involvement in volunteer activities does not simply spring from already constituted social groups or from aggregated individual characteristics" but is structured by institutions (Schofer and Fourcade-Gourinchas 2001, 807). This argument is counter to the view that such practices are to be explained by individual-level characteristics or value orientations (Almond and Verba 1963; Inglehart 1997; Knoke 1986). One-shot exchanges would seem to be the most likely case where this argument would *not* apply—where either the distinctive characteristics of individual altruists or the motivating force of generalized norms would be most important. But this need be true only if one-shot exchanges must by definition lack an institutional context. This is a plausible assumption, as the degree of repeated or routine action is usually thought of as the mechanism of institutionalization rather than as potentially orthogonal to it. By separating the frequency of altruistic practice at the individual level from the degree to which contexts for giving are socially organized, however, we gain leverage on the question of why rates of different kinds of altruism vary. Empirically establishing the organizational basis of one-shot altruistic exchanges thus serves two purposes. First, it extends theory on the organizational and institutional sources of volunteering and participation to a challenging case. Second, it connects the problem of explaining individual altruism, which has been dominated by social-psychological explanations, to wider debates in economic and political sociology about the institutional sources of individual actions and identities.

Logistical Aspects of Altruism

From a social-organizational perspective, one-shot altruistic acts are distinguished by the logis-

tical problems that organizations must solve in order to create a viable context in which giving can happen. Variation in these efforts ought to generate variation in rates of altruism, independent of the characteristics of the individual donors. Just as a sale made by someone in a market is necessarily also a purchase made by someone else, donation is also necessarily procurement. Organizations attempt to routinize and maximize the production of procurement opportunities. Even though these may be one-shot experiences from the individual point of view, they can be well institutionalized from the procuring organization's perspective.

Although the literature on charitable giving suggests that asking directly makes it more likely that individuals will donate, it offers little guidance as to what organizational features will matter in this regard. I suggest three kinds of logistical effectiveness: resources, scope, and persistence. *Resources* should be positively associated with higher rates of procurement because larger, better-funded, or better-staffed organizations will find it easier to generate opportunities to give. *Scope* can be thought of as the reach, or spread, of a procuring organization across the range of potential sites where donors present themselves. Organizations with broader scope will be present in more places where potential donors are likely to be found. Resources and scope are related but distinct metrics, as an organization may be large or well funded but narrow in focus, or vice versa. Finally, *persistence* measures the degree to which an organization will pursue a potential donor once the opportunity is discovered. More persistent organizations should be more successful at procuring donors.

I test these hypotheses using the case of cadaveric organ procurement in the United States. This case is useful and important for a number of reasons. The decision to donate is a one-shot exchange from the individual's point of view. The organizations that manage the process are not in direct competition with one another for funds or donors, so complicating field-level forces are not directly relevant. The logistical forces at work are thus clearer than in cases where giving is bound up with well-established social relations. In addition, organ donation is a canonical example of individual altruism: the idealized individual organ donor is a strong trope in public discourse and a stock example in social theory. A social-organizational treatment of organ donation extends our general understanding of the sources of variation in altruism and contributes to our knowledge of an increasingly common medical therapy.

THE CASE OF ORGAN PROCUREMENT

Most organs transplanted in the United States come from cadaveric donors.[2] A report from the General Accounting Office (1993) describes the process:

> Organ donation is dependent on voluntarism and generosity as well as solicitation and decision-making at a time when family members are under the stress of bereavement. Typically this process begins at a hospital when a patient is identified as a potential organ donor. . . . Once a potential organ donor has been identified, the patient's family is contacted by a staff member of either the hospital or the OPO [organ procurement organization] and the family is given the opportunity to donate the deceased's organs. If the family consents to donation, OPO staff coordinate the remainder of the procurement activities, including recovering and preserving the organs and arranging for their transport. (pp. 17–18)

Note that it is the next of kin who makes the decision whether to donate the person's organs. Cadaveric organ donors have usually died suddenly, either from a serious nonaccidental injury (such as a brain hemorrhage or stroke) or from injuries sustained in a violent accident (such as a motor vehicle accident or gunshot wound). Whether the deceased carried an organ donor card may affect the family's decision to donate. But in general OPO staff defer to the choice of the next of kin, who decides whether to give.[3]

Donating the organs of a recently deceased relative is a difficult choice. The decision is not

[2] Kidneys are the main exception. An increasing number is obtained from living, related donors. Note that I do not address the question of commercial trafficking in organs here. On this topic see, for example, Scheper-Hughes and Waquant (2002), Scheper-Hughes (2000), and Cohen (1999).

[3] The extent to which OPOs actively draw attention to the wishes of the deceased is an empirical question, discussed below with respect to variation in OPO procurement policies.

straightforward. Donor families do not know who will benefit from their choice; the vast majority never learn more than the gender, age, and approximate geographical location of the recipient. In addition, those deciding to donate receive no reward. In short, the decision to donate satisfies our definition of altruism in that it is an intentional, voluntary, unrewarded action that seeks to increase the welfare of others (strangers, in this case).

Most research on organ donation, like the literature on altruism generally, has focused on questions of individual motivation and cost. The focus has been on discovering the sources of opposition to donation and ways of overcoming such opposition. Refusals have been found to be due to bad information or myths about the donation process (Gallup Organization 1993). Irrational beliefs and fears that many people have about organ donation may be responsible for keeping the procurement rate down (Prottas 1994). Thus, for those working with a concept of altruism as motivated action, the issue is treated as an individual-level problem whose solution lies in understanding (and perhaps adjusting) the motives of potential donors. A further parallel with research on motivated altruism in general is the discovery (and rediscovery) of the importance of situational factors to donation. Simmons, Marine, and Simmons (1977) found that kidney donors were more likely to have been asked in person to give than nondonors. Zimmerman et al. (2000) found that female relatives were more likely to donate a kidney than male relatives, possibly because women were more likely than men to be asked to donate. In the case of cadaveric donors, the importance of the request process and the need to take care in asking relatives to donate their next of kin's organs have been recognized for some time (Verble and Worth 2000; Ehrle, Shafer, and Nelson 1999; Gortmaker 1998). There are few studies, however, of the logistical role of OPOs in the process of organ procurement, outside of research on the moment when consent is requested.[4]

[4] But see Klassen et al. 1999, Siminoff and Nelson 1999, and Wendler and Dickert 2001 for important exceptions.

The Social Organization of Organ Procurement

Some background on the procurement system is necessary. Through the 1960s and 1970s, it was taken for granted that human organs belonged to the surgeons who had removed them from donors, and these surgeons decided who received organs for transplant on the basis of whatever ethical and clinical criteria they saw fit to apply (Prottas 1994). The federal government overhauled the system in 1984 when it passed the National Organ Transplant Act. Under this law, human organs must be given as gifts in the United States. Organs are considered to be a public good belonging to the state; they cannot be sold. The United Network for Organ Sharing (UNOS) oversees the activities of OPOs, who help make up its membership. Besides the OPOs, the other two main components of the transplant system (and also members of UNOS) are about 60 independent histocompatibility laboratories and about 270 hospital transplant centers. The labs carry out the tests that allow compatible organs and patients to be matched up; the transplant centers, of course, are where the surgery actually takes place.

Today, a national network of organizations locates as many potential donors as possible, secures voluntary consent from the next of kin, and distributes the procured organs to patients on waiting lists in eleven regions across the country. In 1997, there were sixty-one OPOs operating in the United States. Each one is able to procure, store, and deliver organs to transplant centers, where patients register on waiting lists. Each one is responsible for procurement within a particular area. OPO borders are drawn at the county level and may cross state lines. In addition, a few OPOs administer noncontiguous areas. Figure 2 shows the OPO boundaries in the United States.

OPO Resources, Scope, and Persistence

How might variation in the donor procurement rate of OPOs be explained? Successful procurement depends in part on logistical effort—that is, the process of locating potential donors, creating opportunities to give, and securing consent. I have argued that three organizational features help determine the success of these efforts: resources, scope, and persistence. The

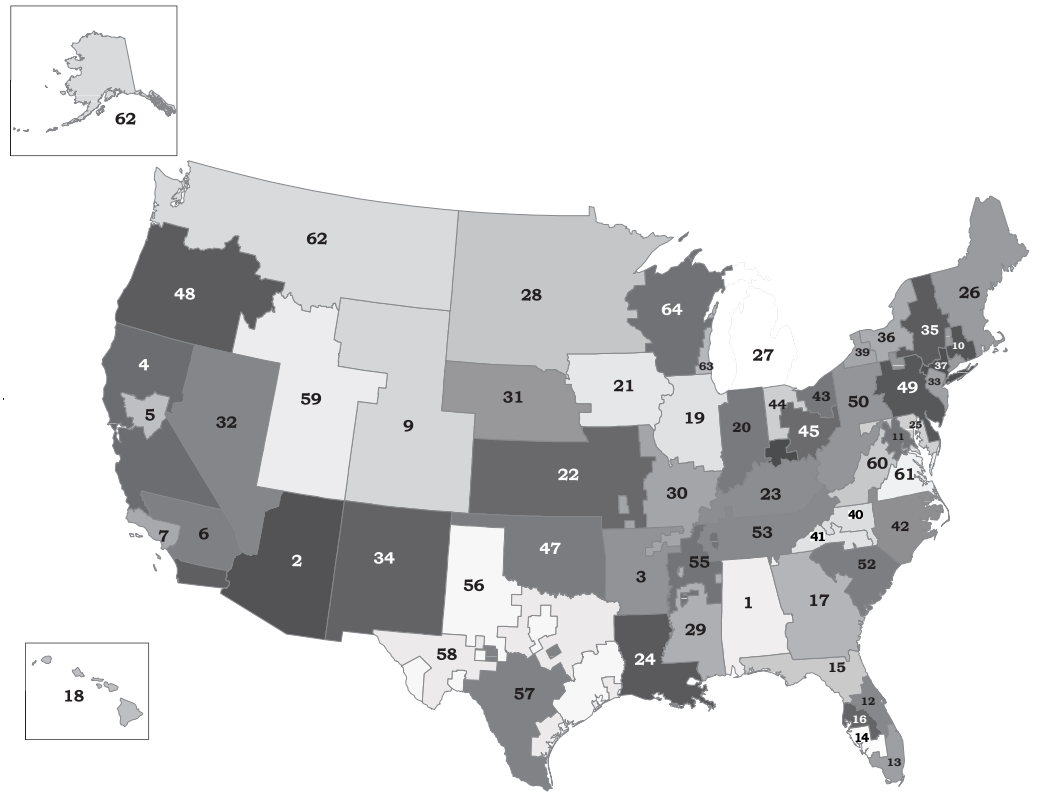

Figure 2. OPO Boundaries in 1997.

Note: Shaded areas mark the catchment areas of different organ procurement organizations (OPOs), which are identified by number.

first of these features for OPOs is suggested by their administrative spending per annum. When measured relative to the number of potential donors, OPO spending indexes the resources that the organization brings to the procurement process. Donor procurement is a resource-intensive procedure requiring substantial coordination. The OPO (or its agents) must identify potential donors, determine that brain death has occurred, contact and obtain consent from the next of kin, and then recover and preserve obtainable organs. Time is of the essence in this process. Resource-rich OPOs, on average, would be expected to be more successful in donor procurement than those with fewer resources.

OPOs are not the only players in the procurement process. Almost all deaths that lead to procurement occur in hospitals. The scope of the organization across hospitals is therefore of some importance; Klassen et al. (1999) found that hospitals play a key role in the procurement process. In some cases, the OPO has a staff member working at the hospital. More often, a member of the hospital staff is responsible for contacting the OPO to let the organization know that a potential donor has become available. OPOs may make referral agreements with hospitals. The more hospitals an OPO has referral agreements with, the greater its scope and the more donors it is likely to procure.

OPOs also vary in their procurement policies and consent practices. Donor families either give or refuse consent for donation (Klassen and Klassen 1996), and it may be assumed that successful organ procurement is related to strategies adopted by OPOs. Families rarely suggest donation on their own; Powner and Darby (1999) found that "educational interventions for health care professionals and a coordinated requesting process that includes the organ procurement organization and hospital personnel

result in a higher number of donations" (p. 1225). Requesting procedures may include the presence of racial or ethnic minority staff to discuss procurement with minority families, the presence of training programs, and the involvement of medical social workers and clergy in the procurement process (Siminoff et al. 1995). The consent process is a delicate one, and OPOs differ in their policies about asking families or next of kin to donate. If some OPOs are more willing than others to, for instance, mention the wishes of the deceased, this may affect the outcome. Wendler and Dickert (2001) found substantial variation in consent policies. Consent policy may be taken as a measure of organizational persistence. The expectation is that the stronger the stated willingness to procure under adverse circumstances, the higher the procurement rate.

Demography of Procurement

Successful procurement is not simply a function of organizational factors, of course. Because they administer geographical areas with widely varying populations, OPOs' procurement rates are affected by features of their catchment area. Some populations are more likely than others to yield potential donors regardless of the social organization of the procurement system. It is important to control for these background forces. The research literature on organ donation and donor motivation points toward a number of important demographic variables. Specifically, population density, racial composition, the poverty rate, and the degree of educational attainment within an OPO's catchment area should all affect the number of potential donors.

Population Density. Some OPOs administer relatively small, densely populated regions. Others service much larger, more sparsely populated areas. Because concentrated populations are easier to manage and are more likely to provide opportunities for donation the procurement rate should rise with population density.

Race. Support for organ donation is known to vary by race; African-Americans are less likely to donate than whites (Ehrle et al. 1999). It is unclear whether this is due mainly to beliefs that the transplant system is unfair to minorities (Kasiske et al. 1991), a more general distrust of the medical system (Randall 1996), or ineffective methods of request on the part of OPOs (Gortmaker 1996). Recent studies have discovered evidence that African-Americans face institutionalized barriers to organ transplantation. African-American patients are much less likely than whites to express an interest in, be listed for, or receive a transplant (Alexander and Seghal 1998; Kasiske et al. 1991). This suggests that lower rates of donation and transplantation among African-Americans are not simply a matter of irrational individual belief, but may reflect a more structural exclusion from the medical system. The expectation is that the higher the black population within an OPO's service area, the lower the procurement rate.

Poverty. The logistical demands of donor procurement begin at the point when a person becomes a potential donor. Once the initial event happens—a car accident or a shooting, for example—the victim must be found, quickly brought to a hospital, and placed on a ventilator. The longer the gap between initial injury and subsequent hospitalization, the less likely it is that procurement will be successful. OPOs that serve wealthier counties are more likely to have the necessary resources and facilities available to them (and the hospitals they work with) to successfully manage this task. OPOs serving poorer counties will tend to procure fewer of the potential donors that become available to them.

Education. Survey data show a higher level of support for organ donation among more educated people (Gallup Organization 1993; Southeastern Institute of Research 1994), though there is no direct evidence that this translates into consent to procure when the occasion arises. There could be a sizable gap between abstract support for organ donation and the actual decision as next of kin to allow procurement to go ahead. But we should still expect that OPOs serving more educated populations to do better on average than others.

Unmeasured Factors. A number of other features of OPO catchment areas might have an effect on the procurement rate; their effect is not estimated in my analysis.

First, the age distribution of the population might be a factor. In the early days of organ transplantation, surgeons were reluctant to use the organs of older potential donors. An OPO with a disproportionately older population might therefore be expected to procure fewer donors. As surgical techniques improved and the organ shortage worsened, however, transplant teams have drawn on as much of the available pool as possible. In 1997, 19.7 percent of cadaver donors were aged 17 years or less; 52.3 percent were aged 18–49; and 28 percent were aged 50 or older. In exploratory analyses, the proportion of the population aged between 5 and 60 was not associated with the procurement rate ($r = -0.14$).

Second, religious participation and affiliation might also affect one's likelihood of supporting donation. Existing research on religion has focused on the theological or traditional objections some religions have or have had with organ donation (Twersky, Gold, and Jacob 1991; Kelly and Wiest 1991). There has been no research on whether the geography of religious affiliation drives variation in donation rates. The literature on religious attitudes toward organ donation might suggest that areas with Jewish, Conservative Catholic, and some Protestant denominations will have lower donation rates. I used county-level data on religious affiliation and activity to examine whether there was a link between religion and procurement. The religion data were obtained from the American Religion Data Archive (Bradley et al. 1992). Exploratory analyses did not show any strong effects. This is consistent with available opinion data. A 1993 survey (Gallup Organization 1993, section 6) found that "[r]eligious barriers to organ donation do not appear to be widespread." Such religious objections as there were came mainly from Black and Hispanic respondents, who were "much more likely to report that organ donation is against their religion (14 percent and 13 percent agree, respectively) than are white respondents (4 percent agree)."

Third, states have implemented several kinds of laws that may affect organ procurement rates. Soon after the passing of the National Organ Transplantation Act, states began to provide the organ donor cards on the back of drivers' licenses. In the late 1980s, "required request" laws were introduced in most states. This legislation requires hospitals to consult with the potential donor's next of kin should the patient be near death. These developments are generally agreed not to have increased donation rates (Norris 1990), and a number of studies have shown that about a quarter of the time, eligible families are not offered the option to donate (Gortmaker 1996). Several states have passed "routine notification" laws, which require that all deaths, actual or imminent, be referred to the local OPO. There is evidence that this has increased procurement rates in some areas (Nathan 1999; Shafer et al. 1998). Because their diffusion was so rapid, the effects of these laws are not assessed here.

Few studies have analyzed variation in OPO procurement rates. None is entirely satisfactory. Prottas (1989) noted the importance of the organization of procurement and suggested a number of different measures of OPO effectiveness. Evans, Orians, and Ascher (1992) tried to estimate the number of potential donors but did not analyze procurement data. Siminoff and Nelson (1999) studied the efficiency of OPOs but confined themselves to a particular UNOS region. A study by Ozcan, Begun, and McKinney (1999) focused on organizational measures of efficiency but did not control for any structural variables. The analysis presented here brings together measures of structural and organizational forces affecting organ procurement and tests their importance using a good measure of the procurement rate across the whole population of procurement organizations.

DATA AND METHODS

To make a sensible comparison between OPOs we must first estimate a standardized procurement rate. To do so for any OPO in a given year, we need to know the number of donors it actually procured and the number of cadavers that it could have procured—that is, the true number of potential donors. The former figure is known with certainty, as UNOS tracks all the organ donors in the country. The latter figure must be estimated.

Following a study by the General Accounting Office (1997), I have assumed that the best estimate of the potential donor pool is the in-hospital death rate adjusted for circumstance or cause of death. Because organs suitable for transplantation must in general be undamaged and undiseased and quickly obtained after death, many causes or circumstances of death rule out

the possibility of donation. This is not quite a perfect measure, because the classification system[5] does not always give enough information to say with certainty whether a particular patient was a donor candidate or not. Nevertheless, this adjusted death rate is the best available denominator for calculating the procurement rate.

The CDC-WONDER database (maintained by the Centers for Disease Control and Prevention) provided counts of all deaths by county for 1997. These data were filtered using the criteria reported in General Accounting Office (1997) to yield an estimate of "Donor Evaluable Deaths." (The rate calculated with this number is sometimes called the "Donor Extraction Rate," or DER.) The dependent variable in the analysis is therefore the absolute number of donors procured by an OPO in 1997 divided by the number of evaluable deaths and multiplied by a thousand. This county-level measure of evaluable deaths was summed for all counties administered by each OPO, thus aggregating observations for 3,142 counties to 61 OPOs.

This measure of the dependent variable controls for selection into the pool of potential donors. For example, motor vehicle accidents accounted for 26 percent of organ donors in 1997. The death rate from road accidents varied from 4 to 18 cases per 100,000 people in the same year. Thus, OPOs that operate in areas with high rates of road deaths can expect to have a higher procurement rate. A measure of road accident fatalities is not included in the present analysis, however, because its effect is already controlled for in the denominator of the dependent variable.

Measures of population density (per square kilometer), percentage of black population (in 1996), percentage of poor (in 1993), and percentage of population with a college degree (in 1996) are available by county from the Census Bureau. They were aggregated to the OPO level in the same way as the dependent variable. County-level population statistics were summed to the OPO level in order to calculate the rates. The original data are published in the Census Bureau's U.S. County Data for 1998.

Information about the resources of OPOs was compiled from Medicare reimbursement reports for 1997, which contain data on the spending, staff, and cost structures of the organization together with information on the costs of organ procurement. Procurement costs—including fees paid to hospitals, surgical teams, tissue-typing laboratories, and so on—are calculated by OPOs and, in the case of kidneys, are reimbursed by the federal government. These data were not used as a measure of the resource base, because these costs are an accounting measure that depends directly on the number of donors procured. To avoid a spurious correlation of this sort, spending was calculated from the Total Administrative Expenses worksheet of these reports and is expressed here in hundreds of dollars per capita. Administrative spending includes the salaries of the OPO staff and the cost of data processing and accounting, travel, employee professional education, public relations, and official vehicles, as well as other miscellaneous expenses. It is neither a balance-sheet measure of the direct cost of acquiring donors nor an index of the reimbursements associated with successful kidney procurement and therefore is not simply a function of the procurement rate.

Data on Referring Hospitals come from Appendix 5 of GAO report hrd-93-56 (U.S. General Accounting Office 1993). These figures are for 1991–92. Some OPOs changed their name or merged with others between then and 1997. Information from UNOS was used to reconcile the two lists. Because different hospitals treat different sorts of patients and not all patients are equally likely to become potential donors, I count the number of referrers per thousand in-hospital evaluable deaths.

Data on OPO procurement policies were collected by Wendler and Dickert (2001).[6] They conducted a telephone survey of OPOs. Although they did not observe organizational practices directly, the respondent was chosen by the executive director of each OPO as the person most familiar with the organization's consent practices.[7] The questionnaire presented

[5] The *International Classification of Diseases, 9th Revision— Clinical Modification,* or ICD-9CM code.

[6] I am grateful to the authors for kindly making this data available to me.

[7] Wendler and Dickert (2001) note, "A total of 26 (43 percent) respondents were the OPOs' executive directors, 19 (31 percent) were procurement or organ

cases where procurement might or might not be pursued by the OPO, varying the strength of both the potential donor's and the donor family's support for donation. Respondents used a five-point scale to say how likely their OPO would be to procure the organs. I combined these responses into a measure of the overall strength of the policy. The higher the score on this variable, the more likely the OPO is to express a willingness to procure across a wide range of adverse circumstances (that is, in the face of opposition from either the donor or the next of kin).

Table 1 provides descriptive statistics for each variable.

The data set includes all of the OPOs in the continental United States as of 1997. The relatively small number of observations means that regression estimates might be sensitive to outliers. A number of observations are missing for the spending and referral measures, which reduces the valid *N* in the analysis. The models that follow take these issues into account in two ways. First, I report the results of models using a robust MM-estimator. This method yields a more conservative estimate of the effects than regular OLS. These models were estimated using the rlm function in R (Venables and Ripley 2002, 161–63; R Core Development Team 2003). The results are substantively the same as an OLS regression.

Estimating the robust model gives valid *N* of 44 rather than 61, due to missing data. Given that the deleted cases are missing observations on only one or two variables and the number of cases is small, it is preferable to make use of all of the available data to estimate a model rather than delete 17 cases. I used multiple imputation to predict values for the missing data. The algorithm applied here uses additive regression and predictive mean matching to impute missing values. This process is repeated multiple times using bootstrap resampling. Bootstrapping the imputation process generates a large sample of "new" data sets with imputed values. Regression coefficients are then calculated by fitting the model to the multiply imputed data sets and averaging the results. Variance and covariance estimates are weighted to account for the fact that the model is estimated from partly imputed data. The multiple imputation and model estimation procedures are described in more detail in Harrell (2001, 47–50, 69–70) and implemented in his Hmisc library for R.

RESULTS

Regression results are shown in Table 2. Model 1 shows a robust regression of the procurement rate on the structural and demographic variables. Population density has a significant positive effect on the procurement rate. The percent of an OPO's catchment area that is black, poor, or college-educated has a negative effect on procurement; all three of these factors are significant at conventional levels. Together, these variables explain just over 30 percent of the observed variation in the procurement rate.

Model 2 shows the same variables as model 1, with the organizational measures added. The structural and demographic controls generally retain their sign and magnitude. Population density and racial composition significantly affect the procurement rate. A 10 percent increase in population density per square kilometer increases the procurement rate by just over 0.6 of a point. A percentage point increase in the number of African-Americans in an OPO area is associated with a statistically significant drop in the procurement rate of just over a quarter-point. The poverty rate is still negatively asso-

Table 1. Means and Standard Deviations of Variables

Variable	Mean	SD
Procurement rate	40.11	12.35
Population density (km^2)	186.19	571.49
Percent black	9.65	10.78
Percent poor	15.69	4.69
Percent college	15.23	4.10
OPO spending	29.29	19.50
Referring hospitals	38.03	19.85
OPO policy	34.43	6.11

Note: Procurement rate, population density, organ procurement organization (OPO) spending, and referring hospitals are standardized per million population or per thousand evaluable deaths, as appropriate.

recovery coordinators, 11 (18 percent) were directors of procurement, and 5 (8 percent) were chief executive officers. A total of 51 (84 percent) had been employed by their current OPO for 3 or more years, and 41 (67 percent) had been employed by their current OPO for more than 6 years" (p. 331).

Table 2. Models Predicting Donor Procurement Rates

	Model		
Variable	1	2	3
(Intercept)	52.907**	3.109	1.331
	(5.10)	(.19)	(.08)
Population density (log)	5.174**	6.574**	6.319**
	(3.14)	(4.27)	(4.39)
Percent black	–.325*	–.298*	–.333*
	(–2.24)	(–2.20)	(–2.57)
Percent poor	–.937*	–.616	–.582
	(–2.53)	(–1.65)	(–1.77)
Percent college	–1.134*	–.957*	–.840*
	(–2.51)	(–2.30)	(–2.12)
OPO spending (log)		9.359**	9.243**
		–3.04	–2.96
Referrers		.149*	.183**
		–2.31	–2.88
OPO policy		–.040	–.011
		(–.20)	(–.05)
Adjusted R^2	.336	.534	.443
Valid N	61	44	61

Notes: Models 1 and 2 employ a resistant MM-estimator. Model 3 employs multiple imputation. See text for discussion. T-values are in parentheses below coefficients.
* $p < .05$; ** $p < .01$ (two-tailed test)

ciated with procurement, but is no longer significant at $p < 0.05$.

The percentage of the population that is college educated retains its significantly negative effect. This finding is contrary to expectations. Survey studies report substantially stronger support for organ donation among more educated people, and education tends to predict charitable giving and other kinds of altruism. There is, however, no strong evidence that the behavior of more educated people follows directly from their attitude toward donation. Further, outcomes are measured here at the OPO level rather than the individual level, so we cannot be confident that individual preferences explain this effect. A mechanism consistent with the argument that the organizational basis of procurement is very important is that better-educated people are less likely to die in circumstances conducive to procurement (such as motorcycle accidents and gunshot or stab wounds). Consequently, areas with more-educated people might have relatively fewer prospective donors among all deaths. Recall, however, that regional variation in cause of death is already accounted for in the construction of the dependent variable, so the negative effect of education seems to remain to be fully explained.[8] One possibility is that the effect is the result of outlying observations. A sensitivity analysis suggested that the "percent college" measure was the variable most sensitive to the presence of a small number of cases in the data, but its effect was always negative.

The three organizational measures show interesting patterns. Taken together, they raise the R^2 of the model from 33 to 53 percent. OPO resources are positively and significantly related to the procurement rate. A 10 percent increase in spending raises the procurement rate by nearly 0.9 points. Organizational scope also has a strong effect on procurement. A 5-point increase in referrer density raises the procurement rate by about 0.75 points. These results strongly suggest the importance of the OPOs' logistical capability in raising the procurement rate.

In contrast, the measure of persistence—OPO policy—is not significant, and even the weak effect is not in the expected direction. Two interpretations may be suggested. First, it

[8] In an otherwise identical model with donors *per million population* as the dependent variable, the education effect is stronger and more significantly negative than those in Table 2.

may be that the measure used here is not picking up the underlying variations in organizational practice. The answers the OPOs gave when asked about policy may not accurately reflect the way they operate. But, second, since those designing the survey instrument behind this variable took considerable care to ensure accurate responses, the consent policies of OPOs may not in fact have a strong effect on the procurement rate.

Model 3 shows the results when all the available data are used and missing values are imputed. The pattern of results is broadly the same as that in model 2, with all of the variables retaining their magnitude and significance.

DISCUSSION

The organizational and institutional basis of variation in altruistic practices is a theoretically important but underexplored area. The production of altruistic action can be thought of as a resource extraction problem for organizations, a problem that they will solve more or less effectively. Thus, individuals' capacity for altruism and the social organization of procurement are not separate questions, but rather two aspects of the same process. As organizations create contexts for giving they generate altruistic action differentially across populations. Rather than simply drawing from sui generis donor populations, they help create them. Previous theory and research suggested that social context was important, but did not address just which organizational features mattered in effectively generating donation.

The decision to donate the organs of one's next of kin can rightly be seen as an individual choice made in terrible circumstances. But the opportunity to make that choice is created by a network of organizations whose job it is to find candidates for organ procurement, elicit an altruistic action from the next of kin, and get the organs to wherever the allocation system says they need to go. These organizations do their job more or less effectively, in more or less favorable circumstances. Investment in the logistics of procurement has a strong influence on the number of donors procured. My study shows that even essentially one-shot exchanges are, to a significant degree, organizational accomplishments. There is also some evidence that, for this kind of altruism, the role of individual characteristics (such as education) differs from longer-term patterns of giving, though this remains an open question given the data.

The social organization of altruism is of course a larger question than the particular case of organ procurement. It is a long-standing, though muted, theme in social theory. The sociological analysis of altruism is dominated by the idea that it is a scarce resource unevenly distributed across individuals. Yet this misses a distinctive aspect of the problem. Titmuss (1971) argued that "[t]he ways in which society organizes and structures its social institutions . . . can encourage or discourage the altruistic in man" (p. 225). Following his lead, Singer (1973) suggests that we can think of a quality like altruism as being a capacity or skill that becomes more available with regular use. Hirschman (1992) qualifies this idea, arguing that such qualities "exhibit a complex, composite behavior: they atrophy when not adequately practiced and appealed to . . . yet will once again make themselves scarce when preached on and relied on to excess" (p. 157). Each of these theorists highlights the way in which a basic capacity for altruistic action may be structured and developed by the organizational and institutional environment. Yet there has been little investigation of the particular circumstances and conditions under which this happens. One-shot altruistic practices are of particular interest in part because they seem to lack a significant institutional dimension and to depend largely on the individuals involved. But I have argued that the one-shot case, in particular, reveals the logistical efforts required to constitute populations of donors. This adds a novel dimension to our knowledge of the institutional underpinnings of individual identities and opportunities for action.

Future research could further investigate aspects of the organ procurement system or apply the approach outlined here to other forms of altruism. In the case of organ donation, we know little about the dynamics of procurement over time or the way different parts of the organizational system interact with one another and with individual donors. The typology I present here may help clarify the different contexts in which altruistic actions take place and may raise comparative questions about why different actions become institutionalized in different ways. We can ask why different forms of altru-

ism—such as blood donation, charitable donations of money in various forms, voluntary work, and so on—come to be institutionalized in different ways, or why the same practice is organized differently in different places. Although the emphasis here has been on the organizational dimension, it would be a mistake to see a stark opposition between individual actions and organizational practices. Without the reasons that make it meaningful for an individual to donate, providing the necessary opportunities to do so would be futile. Yet it is also an error to focus entirely on the individual, particularly if this means attending only to whether a particular action is truly altruistic. Framing the problem in this way draws attention away from the organizational mechanisms through which different kinds of donor populations are created.

The dominance of the concept of self-interest, both as a starting point for social theory and an assumption about interaction in everyday life (Miller and Ratner 1996), tends to make students of altruism look like partisan defenders of it. It is clear that we should not be content simply to show that altruism happens. A middle-range approach to explaining the organizational sources of variation in altruism complements our growing understanding of the socially situated character of self-interested action (Fligstein 2001; Granovetter 1985). To draw an analogy, few would agree that the discovery of a general tendency in people to "truck, barter and exchange one thing for another" (Smith 2000 [1776]: 14) is the end point of research on self-interest. Rather, it is the beginning of study into the institutions and organizational systems that surround and sustain this basic disposition.

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