PROBABILISTIC VALUES:

FAIRNESS, GROUP IDENTITY & COLLECTIVE ACTION

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for presentation at:
The Social Dilemmas Conference
Brown University, May 15-16, 2015

ABSTRACT: Maintaining our theories of non-market decision making on an outmoded foundation of assumed non-probabilistic, fixed preference, self-interest choice is dysfunctional and will end in the theories' atrophication. Policy relevant conjectures should be developed on a set of axioms with greater verisimilitude.

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Back in the earliest years of the 20th century, the world was Newtonian. The natural world, and the things in it, were assumed to be organized mechanically. Famously, two revolutions occurred to upset this mechanistic perspective. The first was relativity - clarifying that our very measurements are determined by the inertial system that contain our observers. The second was quantum mechanics - asserting the fundamental role of probability in our understanding of reality.

Those also were the years of consolidation of modern micro-economics and rational choice theories. As the century wore on, advances in our understanding of the brain wove these two revolutions into the analysis of decision making. Unfortunately, neither of the lessons of these revolutions have been properly absorbed into mainstream economic theory and most of its applications to non-market economics such as social dilemmas. Theories that were developed about non market subjects such as social dilemmas and social choices are deeply rooted in the soil of the old school of non-relativized, non probabilistic, rational choice theory. As such they are particularly resistant to innovations in the foundation. Unless that changes, one should expect that those theories will become increasingly irrelevant to our understanding of non-market decision problems.

Probably because of our roots in market economics much of rational choice theory has been built on the foundations of self-interest narrowly understood. Within the walls of market institutions such an assumption would seem to make considerable sense. After all, when we go to purchase beets for supper we may have many concerns, but the presentation, the quality, the freshness, the price of the beets, enter quite saliently and immediately in our purchase decision. After all, what we buy is what we eat.

How different is the individual decision in a social dilemma! What we support, ask for, select, or vote for, is often quite unrelated to our final servings. When so tenuous a relation exists between what we buy and what we eat, what we might call weak forces such as 'social concerns,' and 'other-regarding preferences' can be expected to leak in and even overwhelm our rather discounted self-interested point of view. Such effects can create quite severe shifts in our decisional outcomes.

Of course, these problems have not gone unnoticed. Psychologists have developed whole schools of reformulations to reconsider a theory of rational choice that is both probabilistic and in which individual values are relativized to context (consider the decision literature on framing by Kahneman and Tversky and the enormous scholarship it has spawned).[1]

I have long advocated the reformulation of individual choice theories along the mentioned lines. This society is in part founded to deal with these problems, and so, this paper is perhaps 'preaching to the choir.' The many advances that have been made in our understanding of the brain should

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[1]. The Bayesian revolution in decision theory of course is important with regard to introducing probabilistic modeling in decision theory. But it doesn't quite deal with the probabilistic issue as I am thinking about it. The Bayesian revolution presumes a fixed set of preferences and deals with the modeling of discounting in decision making. Although clearly a fruitful move, I am focusing on the possibility that the values themselves are all held in an essentially probabilistic fashion.

leave us with less confidence in non-probabilistic choice models.[2] Not only has choice been shown to be probabilistic, and framing to be a component of valuation, but even at the heart of our own empirical field, the explanation of experimental data for repeated n-person prisoner dilemma games requires such a reformulation.[3] So for the sake of verisimilitude, or realism, the foundations must be reconsidered.

In this paper I enumerate some of the substantive alterations useful for the development and application of rational choice theory to social dilemmas and some questions of social choice. I then briefly discuss some implications of the suggested changes for social engineering.

RESEARCH CONTEXT

Specifically, it is useful to begin our analysis of collective action with Olson's model. About a half a century ago Mancur Olson published his theory of collective action. Not long thereafter, Hardin (1971) proposed that the analysis be reformulated as an n-person prisoner dilemma game. Both Hardin and Olson presumed that such a model explained why collective action problems were so difficult to solve. Indeed, in the rough, theirs appeared to be one of the most successful applications of economic tools to non-market behavior. Their analyses and the literature it spawned included myriad experiments of repeated n-person prisoner dilemma games (contact TK Ahn – tahn3118@gmail.com – for archival information on data from these experiments).

Data from the N-person Prisoner Dilemma Experiments

These and most other related lines of inquiry utilized the same traditional presumptions of rational choice theory. Choice was presumed to be based on immutable values, tied to a simple self-interest tableau, in a non-probabilistic fashion. Indeed, our scholarly organization was founded in response to my showing Elinor Ostrom that restructuring the data of experimental subjects' choices as sequences of choice in repeated n-person prisoner dilemma games demonstrated that actual choices differed wildly from the predictions of the traditional theory. When looked at in sequence, subjects' choices looked chaotic. Frohlich and I conjectured that this came about because subjects did not have "separable preferences:"[4] they were not self-interested in the classic sense. Inter-personal separability of preferences does not appear to be supported in contexts with salient group or shared goals. This includes contexts regarding public goods.

Further, in these contexts of making decisions regarding contributions to a public good, individuals seemed to update their expectations of others frequently. We proposed that in these contexts something like the Fehr and Schmidt (1999) notion of inequity aversion is what is happening.   We conjectured (Frohlich and Oppenheimer,2006) chaotic contributions arise from both a desire to avoid exploitation (i.e. doing more than one's share) and a *probabilistic* response to such exploitation. Our next paper (2010) demonstrated that deterministic theories fail and a

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2. Of course, there are many efforts to alter the foundations of analysis to include probabilistic choice (see for example, Regenwetter, 2008).

3. This is the subject of my last three papers: Frohlich and Oppenheimer, 2006; Wendel and Oppenheimer, 2010; and Oppenheimer, Wendel and Frohlich and 2011.

4. That is, separable preferences are where one's preferences are not a function of the preferences or welfare of others.

probabilistic theory, under specifiable conditions, can produce the observed pattern of contributions.

The final paper (2011) established both of these conjectures as necessary conditions for the explanation of the data. Further, any explanation of the behavior in the repeated n-person prisoner dilemmas was shown to require that individuals place a value on the group outcome beyond the valuation of their own gain. Specifically, the analysis implied 3 axioms regarding models of subjects' choices. These models of choices must:

1. Be probabilistic in the sense that both the attention they pay to any situation, and how their values enter into their calculations is inherently[5] probabilistic;

2. Allow for altruistism in that they show a separable concern for the group outcome beyond the stake the individual has for herself;

3. Allow for a concern for justice or fairness for self within the group. This is a second non-separable aspect of values in public good situations. Individuals care about their *relative* effort. They want to do their fair share but even more certainly do not want to be taken advantage of.

Further, the complexity of such a realistic approach can be incorporated into the analysis with little cost to calculability and yet can generate great improvement in the fit of models to non-market behavior at the individual level.

Consensus Regarding Justice

Given the laboratory and theoretical results, one can expect the weak forces (in the form of preferences influencing choices) for justice and the quality of the group outcomes to influence behavior quite regularly. Further, we can give these notions concrete yet quite generalized substantive forms because, for the overwhelming majority of individuals, experiments have shown the desires regarding these matters are extraordinarily similar.

Regarding the role of self in the group - overwhelmingly individuals want to 'do their share' but even more surely, do not want to be made a sucker.[6]

As identification with the group increases, the individual's concern for the quality of the *group* outcome also increases. But as those of you who are aware of the justice experiments I did with Norman Frohlich know, there is far greater consensus among individuals than this. Virtually all people can agree that society ought to provide for the basic needs of its members.[7]

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5. I say inherent because attention is determined by the relative weighting of the significance of the context. What catches one's attention determines the values that enter one's decision calculus. Attention, being a 'winner take all' system, means that one can not predict recalculation and hence the outcome of 'conscious choice' without knowing all the random elements in one's immediate decision environment.

6. Of course in these, as in other matters, little attention is paid to this aspect of the decision problem unless things get substantially out of balance. As things get more out of balance, the probability of the unbalance actively affecting their decision increases in conformity with a sigmoid function.

7. Such consensus can be revealed by simulating what Rawls referred to as a veil of ignorance. But the results are quite robust. Other experimental conditions reveal similar motivational structures (see Konow, 2003).

Naturally, outside the laboratory there may not be an environment that reveals such a consensus and so it may not be apparent. But given that it appears embedded in human nature, one would expect that as such needs are left unmet, these other-regarding preferences would rise in their salience and attention would turn to them. This would be supportive of those others who are relatively needy.

These then are the substantive 'take-aways' from the theoretical and behavioral research regarding the foundations. They have implications for our understanding and evaluation of social institutions. Political arrangements, after all, have to do with the realization of shared goals for members of a group.

IMPLICATIONS

Probabilistic Values and the Logic of Collective Action

Most fundamentally, traditional rational choice decision theory specifies that people have values, consider all their options in terms of these values, and then make their choices to maximize their return in terms of their own values. But people only consider their options when it captures their attention to do so.

Attention is known to have a 'winner take all' structure. Items that 'surprise' or 'pop out' capture our attention, as do innumerable other disturbances. Hence, what wins is a function of the many 'things' - some necessarily random - going on in their environment; our options or choices, *and how they are evaluated,* will be reconsidered only probabilistically. For example, imagine that you regularly give to a Police Benevolent Fund. Reconsideration of this regular behavior would take some doing – some disruptive happening that causes you to pay attention to this act of giving. Similarly, if you *didn't* give to them last year, some disruptive event sufficient to catch your attention and link it to the possibility of giving to the Fund would be required for you to reconsider your previous decisions.

How do such attention shifts occur? An event catches your attention because your set of values say "pay attention to this: *Now!*" Values that are stirred up to shift your attention and that then cause us to bring a choice point into focus will frame the way you look at that choice point. Those values will now weigh into your decision regarding that option. Given that what shifts your attention is often probabilistically generated by your environment, the particular values that you will bring to the choice will be probabilistically related to the choice point. Advertisers, marketing experts, and fund raisers are extremely aware of this.[8]

Such a conjecture is in line with conclusions of some keen observers. Take, for example, Popkin (1991). He argued voters pay attention to salient signals and reconsider their behavior when such a

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8. Other arguments have been made regarding probabilistic behavior and collective action. Most of them have to do with 'updating.' For example, Lohmann (2000) spelled out a plausible explanation for the fall of the Soviet Empire. She used the notion that potential protesters were updating their priors on the basis of news regarding 'yesterday's' protests. This was shown to lead to the possibilities of behavioral cascades. She conjectured such updating to be crucial in the understanding of recruitment to causes of all sorts. In her models the updates were with regard to the probability of the activity by others passing a threshold that made the individual's participation worthwhile. This model led to probabilistic behavior, but not quite in the manner that we discussed in the papers mentioned above. We would argue that the decision to consider updating is itself probabilistic as a function of attention.

signal is received. After such reconsideration, they turn off and don't bother digesting more information unless an even more salient signal is received. After that first signal the chance of a needed recalculation is often reduced. Most events would no longer pass the threshold to capture one's attention. Consider for example, Hispanic American voters' information regarding Presidential candidate Ford. They heard him say on TV that he had long loved Mexican tamales. While saying this, viewers could see that he failed to discard the tamale wrapping prior to biting into his tamale. Caught in the visual comedy, Hispanic voters had 'truth' revealed to them. Similarly, many Black - American voters found Kennedy's 1960 personal letter of support to the jailed Reverend King sufficient information to support Kennedy. Further information wasn't needed. Why? Because, after that act, further information was unlikely to rise to the level to catch their attention.

In any case, putting the 'attention' module in the calculation structure places an emphasis on salience: the role of publicity, propaganda, advertising, empty or even fake signals in the gaining of recalculation on the part of individuals. In a purely sterile (i.e. experimental) environment, such weak signals as a smiling face might cause unusual attention to one's options (see the experiments by Scharlemanna, Eckel, and Wilson, 2001).[9] Outside of the laboratory, where the individual is bombarded with suggestions demanding attention, one would need far more aggressive signaling to get most to reconsider what they are doing.

Outside the laboratory, choices of options in social dilemmas are clearly lubricated by the many attention getting devices of propagandists and community organizers. One can hardly conceive of a any historically important collective action that was solved without such strategic devices. Certainly those movements which were built on voluntary contributions required strategic consideration of garnering the attention (and support) of bystanders. This has been true of such international coalitions as cobbled together regarding ending slave trafficking, South African apartheid, Palestinian occupation, human trafficking, environmental degradation, and clitoridectomies. The same can be said for domestic collective action movements such as those in support of civil rights, income inequality, gay rights, etc. If attention is important to voluntary contribution at the group and societal levels, it must figure strongly in our analysis of individual decision making.[10]

Perhaps it is worthwhile noting that even noisy messages that have low expectancy of 'signal' or 'content' can pop out or catch one's attention because of their tapping of values plus their non-conformity with expectations. Unfortunately, as Madison Avenue can attest, the truth value of the content can be quite irrelevant to the message's efficacy. In fact, studies have shown that a message that 'pops out' with or without 'new' information (and even if the information is quite obviously false) may grab our attention and reenforce or change our opinion even unconsciously.

Indeed, it must be noted that not all that causes recalculation need catch one's attention.

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9. Weaker signals have also proved potent in sterile laboratory environments. If my memory serves me well, Rick Wilson reported a screen showing an inverted triangle (looking a bed like the shape of a head) also had statistically significant effects in generating cooperation in a lab experiment.

10. How attention attenuates over time, a subject that has been studied in the behavior of many animals, and in neuro-science, may help explain the general decline of contributions over time and in multi stage games in the laboratory. Indeed, this, rather than the standard 'learning the rules of the game' that has traditionally be used as an explanan, may be the major cause of declining contributions. Having subjects play multiple multi-stage games would allow one to test these alternative explanations.

Attention would seem to imply consciousness, and some stimuli can cause 'fear' and emotional change that would effect choices, even when they are not consciously attended to (de Gelder, et al, 1999).

In a world of multiple information threads, the design issues of attention getting and information delivery may well be primarily a question of decentralized design. Certainly these threads are increasingly tailored for and by the individual. In this new world, the incentive for the individual to design a thread to collect information about public good efforts is likely to be crowded out by her rational pursuit of the private goods about which information can be more efficiently gathered. Quite clearly, this shift is likely to increase neither 'group solidarity' nor 'group identification.' How this is likely to effect collective action in modern democracies will be interesting to see.

Non Self-interested Values and the Logic of Collective Action

Now consider how non-self-interested predilections affect our understanding and evaluation of institutions for the logic of collective action. Take the two dimensions of other regarding values that we have argued as necessary for explaining the data: 1) caring about the group outcome beyond one's individual stake in it, and 2) wanting to contribute to the success of the project but not to be taken advantage of.[11]

These other-regarding preferences have long been suspect by economists. Yet research in many fields has established empathic concern as a universal trait of our species (for example, see Dugatkin, 2006).[12] Concern for the welfare of others can take different forms, and is shaped by cultural expectations, but a positive concern for others is needed to explain the statistical patterns we see in individual behavior in n-person prisoner dilemma games in the laboratory.

Coupled with this is the second dimension, triggered by the decisional context, the desire for fairness: a function of the behaviors of others. Individuals want to do their fair share, but do not want to be taken advantage of. Tie this to the way attention focuses with a higher probability when the stakes are higher, and we begin to get a feel for the way the determinants of the individual decision interact with each other.

What then are the implications of these two elements for the nature of collective action and the institutional context of any such actions? Valuing the success of the group means that one's own relationship with the group will mediate this effect. Specifically, as one is more positively 'connected' to the group, one values the success of the group more highly. All aspects of group identity then can be show to be strategic variables in the organizing of group efforts to gain public goods. Getting people to feel more connected to each other, giving the group a more salient role in their lives, can be expected to increase the likelihood of both individuals contributing to a collective action and the amount that they would give.

Perceived group boundaries will determine, in part, group identification. Strong boundaries, even when membership is not chosen, can lead to a shared culture, solidarity. Both of these can

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11. Again, these factors, like all others enter probabilistically as a function of the importance (size, salience) of the signal in the decision environment.

12. We first explored the variety and prevalence of these forms, and hence the most obvious falsity of the self-interest axiom as formulated in economics in the late 1970's (see Frohlich and Oppenheimer, 1984).

increase expectations of not being 'suckered.' Other aspects of group identity can be strategic variables in the organizing for successful collective action. Members of groups riven by internal or political strife, ethnic animosities, and so on, can be expected to exhibit lower concerns for both the quality of the outcome for the group, and for doing one's share. On the other hand, threatened groups can heighten group identity and bonding and hence improve contributions from those who identify with the group. How this plays out for the individual will have to do with the individual's relation to the group boundaries, identity and culture.

Doing one's share and not too much more is yet another factor reflected in the response of individuals to solicitations of voluntary contributions for a group goal. This concern reflects a perception of the behavior of others, one of the analytic lines so fruitfully pursued by Ostrom and her team. As argued by her, this will be a function of the information and communication structures within a group: can members attribute who is doing how much. Lin discovered that those institutions efficiently bringing one's attention to individuals' behaviors regarding the social dilemma work better. She argued pinpointing shirking behavior to the attention of group members, and the delivery of social consequences for such behavior ought to be a design element in institutions within which collective action is encouraged.

Outside the laboratory, when many smaller scaled public goods are the norm and are supplied mainly with voluntary contributions, individuals may not be involved in calculations of fairness at their moment of decision. After all, many social interactions occur over and over again. And many of the group boundaries, and locales are chosen for multiple reasons (e.g. church and community memberships). Indeed, when memberships are chosen, expectations of others' behavior will play a part and reflect some expectation of a degree of fairness over the long haul without a need for continual recalculation. Individual attention to these matters will be episodic, and hence produce less erratic behavior outside than inside the laboratory.

Distributive Justice Values and the Logic of Collective Action

Often it can be hard to define 'pure public goods:' One person's 'goods' can be another person's bads. This is especially true in the complex decision environments of 'everyday' life. Experimental setups can obviate some of these difficulties however. And it is precisely such 'simplistically induced' experimental environments that let us study what is at the root of the collective action problem. If group identity is important, then, it is not much of a stretch to presume that, in general, groups that 'perform well' (i.e. are able, efficiently to deliver satisfaction of shared interests to their members) generate greater loyalty and stronger identification by the individuals who are members.

The simplest of the laboratory experiments are the n-person prisoner dilemma experiments. These usually have very little specifiable context. But by varying the cues (e.g. those smiley faces and inverted triangles of Scharlemanna, et al) one is able to manipulate performance in simple repeated n-person prisoner dilemma experiments. This would allow one to test for the relation between group performance and the development of group identity as a factor in future behavior.[13]

Let me turn to a particular aspect of group performance: the public good of distributive justice (Frohlich and Oppenheimer, 1990 and Frohlich et al, 1998). In experimental settings, groups chose

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13. Obviously this would involve the maintenance of group memberships over multiple multi-stage n-person prisoner dilemma games.

high progressive taxes to generate self-defined adequate patterns of support for those of low productivity. In doing so, the high productivity individuals are at first suspicious of the efforts by the transfer recipients, but come to notice that those on the bottom show their gratitude by actually increasing their productivity. So it develops that in those experiments, work efforts that generated private income also were shown to support, in a self sustaining and stable fashion, the redistributive system of justice that was financed with relatively high marginal tax rates. One could develop n-person prisoner dilemma experiments (see footnote 13) that generate asymmetric results to consider the relation between distribution and group identity and how this effects future behaviors re collective action in the group.[14]

IMPLICATIONS FOR INSTITUTIONAL DESIGN & CONCLUSIONS

For policy prescriptions and institutional architecture, the resulting picture becomes more complicated. For example, Garrett Hardin (1968)'s simplistic prescription - privatize to avoid commons problems, can quite easily be overdone: Privatization could lead to decreased identification with the group. 'Healthy' group identification is needed to maintain capacity for satisfying shared goals: what we might call an adequate public sector. The long term welfare of a society is related to its ability to solve its public good problems. No matter how much of these public goods are financed via taxes and other 'coercive revenue' sources, the fundamental responsiveness of governmental institutions will rely on a foundation of voluntary contributions – in the foundational sense of political activity of a concerned citizenry.

Information structures, and their effect on attention also must be attended to as an essential part of social engineering effort to facilitate voluntary collective action. When we consider the motivational aspects of individuals in this mix, we see that the 'weak forces' of other-regarding preferences are going to be mainly founded on the individual's feeling toward the group. Collective action problems are unlikely to be reduced to the story of rational self-interested individuals making choices.

Most strikingly, introducing these factors into the individual calculus, lead us toward some of the more traditional concerns of the political scientist and philosopher and to somewhat discount the factors identified by the means / ends, self-interested, micro economic incentive stories of the traditional economist. It refocuses the student of collective action to examine mobilization, group identity, propaganda, and so on. This doesn't obviate the consideration of the prisoner dilemma game aspects of the problem - but it should limit the reach of such models when it comes to institutional design and public policy.

Those in the business of marketing and journalism are very aware that at the root of decision lies inertia and the psychology of attention. What we pay attention to shifts as a function of the ever shifting salience of aspects of our environment. For years, we have incorrectly conjectured the nature of the collective action game as a pure n-person prisoner dilemma game. From this framework, experiments were designed to test conjectures premised on fixed preferences. Those experiments bore fruit and also difficulties that were brought to light by many in this institution.

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14. Presumably other efficient dimensions of performance would also generate increased identification with the group and subsequent contributions to support public goods provision.

But outside of these halls, most have come to accept the simplified n-person prisoner dilemma models as fact and then used the models to justify institutionalized public policies. It is time for a serious reanalysis of the theory of collective action to be developed, and tested. Only after that should we be applying our theories to structure our public policies.

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