SYMPOSIUM

The Critical Mass in Collective Action: A Micro-Social Theory
by Gerald Marwell and Pamela Oliver
Cambridge: Cambridge University Press, 1993

REVIEW ESSAY

Providing for the Common Good

KAREN S. COOK AND DAVID KARP
University of Washington

It is now axiomatic in social theory, if not in real life, that the provision of public goods in any social system usually entails a problem of collective action. Whether it is the provision of police protection, public television, a city water supply or a shared bridge across the water, collective efforts or the organized activities of many are typically required. Most of the time public goods of this sort are provided through some system of taxation which generates the funding for the organizations and institutions that have been established to produce these common goods. But this is only one of many solutions that have been developed over time to deal with the problems entailed in providing collective goods based on individual contributions. Historically, communities dealt successfully (and sometimes unsuccessfully) with these problems long before they captured the attention of social theorists.

Garrett Hardin's (1968) well known "tragedy of the commons" and Mancur Olson's (1965) path-breaking treatise on the "logic of collective action" placed the set of problems, which came to be referred to as social dilemmas, firmly on the agenda of social science research well over two decades ago. The puzzle posed by Olson has been the subject of countless critiques (e.g., Hardin, 1982) and experiments (see reviews by Dawes 1980, Messick and Brewer 1983, and Yamagishi 1994) investigating the various "solutions" to the problem of free-riding. Free-riders are those who benefit from the provision of a public good without bearing any of the costs. In theory, rational egoists will be free-riders in the situation in which they can benefit with immunity. Free-riding, however, is only one of the many problems identified in the literature which followed from Olson's pioneering work. The more generic problem identified by Olson in 1965 was a major challenge to many strands of existing social and political theory which treated as non-problematic the assumption that individuals with a common goal will cooperate and coordinate their actions to pursue that goal.

According to Marwell and Oliver (1993:47) in their book, *The Critical Mass in Collective Action: A Micro-Social Theory*, the dilemma of collective action (i.e. the social dilemma) in the provision of public goods "adheres to the high cost of providing them, relative to individual resources and interests, not to the number who share in them." They turned Olson's logic of collective action on its head arguing against the notion popularized subsequent to the publication of Olson's book that group size is negatively related to the probability of providing for the common good. That is, it was suspected by Olson that the larger the group, the farther it would fall short of providing an optimal amount of the collective good (sans selective incentives).This proportion became known in the literature as the "group size effect" and it has been studied extensively (e.g. Hardin, 1982; Marwell and Ames, 1979; Stroebe and Frey, 1982; Isaac and Walker, 1988; Yamagishi, 1993). In fact Marwell and Oliver propose that under certain conditions the larger the group, the more likely a critical mass will emerge which will provide for the common good. This argument formed the crux of a body of work that led Marwell and Oliver to publish a series of articles (e.g., Oliver, Marwell, and Teixeira, 1985; Oliver and Marwell, 1988; Marwell, Oliver, and Prahl, 1988) and subsequently lace them together in more complete form in their book on the role of the critical mass in collective action.

Interestingly, *The Critical Mass in Collective Action*, published in 1993, is not intended as an empirical treatment of the problem of collective action despite the existence of a fairly large body of evidence obtained both in experimental settings and in field studies of social movements. This is the book's primary

weakness; it could have more fully engaged the relevant empirical literatures than it does. To be fair, however, the authors had an entirely different purpose in mind. The book is straightforwardly a theoretical and analytical enterprise. The goal was first and foremost to explore the deductive consequences of various theoretical assumptions about variables (their distributions and interrelationships) relevant to theorizing about problems of collective action. The selection of variables and the assumptions underlying the formal models are often derived from the authors' experiences as activists and from cases they have studied of successful and failed social movements. In fact, this is the primary form of contact with empirical data in the pages of the book. The tables and figures presented in the text are results derived from simulations that explore the specific paramaterizations of the formal models developed in each chapter to investigate the effects of particular variables on the outcome of collective action (usually presumed to be the public goods that are provided under different conditions). The variables given primacy in the initial chapters include group size, interdependence of the potential participants and heterogeneity (or homogeneity) of the group member's interest levels and resource endowments. Subsequent chapters deal with the importance of production functions and various aspects of the social networks of potential participants including density, centralization, clique structure, reach and selectivity. The book bridges the gap between the more sterile laboratory investigations of social dilemmas and the complex socio-political reality of large-scale social movements (see also Oliver and Marwell, 1984). It falls squarely in between.

What is distinctive about the approach adopted by Marwell and Oliver is that they assume from the beginning that most of the time a "critical mass" is required for the provision of public goods. Figuring out how to mobilize this critical mass, rather than the masses, is the crux of their theoretical enterprise. While there is much to comment on with respect to the specific arguments presented by Marwell and Oliver we will chart a slightly different course in this review essay. Our main focus is the relationship of this book to current strains of sociological inquiry, not its internal logic, though we will comment first on a few of the specific theoretical contributions of the book.

On Production Functions

The most significant analytical contribution is the clear demonstration of the importance of the production function assumed to be operating in the provision of the public good. A public good, as Oliver and Marwell (1984) define it, is one that must be provided to all group members if it is provided to any (i.e. it is characterized by "non-excludability"). Examples include clean air, a smoke-free work environment and public television in some countries. Another defining feature is "jointness of supply," the term used to refer to the fact that the utility one individual obtains from the collective good is not reduced by the consumption (or use) of another (e.g. clean air). As Uedhn points out (1993:240), Olson emphasizes the first dimension, non-excludability, typically the root cause of free-riding (and the difficulty of obtaining contributions to the public good) and focuses less attention on the latter dimension, which is more often associated with an increase in the probability of the provision of a public good. This omission is one of the reasons (see also Hardin 1982 on this topic) the group size argument has been found to be faulty at the formal level. Jointness, it is argued (Marwell and Oliver 1993; Uedhn 1993), makes the benefits of contributing for individuals basically independent of group size. Essentially, as Uedhn (1993:242) in a recent review essay on Olson's work, concludes, with respect to group size, "there is not one simple relation between group size and collective action" since there are various types of public goods and different problems in providing them.

Marwell and Oliver (1993) make a very similar argument regarding the defective nature of the simplistic version of the group size argument in their chapter on the paradox of group size, but they go into much greater depth in their analysis of the relationship between production functions and the provision of public goods. The real dilemma, much of the time, is that individuals cannot make "enough of a difference" to compensate them for the cost of contributing (1993:55), thus, they argue, we are more likely to see small group solutions. "What matters for successful mobilization is that there be enough people who are willing to participate and who can

also be reached through social influence networks" (1993:55). In other words, what matters most is the formation of a "critical mass."

A simplistic linear assumption was embedded in the early literature on the provision of public goods regarding the relationship between effort and effect. Marwell and Oliver examine more fully the "production relation" between the costs that individuals bear and the benefits they obtain from the collective good. The relationship can be linear (as initially assumed implicitly, if not explicitly), a step function (see also Hardin 1982), a general third order curve (S shape), an accelerating curve or a decelerating curve. This analysis allows them to address such interesting cases as the provision of "lumpy" goods like bridges that are best represented by a step function (either you have one or you don't, but there is nothing in between) and situations in which there are either very high start-up costs (decelerating production function) or very low start-up costs (accelerating production function). With high start-up costs subsequent contributors become less willing to contribute (e.g. the picnic that takes a small "critical" mass to produce for many to enjoy). With low start-up costs everyone waits for the first group of individuals to get the process going and when that happens then many join in, but their efforts quickly become redundant (e.g. creating a community center). Marwell and Oliver's analysis accounts for interdependent decision-making, the role of different levels of interest among the potential contributors, and inequality in the distribution of resources, taking a big step toward providing a theory of collective action that fits real cases. Of course, they retain other simplifying assumptions, but some simplification is necessary to render the problems tractable. What the economist may find a reasonable simplifying assumption goes against the grain in sociology and political science. An example is the assumption of independence of decisions. Sociologists and political scientists are far more comfortable with the acknowledgment of interdependent decision-making and the explicit recognition of social influence processes as well as contingent or conditional cooperation (e.g. I will, if she will) despite the analytic complexity added. The analysis of production functions gives us a window into the many different forms that collective action problems take and the conditions under which various solutions become more or less feasible. Another important contribution of the book is its explicit consideration of the social worlds of the potential participants in various collective actions.

On Social Networks

Assuming and then demonstrating that social structure matters has been the *sine qua non* for good sociology from the beginning. Marwell and Oliver take on this specific task in the context of social dilemmas. To link their theoretical apparatus more closely to real world problems of collective action they shed the more restrictive assumptions of limited interaction and communication for models that try to specify how social ties and social influence processes work to facilitate or hinder the success of collective efforts to provide for the common good. As Uedhn (1993:243) puts it, "The insight that in real life people meet again, and often remember what happened last, has proved to be of paramount importance for an understanding of the logic of collective action." Marwell and Oliver also take on the analytical task of demonstrating specifically how the social networks of potential participants matter. Here the book is somewhat thin on contact with the empirical work on social movements and the extensive literature on social networks (though key studies in both fields are mentioned, like the work of McAdam, 1988 and Granovetter, 1973). However, they do present an intriguing set of simulations exploring in some depth the effects of aspects of individuals' social networks on the prospects for coordinated collective action. Recall that in the "standard" social dilemma setting people are assumed to make their decisions independently without benefit of the knowledge of others' decisions or even the possibility of communication (but see Dawes, McTavish and Shaklee, 1977, on communication effects). Marwell and Oliver explicitly consider the connections between actors and how these connections matter in collective action situations.

At the core of the model of "simultaneous coordinated action" that Marwell and Oliver develop is the assumption that "there is a single organizer who contacts all possible actors and absorbs all the costs of organizing" (p. 101). While this assumption may work for some types of public goods like organizing a group to fight a school closure, it literally assumes away Olson's version of the problem of collective action (and the variant of social dilemmas studied most frequently in the laboratory). For some types of collective action the costs increase as the size of the critical mass required increases (e.g. telephone and postage expenses) and may quickly exceed the resources of the organizer (or committed subgroup). Since the authors believe that organizer-centered mobilizations are an extremely common form of collective action, they go on to explore precisely how social networks facilitate or hinder the mobilization of collective efforts. Several interesting results emerge from these simulations, but few are counter-intuitive. For example, the best organizer has the largest network (i.e. can reach more people), and lower organizing costs and network centralization increase the success rate of collective actions. The network centralization effect is, in part, due to a specific feature of the simulation: namely, that the modal personal network size is too small to achieve success. Network centralization refers to variance in the size of the networks of individuals in the group. Success depends on the existence of potential organizers with large-enough networks. As the variance in network sizes increases (i.e. heterogeneity increases), the size of the typical personal network decreases and a few actors become clear "targets" as organizers simply because of the size of their personal networks. This is the primary reason why certain people are often asked to spearhead particular fund-raising drives. Identifying the most obvious candidates as possible organizers becomes easier when there is a concentration of ties around one or a very few individuals. Though this result is sensitive to the assumptions built into the simulations and the specific parameter values defined by the authors, this "finding" might have emerged just as quickly from an empirical study of organizers. The problem with simulations is that they can be used to derive a variety of theoretical results precisely because they are so sensitive to the assumptions built into the model. As the authors readily concede, simulation results are not a substitute for empirical work.

The network analyses also lead them through further simulations to the "discovery" of the effect of what they call "selectivity". Selectivity means that organizers must select carefully from among their network contacts those who would facilitate success (i.e. those with the most resources assuming heterogeneity in the distribution of resources among group members). As Marwell and Oliver phrase it, "knowing more people turns out to be important for being able to reach the few right people" (p. 122). They define this result as the most important theoretical insight to emerge from their simulations. In pursuing this result they further refine the notion demonstrating through simulation the effectiveness of mobilization efforts that can be "targeted" to those who are more likely to contribute or who can contribute the most. (Of course, this implies that more information is provided as a result of personal network ties.) Selection and targeting "always help," they conclude. Fund-raisers for non-profit groups or organizations would not find this insight particularly new, and it is surprising that social movement theorists would. But Marwell and Oliver ask more subtle questions that do provide useful strategic knowledge. For example, given resource variability in networks and various assumptions about costs, they ask when is it worth contacting new people (i.e. adding to the network) rather than focusing recruitment efforts on those already in the network for whom information exists. In addition, in one of the final chapters they explore various strategies for recruitment assuming trade-offs between "quantity" and "quality" of the recruits. This exercise is quite informative. The strategies they examine are techniques for communicating a campaign to a subset of an interest group. Here the work touches upon interest group politics, but does not go into that literature. Threshold effects (that is, the significance of having enough contributors) and the relatively greater effectiveness of strategies based on maximizing resource levels (rather than interest in the outcome) are discussed and the practical implications for movement organizers are reviewed. This discussion provides some interesting insights for those who would be successful mobilizers. Marwell and Oliver conclude the book by suggesting that hypotheses derived from their simulation results might best be tested by studying historically major collective actions and social movements. Hopefully, this book will stimulate empirical tests of the many "results" derived from their simulations since the ultimate test

of a good theory is its empirical utility. In this sense it is appropriate that the book ends with a chapter entitled "Unfinished Business."

The Larger Theoretical Context

While it is currently quite popular in the social sciences to revisit the relationship between the individual and the collectivity, collective action theory is really only a new label for a very old problem in social theory. Consider, for example, Rousseau's (1762:63) observation that an individual's ". . . private interest may influence him, in a manner diametrically opposite to the common interest of the society . . . He may be desirous of enjoying all the privileges of a citizen without fulfilling his engagement as a subject; an injustice, that, in its progress, must necessarily be the ruin of the body politic." The essential question that theorists ask is why would individuals contribute to a collective good when the opportunity for free-riding presents itself? While individuals hope others will bear the costs, their failure to do so has direct negative consequences for the individual. And although each would rather have others provide the good, each would also rather contribute than have no good at all. This is the crux of the dilemma.

The theoretical issues surrounding such dilemmas have captured the attention of a wide variety of scholars in the social sciences from economists to anthropologists. Related topics include game theory, social movements, common-property resource management, public choice, sociobiology, social, political, and moral theory. The critical mass theory of Marwell and Oliver is a direct descendent of both collective action theory (e.g., Samuelson 1954, Olson 1965; Hardin 1982) and social movements theory, particularly resource mobilization theory (Marwell and Oliver 1984; Klandermans 1984; Oberschall 1973; McCarthy and Zald 1973). Collective action theorists typically examine collective goods that may be provided by some fraction of the group that benefits from their provision; hence the focus upon the critical mass. In addition, the focus tends to be on goods with jointness of supply (or some approximation of it). This focus primarily derives from particular empirical cases upon which the theorists' models are built. But limiting the focus to situations meeting these conditions tends to foreclose the interests of others who are similarly concerned with social dilemmas. Because the generic problem is basically the same, but the conditions different, it is important to locate Marwell and Oliver's work within this broader theoretical context.

Garrett Hardin's (1968) tragedy of the commons is actually quite different from Marwell and Oliver's collective action problem. In his tragedy, based on a nineteenth century essay by William Forester Lloyd (Hardin and Baden 1977), a common grazing land is slowly overgrazed beyond its carrying capacity. It is the actions of many that bring ruin to the commonly-held property; limiting cattle by a minority of herdsmen would do nothing to divert the tragic course. Tragedies of the commons are typically characterized by the high proportion of cooperators needed to preserve the collective good. Such is the case with many environmental problems. Moreover, the concept of jointness of supply is replaced by the concept of "subtractability" (Ostrom 1990), in which one individual's consumption of the good (or failure to contribute to the good) has a measurable effect on others' capacity to benefit from the good. Perhaps subtractability increases the likelihood of resolving the dilemma, while the necessity of obtaining high levels of cooperation decreases this likelihood. Theorists who analyze common-property resources frequently take an institutional perspective, concentrating on the management systems that are developed to maintain the commons. Typically, this research is ethnographic, such as Acheson's (1975) classic study of the normative institutions that emerged to protect lobster fiefs in Maine.

Social psychologists have primarily examined the dynamics of collective action experimentally under the title social dilemmas. Although they use small groups, the separation of subjects and the anonymity of their choices reduces the effects of small group dynamics, and situates them within the decision context of large groups. Social psychologists follow the principles of game theory, and primarily structure their experiments as Prisoner's Dilemmas, although other games are sometimes analyzed. Hardin (1971) demonstrated that the collective action problem is also a Prisoner's Dilemma. Social psychologists have split their time between testing the effects of structural changes on levels of cooperation and the effects of

individual differences. Research on social dilemmas has explored the myriad of reasons for cooperation and defection and how cooperation can be increased.

Cooperative acts may be motivated by factors that fall outside the framework of rational action. Various cognitive biases may cause individuals to either falsely presume a degree of efficacy that does not truly exist or to choose a course of action that they perceive will yield higher individual benefits than it actually does. The causal consequences of various decision frames (see Tversky and Kahneman 1990) are still poorly understood. We do not understand why "take-some" and "give-some" games, which are logically equivalent, are not also psychologically equivalent (Brewer and Kramer 1986; Fleishman 1988). We do not fully understand why assigning a member to an arbitrary and transient group will increase cooperation (Caporael et al. 1989; Kramer and Brewer 1984). These effects may be partially explained by the tendency for individuals to take the "path of least resistance," using cognitive short-cuts that help them negotiate a complex social environment fraught with uncertainty. Or these effects may be explained in part as conditioned responses to situational cues. Furthermore, "extra-rational" behavior in the laboratory may have rational correlates in the real world where group membership, for example, is less random, longer-lived and often more salient.

Rational choice theorists have been quite successful in pointing out the circumstances under which it is rational to cooperate. These circumstances always involve some fundamental, objective change in the structure of the dilemma transforming cooperation into the dominant strategy. This transformation occurs most obviously through changes in the incentive structure by making cooperation more attractive or defection (i.e. noncooperation) less attractive. The most obvious example is the introduction of sanctions (Heckathorn 1992; Yamagishi 1986; Oliver 1980). The interdependence structure may also be altered increasing perceived individual efficacy or the degree of dependence upon group members. This may be achieved, for example, through privatization (Cass and Edney 1978), introducing intergroup competition (Bornstein et al. 1990), increasing exit costs (Yamagishi 1988), or creating opportunities for strategic action (Axelrod 1984). It is certainly possible and desirable under many circumstances to make cooperation the "rational choice."

Even when presented with the same objective situation, however, individuals differ in their choices, and these differences cannot be entirely explained along a continuum of degrees of rationality. Some subjects exhibit greater trust in others (Yamagishi 1986; Kuhlman and Wimberly 1976). Some players show a preference for gains when others simply hope to avoid losses (Bruins et al. 1989). Players exhibit different social orientations, some concerned only about themselves, some concerned about others (i.e. prosocial), and some highly competitive in orientation or even antisocial (Messick and McClintock 1968; Liebrand 1986). Since individuals share in the collective benefits achieved through cooperation, self-interest often combines with collective interest to produce a cooperative social motivation. As social psychologists have demonstrated, individuals' differing orientations toward social interaction dramatically affect collective outcomes.

Elsewhere on the landscape of current social theory, moral cooperation is being examined by sociologists who are critical of a highly individualistic society (e.g. Bellah et al 1985, 1991; Etzioni 1993; Wolfe 1989). The emphasis on moral solutions clearly distinguishes these theorists from rational choice theorists. Where rational choice theorists attempt to find solutions for pure egoists, these theorists, often called communitarians (Lasch 1988), find moral obligation a viable alternative. Moral cooperation is not necessarily altruistic. That is, it is not necessarily prosocial without consideration of one's own interests. Moral cooperation takes both individual and others' interests into account. Choosing cooperation is the "collectively-interested" choice because it is in the interest of both self and others.

Rational choice theory discloses instances of cooperation in social dilemmas that are not morally motivated. The communitarians attempt to disclose those instances that are. The communitarians have largely been normative and prescriptive. They have relied heavily upon cultural critique and social philosophy. While there have been extensive attempts to quantify moral choice and measure values in general (Kohlberg, 1968; Blasi, 1980; Schwartz, 1991), relatively little empirical

research has been conducted exploring moral cooperation in experimental social dilemmas. We may wonder if the range of solutions considered has been unnecessarily limited by the predominant underlying assumption of rational action.

Marwell and Oliver (1993:5) argue that the problem of collective action is "everywhere in social life." Social dilemmas are a paradox for game theorists, a central theoretical problem for a wide variety of social scientists, and an intractable problem for any individual with a collective vision, who fears receiving the "sucker's payoff." Social dilemmas would be resolved easily if we were not equally concerned with both providing collective goods and ensuring individual freedom. Whether it is giving blood, conserving water in a drought or serving on a jury, preserving individual freedom often conflicts with the goal of achieving a common good. When freedom is also a valued collective good, we are left with a trying conflict of goals. Marwell and Oliver's book is an important theoretical contribution to the understanding of the aggregate consequences which result from the interdependent decisions of those with heterogeneous resources and interests in collective action. The authors offer a sophisticated method of theoretical inquiry and many propositions worthy of empirical investigation.

The main contribution of this book to the development of social theory is that it bridges the gap between the "thin" rationality and sterile logic of economic approaches at one extreme and the theoretically underdeveloped, sometimes "messy" and overly descriptive work of sociologists on social movements at the other extreme. But more significant in the long run than the specific substantive contributions of the book may be its method of theoretical inquiry. Although simulations are rarely used in the social sciences, they are much more common in the other sciences (especially in applied fields) precisely for the reason that Marwell and Oliver use this method: to explore the effect of a range of values of key variables on a process or set of outcomes of interest. As a theory building tool, despite its obvious limitations, simulation does provide "evidence" that under some circumstances would be impossible to obtain (e.g. results for groups with strictly homogeneous interest levels). The detailed and careful exploration of the relationship among variables in a theory is enhanced by this method. Furthermore, building a baseline model, however unrealistic and overly simplified, does facilitate the interpretation of the effects generated by more complex models. These results would be uninterpretable in many cases without comparison to the baseline model. As we have argued, however, the proof of the usefulness of simulation as a strategy for theory building lies in the nature of the subsequent theoretical and empirical work it inspires. On this score, the jury will be out on the Marwell and Oliver book for some time.

REFERENCES

Acheson, J.M. 1975. "The Lobster Fiefs: Economic and Ecological Effects of Territoriality in the Maine Lobster Industry." *Human Ecology* 3: 183–207.

Bellah, Robert N., Richard Madsen, William M. Sullivan, Ann Swidler, and Steven M. Tipton. 1985. *Habits of the Heart: Individualism and Commitment in American Life*. Berkeley, CA: University of California Press.

Bellah, Robert N., Richard Madsen, William M. Sullivan, Ann Swidler, and Steven M. Tipton. 1991. *The Good Society*. Berkeley, CA: University of California Press.

Blasi, Augusto. 1980. "Bridging Moral Cognition and Moral Action: A Critical Review of the Literature." *Psychological Bulletin* 88: 1–45.

Brewer, Marilynn B. and Roderick M. Kramer. 1986. "Choice Behavior in Social Dilemmas: Effects of Social Identity, Group Size, and Decision Framing." *Journal of Personality and Social Psychology* 50:543–549.

Bruins, J. Jan, Wim B.G. Liebrand, and Henke Wilke A.M. 1989. "About the Saliency of Fear and Greed in Social Dilemmas." *European Journal of Social Psychology* 19: 155–161.

Caporael, Linnda, Robyn M. Dawes, John M. Orbell, and Alphons J.C. van de Kragt. 1989. "Selfishness Examined: Cooperation in the Absence of Egoistic Incentives." *Behavioral and Brain Sciences* 12: 683–739.

Dawes, Robyn M. 1980. "Social Dilemmas." *Annual Review of Psychology* 31: 169–193.

Dawes, Robyn M., Jeanne McTavish, and Harriet Shaklee. 1977. "Behavior, Communication, and Assumptions About Other People's Behavior in a Commons Dilemma Situation." *Journal of Personality and Social Psychology* 35:1–11.

Etzioni, Amitai. 1993. *The Spirit of Community*. New York: Crown.

Fleishman, John A. 1988. "The Effects of Decision Framing and Others' Behavior on Cooperation in a Social Dilemma." *Journal of Conflict Resolution* 32: 162–180.

Granovetter, Mark. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78: 1360–1380.

Hardin, Garrett. 1968. "The Tragedy of the Commons." *Science* 162: 1243–1248.

Hardin, Garrett and John Baden, eds. 1977. *Managing the Commons*. San Francisco: Freeman.

Hardin, Russell. 1971. "Collective Action as an Agreeable N-Prisoners' Dilemma.' *Behavior Science* 16: 472–481.

Hardin, Russell. 1982. *Collective Action*. Baltimore: Johns Hopkins University Press.

Heckathorn, Douglas D. 1992. "Collective Sanctions and Group Heterogeneity: Cohesion and Polarization in Normative Systems." *Advances in Group Processes* 9:41–63.

Isaac, R. Mark and James M. Walker. 1988. "Group Size Effects in Public Goods Provision: The Voluntary Contributions Mechanism." *Quarterly Journal of Economics*: 179–199.

Klandermans, Bert. 1984. "Mobilization and Participation: Social-Psychological Expansions of Resource Mobilization Theory." *American Sociological Review* 49: 583–600.

Kohlberg, Lawrence. 1968. "Moral Development." *International Encyclopedia of the Social Sciences*, edited by D.L. Sills. New York: Macmillan.

Kramer, Roderick M. and Marilynn B. Brewer. 1984. "Effects of Group Identity on Resource Use in a Simulated Commons Dilemma." *Journal of Personality and Social Psychology* 46: 1044–1057.

Kuhlman, D. Michael and David L. Wimberley. 1976. "Expectations of Choice Behavior Held by Cooperators, Competitors, and Individualists Across Four Classes of Experimental Games." *Journal of Personality and Social Psychology* 34: 69–81.

Liebrand, Wim B.G. 1986. "The Ubiquity of Social Values in Social Dilemmas." Pp. 113–134 in *Experimental Social Dilemmas*, edited by H.A.M. Wilke, D.M. Messick, and C.G. Rutte. Frankfurt; Verlag Peter Lang.

Marwell, Gerald and Ruth E. Ames. 1979. "Experiments on the Provision of Public Goods by Groups I. Resources, Interest, Group Size, and the Free-Rider Problem." *American Journal of Sociology* 84: 1335–1361.

Marwell, Gerald and Pamela Oliver. 1984. "Collective Action Theory and Social Movements Research." *Research in Social Movements, Conflict and Change* 7: 1–27.

Marwell, Gerald and Pamela Oliver. 1993. *The Critical Mass in Collective Action: A Micro-Social Theory*. Cambridge: Cambridge University Press.

Marwell, Gerald, Pamela Oliver, and Ralph Prahl. 1988. "Social Networks and Collective Action: A Theory of Critical Mass III." *American Journal of Sociology* 3:502–534.

McAdam, Doug. 1988. *Freedom Summer*. New York: Oxford.

McCarthy, John and Meyer Zald. 1973. *The Trend of Social Movements in America*. Morristown, NJ: General Learning Press.

Messick, David M. and Marilynn B. Brewer. 1983. "Solving Social Dilemmas: A Review." *Review of Personality and Social Psychology* 4: 11–44.

Messick, David M. and Charles G. McClintock. 1968. "Motivational Bases of Choice in Experimental Games." *Journal of Experimental Social Psychology* 4: 1–25.

Oberschall, Anthony. 1973. *Social Conflict and Social Movements*. Englewood Cliffs, NJ: Prentice Hall.

Oliver, Pamela and Gerald Marwell. 1988. "The Paradox of Group Size in Collective Action: A Theory of the Critical Mass II." *American Sociological Review* 53: 1–8.

Oliver, Pamela, Gerald Marwell, and Ruy Teixeira. 1985. "A Theory of Critical Mass I. Interdependence, Group Heterogeneity, and the Production of Collective Action." *American Journal of Sociology* 94: 502–534.

Olson, Mancur. 1965. *The Logic of Collective Action*. Cambridge: Harvard University Press.

Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

Rousseau, J. (1762) 1968. *The Social Contract* (Cranston, M., Trans.). New York: Penguin.

Samuelson, Paul A. 1954. "The Pure Theory of Public Expenditure." *Review of Economics and Statistics* 36: 387–389.

Schwartz, Shalom H. 1992. "Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 Countries." *Advances in Experimental Social Psychology* 25: 1–65.

Stroebe, Wolfgang and Bruno S. Frey. 1982. "Self-Interest and Collective Action: The Economics and Psychology of Public Goods." *British Journal of Social Psychology* 21: 121–137.

Udehn, Lars. 1993. "Twenty-Five Years with The Logic of Collective Action." *Acta Sociologica* 36: 239–261.

Wolfe, Alan. 1989. *Whose Keeper? Social Science and Moral Obligation*. Berkeley, CA: University of California Press.

Yamagishi, Toshio. 1986b. "The Provision of a Sanctioning System as a Public Good." *Journal of Personality and Social Psychology* 51: 110–116.

Yamagishi, Toshio. 1993. "Group Size and the Provision of a Sanctioning System in a Social Dilemma." Pp. 267–287 in *Social Dilemmas: Theoretical Issues and Research Findings*, edited by W.B.G. Liebrand, D.M. Messick, and H.A.M. Wilke. New York: Pergamon.

Yamagishi, Toshio. 1994. "Social Dilemmas." Pp. 311–334 in *Sociological Perspectives on Social Psychology*, edited by K.S. Cook, G.A. Fine, and J. House. Boston: Allyn and Bacon.

Karen S. Cook is Professor of Sociology and Director of the Center for Studies in Social Psychology at the University of Washington. She is currently engaged in research on social exchange networks, trust and commitment in interpersonal relations, and physician referral networks. Together with Gary Fine and James House she is co-editor of the forthcoming volume, Social Psychology: Sociological Perspectives (Allyn & Bacon).

David Karp is a PhD candidate at the University of Washington in the Department of Sociology. His research interests include social dilemmas, collective action, and environmental concerns. He has recently published an article in Human Relations.