Anarchy, socialism and a Darwinian left

Ellen Clarke

The Orchard, Little Ayton, Middlesbrough, Cleveland TS9 6HZ, UK

Abstract

In *A Darwinian left* Peter Singer aims to reconcile Darwinian theory with left wing politics, using evolutionary game theory and in particular a model proposed by Robert Axelrod, which shows that cooperation can be an evolutionarily successful strategy. In this paper I will show that whilst Axelrod's model can give support to a kind of left wing politics, it is not the kind that Singer himself envisages. In fact, it is shown that there are insurmountable problems for the idea of increasing Axelrodian cooperation within a welfare state. My surprising conclusion will be that a Darwinian left worthy of the name would be anarchistic.
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1. Introduction

Peter Singer wrote his book *A Darwinian left* aiming to correct what he sees as an error in Marxist thinking and wrest evolutionary theory back from the political right. As a far left utilitarian himself, Singer writes that the left should drop the idea of perfectibility and the paradigm of humans as Lockean blank slates, and make room for an acceptance of some relatively fixed attributes of mankind. Singer implores us to accept that human nature is not going to change in a hurry, so we should try to accept it and work with it. 'Those seeking to reshape society must understand the tendencies inherent in human beings, and modify their abstract ideals in order to suit them' (Singer, 1999, p. 40).

E-mail address: ellenclarke81@yahoo.co.uk (E. Clarke).

Singer's ideal society would be one that was on the side of the weak, poor and oppressed. For this left to be Darwinian, Singer needs to show at least that natural selection does not necessarily rule it out. To do this, he turns to evolutionary game theory, to a game theoretical model proposed by Robert Axelrod (*The evolution of cooperation*, 1984) in which it is suggested that cooperation amongst agents can be a strategy that is evolutionarily successful.[1] Singer claims that, 'the left can learn from Axelrod's work how to build a more cooperative society' (Singer, 1999, p. 51).

Singer's definition of the left is an inclusive one. To be left wing is to be for cooperation and for the underdog. Accordingly, he leaves the nature of the state in his Darwinian left scenario rather vague. In general, he seems to favour some sort of welfare socialism. According to this, Singer's ideal society would provide 'a strong safety net for those who are unable to provide for their own needs' (ibid., p. 50).[2] Yet in arguing for a Darwinian left he allies himself with classic anarchist figures such as Kropotkin and Bakunin, who rejected welfare socialism, safety net and all. The aim of this paper is to show, against Singer, that these forms of left wing politics—welfare socialism and anarchism—are not equally compatible with the goal of fostering Axelrodian cooperation. Singer's preferred system of welfare socialism turns out to be antagonistic to that goal. It is anarchism instead that can provide the conditions maximally favourable to the flourishing of 'TIT FOR TAT'.

In the paper we will be examining the idea, inspired by Singer, that a suitable goal for any modern political left could be to take the welfare state, as their best-so-far blueprint, and somehow get Axelrodian cooperation combined with, or prioritised within, that system.[3] To do this we need to look at what it is that allows Axelrodian cooperation to work. Axelrod's TIT FOR TAT mechanism depends very much on contingent features of the system in which it operates. I aim to make these features explicit so that we can see if they are contained in real political systems. If the welfare state does not seem to possess the features vital to TIT FOR TAT's survival, then we can conclude that this Darwinian left may not be a happy marriage. However, in examining a second system, anarchism, we will see that Axelrod's influence on the political realm need not end there.

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[1] It is crucial to concede that the conclusions of Axelrod's experiment are not universally agreed upon by any means (see for instance Binmore, 1998). Game theoretic modelling of cooperation has moved on since Axelrod's classic work, and will no doubt continue to develop. However, since Singer bases his arguments on the Axelrodian scheme, that is what this paper will exclusively deal with. For other perspectives you might look at Hirschleifer and Martinez Coll (1988) or Connor (1995). There is also a more recent book on the matter by Axelrod himself (Axelrod, 1997).

[2] Whatever Singer's considered and final views on political organisation, here he will be treated as a spokesperson for welfare socialism, as this is the position he appears to defend in *A Darwinian left*. Singer's precise politics are not easy to nail down elsewhere, but in an interview (Bailey, 2000, p. 30) we hear him saying, 'I would look at it in terms of meeting people's basic needs and providing for a certain level of comfort. I think the kind of thing you're talking about is if you could ensure that there are virtually no people whose basic needs for food, shelter, warmth . . . are not being met'.

[3] Although Singer talks elsewhere in his book (1999) about the state of nature and our evolved predispositions, he does not explicitly bring Axelrod's work in as a hypothetical explanation of our ethical evolution. Rather, I read him as seeing the experimental results of Axelrod's work as a tentative blueprint on how to improve our societies.

2. The Prisoners' Dilemma: a brief introduction

Readers familiar with Axelrod's work may wish to skip ahead to the next section. For the rest, the following summary will, I hope, highlight the features important for the argument of this paper.

A game theoretic structure is a computer simulation that can be programmed so as to represent different arrangements and combinations of 'players' in different situations. The simulations can then be run over and over, with each successive generation having its population decided by the outcome of the previous simulation. The more successful players will leave more 'children' in the next game. Run the simulations for long enough and often one or more player will emerge as evolutionarily victorious, in virtue of some small differences or chance occurrences. The simulations are usually designed to mimic certain games, and the players compete to win the game or accrue the biggest score or pay-off.

Axelrod takes his inspiration from what is known among philosophers and game theorists as the 'Prisoners' Dilemma'. The story is that two criminals, A and B, are being held by the police and each urged to inform on the other. Neither knows what the other will do and the results of their actions will be as follows:

- If A informs and B keeps quiet then A will be released and B will be imprisoned for ten years.
- If B informs and A keeps quiet then B will be released and A will be imprisoned for ten years.
- If each prisoner informs on the other then both will be imprisoned for five years.
- If each prisoner keeps quiet then both will be imprisoned for a mere six months.

The dilemma is less abstract when you realise it applies to any real life scenario that involves people trying to cooperate when they are tempted to cheat instead. For example, fishing or pollution control laws put people into Prisoners' Dilemmas because everyone is tempted to cheat but if everyone cheats then the outcome will be bad for all—there will be no fish/polluted rivers. More generally, a prisoner's dilemma is a game with a pay-off matrix of the form:

		Player 1		
		C	D	
Player 2	C	x,x	z,y	where $(y > x > w > z)$
	D	y,z	w,w	

What, assuming that both prisoners are acting in their rational self-interests, should prisoner A do? If B keeps quiet then he is better off informs so he can walk totally free. If B informs then he is better off informing too, in order to get five years instead of a possible ten. The dilemma is that whether B informs *or* keeps quiet, A is better off informing. However, the same rationale applies to B. So, rational self-interest leads both prisoners to getting five years in prison, when it was possible for them to cooperate and get only six months. This game suggests that cooperation or altruism is unlikely between the prisoners. However, Axelrod points out that most of us very rarely, if ever, find ourselves in such a predicament because most of our interactions do not occur in such one-off, isolated circumstances. Mostly we interact with the same people more than once or regularly. We fill

out tax forms every year, buy our milk in the closest shop and trade with the same coun-
tries. Axelrod thinks he can alter the classic dilemma to make it much more illuminating—
this is the iterated Prisoners' Dilemma. Do the prisoners' options change if the scenario
happens to them all the time?

Axelrod's solution involved inviting people from around the world to enter a program,
of their own design, into a tournament based on an iterated Prisoners' Dilemma. The rules
were simple; programs face each other one at a time and get to choose whether to coop-
erate or defect. They were aware of which program they were facing and had access to the
history of their interaction with that player, meeting them a total of two hundred times.
Points were allocated thus. I cooperate, you defect: 0 points. I defect, you cooperate: 5
points. Both defect: 1 point. Both cooperate: 3 points. The scores were accumulated over
the course of the interactions to identify a winner. There were fourteen entrants plus a ran-
dom program. Soon afterwards, Axelrod felt it necessary to hold a second round of the
tournament to reinforce the results. This time there were sixty-two entries. Also, all
entrants were given access to the results from round one in order that they might learn
from them. The number of interactions between programs was randomised so that no
one could know which interaction would be the last time they met a player.

In both tournaments there was a clear surprise winner, labelled 'TIT FOR TAT'.[4] This
was the simplest program entered and had the following strategy:

> On the first interaction with a program—cooperate. On each successive move after
> that—do whatever the opponent did last time. And that's it!

TIT FOR TAT faced many subtle, aggressive and highly designed programs, and although
it never actually beat any program in particular, it gathered the most points overall and
won both tournaments. That is, no program scored fewer points against TIT FOR
TAT. They just scored much fewer points overall against each other and TIT FOR
TAT emerged victorious.[5,6] Axelrod also discovered that whilst a population of defectors
is immune to 'invasion'[7] by individual TIT FOR TATs, clusters of TIT FOR TATs could
invade a group providing they have at least a small proportion of their interactions with
each other. TIT FOR TAT, on the other hand, is immune to invasion even from clusters of
defectors. Lastly, he states that the mechanism of TIT FOR TAT possesses a 'ratchet', in
that once present as a cluster in a population it can proliferate and ultimately become
dominant. In later chapters Axelrod backs up the results using historical and biological
examples. His overall conclusion and rousing parting words are: 'The key to doing well
lies not in overcoming others, but in eliciting their cooperation' (Axelrod, 1984, p. 190).

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[4] Entered by Anatol Rappoport.

[5] For full tournament data go to Axelrod (1984), Appendix A, p. 192.

[6] This meagre and abstracted data may not indicate much. Indeed Axelrod worried that the results could have
been substantially different if the distribution of entries had been. To control for this, he constructed a series of
hypothetical tournaments each with very different distributions of the types of rules participating. TIT FOR TAT
won five out of six. Next, he looked to evolutionary biology for a way to simulate future generations of a
tournament. He ran computer models where more successful rules became more prevalent in successive rounds. He
made the number of copies in the next round proportional to an entrants tournament score. He claims that the
process simulates survival of the fittest. The results of this model were that TIT FOR TAT never lost its original lead,
and by the one-thousandth generation was not only most successful but growing at a faster rate than any other rule.

[7] 'Invasion' is a technical term that Axelrod uses when a strategy succeeds in beating the score of an opposing
strategy.

3. A closer look at the preconditions for the success of TIT FOR TAT

> What accounts for TIT-FOR-TAT's robust success is its combination of being nice, retaliatory, forgiving and clear. Its niceness prevents it from getting into unnecessary trouble. Its retaliation discourages the other side from persisting whenever defection is tried. Its forgiveness helps restore mutual co-operation. And its clarity makes it intelligible to the other player, thereby eliciting long-term co-operation. (Axelrod, 1984, p. 54)

The truth is that TIT FOR TAT possessed a certain amount of luck in Axelrod's experiments. It is simply not true that it will be a successful strategy in all situations but only in a very precise set of circumstances. I will now try to make those circumstances explicit.

The requirements are intuitive once one understands the whole momentum behind TIT FOR TAT's success. TIT FOR TAT can flourish in mixed groups because cooperation yields a higher overall pay-off for two players than anything else. Therefore, a group of players using the strategy between themselves will tend to earn a higher aggregate score than players around them who are constantly cheating on each other. Obviously, it is easier and more efficient to get things done when people help each other. What stops TIT FOR TAT from being undermined by free riders, however, is the fact that it will withdraw cooperation from any player that tries to free ride, or who defects against them. The upshot of this for said free rider is that if they continue, none of the well-off group will cooperate with them and their own pay-off will suffer. If the free rider is intelligent, or experimental enough, they too will adopt the TIT FOR TAT strategy to increase their own score.

Now there is no mention here of any of the players being altruistic or acting out of considered judgement of what is for the good of all. The players simply act to maximise their own individual scores. But for the whole system to hang together there needs to be what one would intuitively like to call trust, but which actually need not even be sentient. The system will fall apart if free riders are not punished, simply because free riding will then be the most productive long-term strategy. So it is vital that each player is able to detect, remember and, next time they meet, punish a free rider by withdrawing their cooperation. Furthermore, it is vital that the players anticipate meeting all the other players in an interaction again, some time quite soon. Recall that a one-shot prisoner's dilemma is insoluble—the most rational thing to do is to defect. Only when the situation is iterated do the players stand to benefit by taking the risk of trying to establish cooperation. Again, the players are not altruists, and it is only rational to cooperate with another if there is a chance that your actions will benefit you, and the only way they can benefit you is if your cooperation is remembered and returned in the future.

For this intuitive picture to occur there are some fairly technical requirements that must be met. Axelrod hints at them when he states that 'the two key requisites for cooperation to thrive are that the cooperation be based on reciprocity, and that the shadow of the future is important enough to make this reciprocity stable' (Axelrod, 1984, p. 173). I will try to unpack this comment.

Scale. TIT FOR TAT can only stabilise in relatively small groups. This is because in very large, smoothly interacting (i.e. all players stand a roughly equal chance of meeting each other next) groups there will simply be less interactions in a fixed amount of time

between an arbitrary player x and player y. Where player x has lower expectations of meeting player y in the near future, he has less reason to cooperate. Below a certain level of expectation player x may find it unlikely that he will ever meet player y again. In that circumstance, he is in a one-shot Prisoner's Dilemma and would be best advised to defect. Therefore the group needs to be small enough so that players meet each other frequently.

Equality. Players in the model are exactly equal. This means they have equal power to cooperate or defect, and the pay-offs they receive for their choices are identical. There is no marginal utility differentiation making them value their pay-offs differently. If one player is so powerful that he can afford to defect against a weakling, even though he expects to meet him again, because future defection from the weakling will not concern the powerful player, then he has no motivation to establish cooperation.

Transparency. Although unaware of what the partner in any interaction is going to choose that time, all players have access to what that player did last time they met them. Their memory need not last any longer than one interaction previously though. This transparency is obviously essential in enabling the players to reciprocate whatever behaviour is brought upon them. Without it, the free riders would go undetected and not be punished.

Niceness. Axelrod's term, not indicative of any intentions or thought, merely meaning that for TIT FOR TAT to accomplish mass cooperation rather than mass defection it must start out with cooperation; it must not defect the first time it interacts with a new player. Otherwise a group of TIT FOR TATs could end up stuck in reciprocal defection.

Freedom. A strange word to use about computer programs, but I want to express really that the game the players are playing contains no other rules or motivating influences. There is nothing that influences TIT FOR TAT's decisions as to either cooperate or defect, other than what that partner did to them last time. There is no question of TIT FOR TAT choosing to defect because it decides that it cannot afford to risk only receiving a sucker's pay-off right now. This requirement obviously bleeds into that of equality, because players must be free to punish where necessary, so of course they must have the means sufficient to punish as well.

These requirements must all be met so that all players know for sure that their cooperation and defection will always be met in kind. Only then can TIT FOR TAT be an evolutionarily stable strategy.

4. TIT FOR TAT and the welfare state

Now that we have seen the subtle factors at play in the successful operation of TIT FOR TAT as a widespread strategy, and explicitly isolated five key parameters, we can begin to look at how one might hope to incorporate Axelrodian cooperation into a political scheme. Once we have a picture of the details of Singer's system we can begin the task of matching up, to see whether the society will exemplify the model in the relevant details.

I am assuming, as discussed, that Singer's ideal society involves some sort of welfare state. This, at least, involves a state or government—that is, a minority group of people (however chosen) who possess a monopoly on coercion in that state. To retain this monopoly they will require an army, to defend against competing states that may try to steal their monopoly. They need the monopoly on coercion to enable them to collect taxes from at least some of their citizens with which to provide welfare for others. To enforce the collection of these taxes will require laws, a police force, a judicial system,

prisons and administration. The operation of the welfare system will need to be organised at a national level to ensure equality. I hope that Singer will not object to any of these minimal features being necessary to the organisation of his ideal world.

Let us see what impact a welfare state would have on the five key parameters outlined previously: scale, equality, transparency, niceness and freedom.

Scale. Most societies at present are too large. TIT FOR TAT cannot work in a society of strangers who will never encounter each other again. Singer knows this and says it is no wonder that people living in big cities do not always show each other the consideration that is normal in small rural communities. Yet Singer does not propose altering the present sizes of societies. Instead he asks, 'What structures can overcome the anonymity of the huge, highly mobile societies that have come into existence in this century and show every sign of increasing in size with the globalisation of the world's economy?' (Singer, 1999, p. 52). The question is left unanswered however.

Any ruler wishing to have Axelrodian cooperation flourish in their land needs to have their society operating on a very local level so that the discount parameter is small. However without national coordination it is difficult how to see how certain responsibilities of a welfare state can be carried out, and carried out fairly. Redistribution of wealth, in particular seems to require national coordination, otherwise wealth will still be unevenly distributed between different local governances. If these national networks are kept in place, however, then the parameter of scale will be infringed and Axelrodian cooperation will not be able to operate because citizens will be involved in interactions with others who are too far away, and who are so unlikely to be encountered again that the discount parameter is huge. These individuals will have little or nothing to gain from making sacrifices in order to establish cooperation with each other.

Equality. A complete kind of equality must also exist between players if they are to be able to cooperate effectively and defect against each other. Individuals must have the ability to bribe and blackmail everyone else into cooperating with them and if there is too much inequality; of power, strength or money, then these will be empty threats and promises. A welfare state would act to redress financial inequalities through progressive taxation and redistribution. In this sense Singer is correct to stress that a Darwinian left, understanding the necessary prerequisites for mutual cooperation, would strive to 'avoid the economic conditions that create outcasts' (ibid., p. 53). Of course economic equality is very much a goal of the left, who already value it for its utility in promoting happiness. TIT FOR TAT coincides with the ideals of the left here, and evolutionary game theory can give socialists more ammunition in the fight for egalitarian economics.

However, although Singer does do the work of identifying economic inequality as a potential barrier to cooperation, power is not distributed entirely in synchronisation with money. The socialist method of enforcing economic equality may be possible only through huge inequalities in status or power or force, as possessed by a centralised socialist government. This, as much as economic inequality, will be the undoing of the cooperative model. Indeed, one criticism levelled at Marxists in particular is that they aim to do little more than replace the capitalist government they chase out. 'As soon as the radical party seizes power it will inevitably become the people's enemy' (Bakunin, 2001, p. 183). So, even assuming that Singer's state could succeed in maintaining *material* equality, that society nonetheless depends upon other inequalities. Coercion is concentrated in the hands of a privileged minority: the government. These individuals then have little or nothing to fear from defections from other individuals, and rationality would tempt them to defect. The

government officials, the police, and the judiciary are likely to end up free riding. The remainder of the society will be powerless to halt this corruption.

It obviously is not very original to contend that power corrupts people. What is different is the insight that this effect is not due to temptation by evil or Machiavellian urges. It is simply the rational behaviour of an individual who finds himself in a Prisoner's Dilemma where the pay-offs are tipped in his favour and he aims to gain the maximum possible pay-off. The upshot is that electing more virtuous candidates cannot stamp out corruption. It can only be stamped out by equalising the pay-off matrices so that cooperation is the highest paying strategy.

Transparency. People must be able to remember the outcomes of previous interactions with other people. They need to keep a tally of exactly who has been cooperating with them and who has cheated, so that they can reciprocate. This requirement rules out anonymous mediation. A system where retaliation and rewards are largely taken out of the hands of individuals and dealt with instead by a huge, faceless governmental agency makes it impossible for TIT FOR TAT to flourish. The state mediates between individuals, distancing them from one another and taxes come to replace empathy for fellow man. Lawyers rid people of the capacity to settle disputes alone. In relying on a mediator to carry out punishment and rewards we are left helpless in the face of the myriad mistakes, accidents and miscarriages of justice that will occur when such matters are being overseen by an anonymous inefficient bureaucracy. While these mistakes occur, the free riders who exploit them, such as by defrauding the benefits system, go unpunished.

In order for TIT FOR TAT actually to spread through a population we saw it must be the case that other players can easily recognise the strategy. They must be able quickly to work out how it operates and what response it will give to their own behaviour. But if countless levels of administration hide TIT FOR TAT's strategy, or if TIT FOR TAT does not appear to be an autonomous, uncoerced agent then its motivations and behaviour patterns will not be transparent to others.

It looks like several of the structures necessary to the welfare state contribute to a breakdown in transparency of interaction.

Niceness. This is a quality that individuals need to possess, and since I do not intend to discuss human nature I will simply state that Singer's society does not immediately seem to contain anything that would make this character trait impossible. It would be closer to the idealistic heart of the left if TIT FOR TAT had been a strategy that cooperated no matter what, that always turned the other cheek. But Richard Dawkins demonstrated that where there are 'suckers' there will also be cheats.[8] An eye for an eye might not sit as easily with the values of the left, but it works.

Freedom. Defection and cooperation need always to be real options for players. Where there are laws regulating behaviour players are no longer entirely autonomous agents. They lose the power to cooperate and defect according to their own strategy. It is true that people can still choose to break the law, but that adds additional costs to a choice, inevitably altering the pay-off structure in some circumstances. Because any judicial system is fallible, there will always be people who find a way to commit a defection without being caught by the state. Furthermore, those people know that the likelihood of the injured party returning the defection is smaller where that would be illegal. It would be more

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[8] Dawkins (1976), Ch. 10.

feasible to turn defection into a successful strategy when other parties have reasons not to punish you.

Furthermore, transparency is undermined when people are coerced. If agents act according to a law rather than out of a desire to establish cooperation, trust is undermined. The suspicion would be that cooperation would be withdrawn if the opportunity arose. TIT FOR TAT is not a strategy that could be made into law. It only works so well because it actually gives a high pay-off score. But making it law would simply put all players into a Prisoners Dilemma against that law—they can choose to obey it or break it, and their choice will depend on what they think they can get away with.

All in all then it seems that Axelrodian cooperation will not be able to flourish in the kind of society that I have guessed Singer would propose, because at least four out of the five necessary prerequisites will be missing (it is worth noting that this is not the least suitable society imaginable—there may be systems that would fail on all five counts).

5. TIT FOR TAT and anarchism

The model I next put forward resembles collectivist anarchism (Heywood, 1998, pp. 196–202). This ideology favours small-scale communities that encourage face-to-face interaction and complete participation in political affairs. There is no form of centralised control, no monopoly over forms of power and coercion. Organisation is to be carried out on a small-scale grassroots level, from the bottom up, and democracy is to be radical rather than representative, so that all have an equal say in matters of organisation, as well as equal ownership of the means of production. The minimal features of a system such as this will be negative rather than positive, that is, there is lots of emphasis on what the society does not include rather than what it does. There is of course a burden on an advocate of this sort of system to show exactly how the banned institutions will be prevented from reappearing, but we will not deal with that here. To be explicit, I am talking about a small-scale community, which has no government (power is distributed equally) and no laws (including, importantly, no property laws). Furthermore there will be none of the institutions that require a government for their maintenance, such as an army, police force, judicial system, taxes, state-owned currency or administrative bureaucracy. At this point it is important to emphasise the difference between this society and that which Singer was vaguely putting forward. Although Singer might not feel himself to be necessarily opposed to communitarian anarchist ethics, there can be no middle ground anarchist–welfare state. For key to my understanding of this anarchist society is the absence of law, the absence of state, the absence of any forced or litigated cooperation of any form.

Remember that for two players to settle into a robust pattern of conditional cooperation it is necessary that the cooperation is based on reciprocity and that the shadow of the future is long enough to make the reciprocation stable. For TIT FOR TAT to be a stable strategy in a group it is required that the group is not too large in **scale**, that there is rough **equality** amongst the players, that all interactions take place so that they are **transparent** to the players, that most players are **nice** (they will not defect on the very first game) and, finally, that all players have **freedom** over the choice of defection or cooperation. Will these preconditions be breached under an anarchist system as they were under a welfare state?

Scale. Anarchist cooperatives are intended to exist on a small scale where face-to-face interaction is key and contracts are maintained on a personal level between individuals. The biggest challenge here would be of preventing the groups from growing beyond an

acceptable size. Decentralisation of organisation would make it hard for larger groups to form, whilst radical democracy increases the likelihood of dissenting groups arising within communities. These groups will be free to leave at any time, bringing about the fissioning of any group that grows too large. Ideally the groups will be small enough so that the members know each other by sight, and deal with each other many times in a week. The aim is at the sort of 'community' described by Michael Taylor where relations between members are direct and many-sided (Taylor, 1982, p. 95). Anarchists want to undo the anonymity and distrust that have come with globalisation and urban sprawl. TIT FOR TAT is simply not a viable strategy in inner city London where one might buy one's paper from a different vendor every day. If the anarchist communities could maintain themselves on a small scale by frequent fissioning or other means then they will fulfil the parameter of scale.

Equality. Collectivist anarchists call for a radical democracy where there is precisely even distribution of power and control, giving the comprehensive kind of equality that Axelrod's model requires. There will be no governing minority who exist in an advantageous Prisoner's Dilemma with all the governed. There will be no police force struggling with the temptation to abuse their power. There will be no corrupt and free riding government officials. Quite simply, each member of the society will have equal political status. There will be no advantages or concentrations of power other than those that exist naturally amongst men (such as strength or cunning) and which, without any mechanisms of preservation, often average out. An immediate concern here will be that political equality might come at the expense of economic equality; that law and law enforcement will be necessary to prevent financial goods from accumulating in the hands of a minority. Against this the anarchist will claim that it is laws themselves, specifically property laws, which allow for entrenchment of economic inequality in the first place.[9] Without property laws individuals will not be able to accumulate money as landowners, money lenders or any other usurious occupations. It is true that there will be no egalitarian redistribution in this anarchist society, so there will not be exact economic equality. However there will no longer be the sorts of laws and norms that presently legitimise the accumulation of financial gains hugely disproportionate to desert. Furthermore in small stable communities, any stingy or exploitative behaviour will be frowned upon, causing embarrassment and discomfort, and potentially resulting in reduced pay-offs. Any wealth that results from cheating or defection against others (such as exploitative wage paying) will result in punishment. In small lawless communities it will not be viable to relish in your plenty while others go hungry.

Transparency. Mediation, such as through governmental agencies, in people's interactions makes it more difficult for individuals to keep check on the strategies used by those around them. Face to face interaction makes it easier for people to remember each other, and whether cooperation was forthcoming last time they met. In the small-scale communities featured in my model individuals will always deal with each other directly, allowing trusting relationships to build up and cooperation to become very robust.

There will be no bureaucratic red tape, no administrative hierarchy, no centralised planning and no division of responsibility. There will be no lawyers to drag out and profit from other people's Prisoner's Dilemmas. There will be none of the anonymity and division of

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[9] Taylor (1982), p. 95. Michael Taylor devotes a whole chapter in his book, *Community, anarchy and liberty*, to showing how equality can be maintained in an anarchistic community.

responsibility that allows people to 'pass the buck'. In such a community people will be able to identify defection rapidly and accurately, so free riders will not be able to hide behind administrative procedures and legal loopholes. Transparency will be well maintained in this anarchistic community.

Niceness. As within a welfare state, there does not seem to be anything inherent to an anarchist system that would undermine the capacity in individuals to take a risk and offer help to another. However, in an anarchist state there are no laws enforcing niceness, so individuals are allowed to drop this trait wherever they have been defected against. The welfarist's state, on the other hand, may be *too* nice.

Freedom. In the anarchist society individuals will be free to utilise the best defence against defection they have: retaliation. It will be retaliated against by the withdrawal of future cooperation from the injured individual until such a time as cooperation is resumed by the defector. Individuals will not have their hands tied by laws designed to remove their autonomy. Free riders currently benefit from the fact that most people have moral qualms about breaking the law and so will follow the law even where that means letting defections pass unpunished. In the anarchistic communities the task of retaliation will not be handed over to an anonymous and unequal police force that may or may not carry it out fairly. There will be no opportunity to cheat the system (for the defector will still have to live in the community alongside the injured party) and the result for the defecting individual will simply be diminished pay-offs. If he continues the defection his pay-offs will further decrease until such a time as he realises his behaviour does not pay and returns to cooperation. There will not need to be any system of punishment other than withdrawal of cooperation. The small size of the community will increase awareness of particular crimes. The recipients of defecting behaviour will not feel exasperated with a system of punishment that is inefficient and inaccurate. There is also a much reduced chance of innocent individuals being unfairly targeted.

Axelrod comments that 'no central authority is needed: cooperation based on reciprocity can be self-policing' (1984, p. 174). What I have wanted to make clear is that this comment does not go far enough; not only is central authority not needed, but its very existence would make Axelrodian cooperation decay. It will actually flourish best in a community without such central authority: some kind of anarchistic community.

6. Wholly cooperative anarchy or partly cooperative socialism?

The welfare socialist may respond that the above analysis, while correct so far as it goes, does not go far enough to show that a Darwinian left must choose anarchism. All the analysis shows is that anarchism is more conducive to Axelrodian cooperation than welfare socialism. But for anarchism to be an inescapable choice, something much more surprising needs to be shown: that anarchism alone is conducive to Axelrodian cooperation. For whilst Axelrodian cooperation may be one good in the Darwinian left's eyes, it would be silly to suggest that it is the primary good. On the contrary, there are many other goods that the left holds dear, such as equality and order, for which they may well be prepared to compromise a degree of TIT FOR TAT. Even if a welfare socialist state will never achieve optimal levels of spontaneous cooperation, by applying Axelrodian measures it might achieve higher levels than it otherwise would, and without compromising its other ideals. So the challenge is that the Left can consistently accept a less than full degree of Axelrodian cooperation and still be called Darwinian.

Before the response to this challenge is given, it is important to be clear about any limitations. The scope of this analysis is restricted to examining very specifically that arrangement which is singled out by Singer as exemplifying a happy union of the left and the Darwinian. The focus is thus limited to Axelrod's model alone. We are assessing the coexistence of welfarism with a TIT FOR TAT population. To do this we must simply decide whether Axelrodian features could be instantiated in a welfare state without destroying those features of the environment (the parameters again) that, in Axelrod's model, are so crucial to the maintenance of a stable equilibrium.[10]

For the original model I came up with a common sense interpretation of the parameters that I think is useful to bring in again. For TIT FOR TAT to be the most successful strategy, I said that players must be able to 'detect, remember and, next time they meet, punish a free rider by withdrawing their cooperation'. They must also anticipate meeting each other player again soon. It is easy to see that this would be easiest in the kind of small community groups that anarchism suggests. What is harder to see is how a welfare state could achieve these conditions. I see two possibilities.

One is that the welfare state structure is altered so as to mimic these conditions. It would have to split into many mini states and reduce intervention to the extent that it would be difficult to see how the welfare part would be maintained and the mini states would start to resemble anarchist communities. *Or*, as I suspect is more appealing to the left, the welfare state could try to preserve cooperation by carrying out the TIT FOR TAT behaviour on its citizen's behalves, through policing, law courts and prisons. Instead of people spotting free riders in a face to face interaction, the state is responsible for finding them and punishing them and deterring them from defecting again through the promise of punishment. This absolves the citizens from the need to carry a mental catalogue of all the people they interact with, from the need to exact punishment … indeed from the need to cooperate at all.

With the first option the welfare state disappeared, and this time we seem to have lost cooperation. Of course people will or will not be cooperating with the state itself, but that is a whole new interaction in which one side possesses a perfect monopoly on coercion, an unequal game which we saw earlier is no good for the practising of TIT FOR TAT.[11] It

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[10] The narrowness of this scope can be defended with reference to the intuitive sense that the parameters make. It may indeed be the case that there are political arrangements that might satisfy all the left's demands in terms of welfare structures, whilst also encouraging a high level of free cooperation amongst its members, but it is only Axelrodian cooperation that will be discussed here. Indeed, we could suggest using systems of punishment and reward to alter pay-offs so that non-cooperation is a less appealing option. However, as we already have in place a system of punishments and rewards—the judicial system—it is hard to see how this is an application of Axelrodian theory in particular.

[11] This game is between random citizens and state officials. In a game of Prisoners' Dilemma played between a citizen and an official we actually have a different pay-off matrix than in the original because the players are not equal. The imbalance in power between the two individuals means that the official is free to cooperate or defect, because a/b has little recourse to retribution. In fact, by defecting the official is likelier to conserve resources, so he might even be motivated to cheat all the time. The only way out of this paradox and into cooperation is to ensure that the official has no advantage over the citizen in terms of money, power, knowledge or anything. They must be on equal terms. But if the official has no power advantage then it is difficult to see what he could do to enforce any of the laws that he is there to officiate. If his choices place him in conflict with an official of higher rank, that is, if he is likely to be caught and punished for corruption or taking bribes, then the pay-offs for these actions become proportionately smaller. But the buck stops somewhere, and in such a hierarchy there will always be someone at the top, who finds himself in a privileged dilemma with all other players.

looks then like a Darwinian left cannot choose to sacrifice a degree of Axelrodian coop-
eration in exchange for welfarism. Indeed the two goals seem to be mutually exclusive
in practical terms.

It is possible to go further than this rather definitional argument however and argue
the more general case, that any state or government will erode the possibility of spon-
taneous cooperation amongst its citizens. Once a majority of interactions are being med-
iated, TIT FOR TAT is no longer a stable strategy even for those interactions that are
left. This is because the scale of interactions will be too few, too infrequent, with too
many strangers and too open to possible intervention by the state. In mediated interac-
tions we frequently do not even know the identity of the other party. Richard Sennett
argues compellingly that cooperation is a skill we need to practise and that constant
habituation to mediation robs us of our ability to settle disputes or come to agreements
independently:

> Really 'decentralized' power, so that the individual has to deal with those around
> him, in a milieu of diversity, involves a change in the essence of communal con-
> trol, that is, in the refusal to regulate conflict. For example, police control of
> much civil disorder ought to be sharply curbed; the responsibility for making
> peace in neighborhood affairs ought to fall to the people involved. Because
> men are now so innocent and unskilled in the expression of conflict, they can
> only view these disorders as spiraling into violence. Until they learn through
> experience that the handling of conflict is something they have to deal with,
> something that cannot be passed on to the police, this polarization and escalation
> of conflict into violence will be the only end they can frame for themselves. (Sen-
> nett, 1971, p. 164)

We need only look to cases of neighbours suing each other over centimetres of garden
space, or parents dragging their children through messy divorces on the advice of their
lawyers, to see that there may be some truth in this.

Anarchists such as Bakunin believed that social solidarity is a deep rooted social and
communal instinct that is suppressed in contemporary society by the artificial nature of
the state. This should not be taken as saying that spontaneous cooperation is impossible
in a welfare state. Indeed, our own society contains constant reminders of the degree of
reciprocity that people are capable of. Friendship is often based on give and take and
friends can form groups that carry out high levels of conditional cooperation within
their group, such as buying drinks in rounds.[12] Yet although these things and more
can happen in our society, they are not attributable to the state. Indeed many (such
as Napster) can only flourish where the government takes a very non-interventionist
approach. The examples given are more clearly understood as mini oases of anarchism
in an otherwise controlled state. The important thing is that these types of community
only flourish where they are not intervened in, or where there is no other provision for

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[12] eBay is an even better example of a conditionally cooperating community for in this case we can actually
observe attempts being made to reinforce the very same parameters as I have outlined (users generate a profile
where other users can view all past interactions and their outcomes, and can leave feedback on those profiles that
will affect that player's success in future trading. Free traders are quickly spotted and then shunned by all users).

the goods they give access to.[13,14] So even if we can imagine a welfare state comprised of many small villages (although this is not straightforward—doesn't there still need to be broad scale interaction between villages for it to be considered one state?) and we can admit that TIT FOR TAT might flourish in these villages in those areas where the state typically does not intervene (the domain of favours, petty trade, information exchange, etc.) the point remains that this example would clearly not be one involving the maximisation of conditional cooperation.

Poppies sometimes survive the weed killers that are sprayed on farmers' fields. This does not mean that these fields can be endorsed as optimally healthy growing environments by the existence of those poppies. Other, much more encouraging conditions can be imagined for those poppies to grow in. In the same way, we do not need TIT FOR TAT to be nonexistent within welfare states in order to argue that there are better possible societies in which it could flourish. The idea of prioritising Axelrodian cooperation within a welfare state is akin to trying to prioritise poppy growing within a wheat field. Whilst they may grow side by side, they will remain in competition with one another, and if the poppies are truly prioritised then it will cease to be a wheat field in due course.

7. Conclusion

It was suggested at the start of this paper that Robert Axelrod's game theoretic system of cooperation might be used to reconcile Darwinism with left wing politics. To this end Peter Singer suggested that a left wing state could model itself on Axelrod's system. However, in examining the requirements of Axelrod's system we saw that any welfare state would be not only less than ideal, but ultimately incompatible with the operation of Axelrodian cooperation. In fact, any society with a governing state would fail to satisfy the five preconditions necessary for TIT FOR TAT to work. On the other hand, we found that an anarchistic society might closely match Axelrod's model in the relevant features. Only by reducing its own intervention, and thus moving *towards* a more anarchistic model, could a welfare state hope to encourage and increase the scale of TIT FOR TAT operation within it. In conclusion, it is anarchism, not welfarism, that can provide the conditions maximally favourable to the flourishing of TIT FOR TAT. While we might fall short of drawing conclusions about a Darwinian left, we can conclude at least that an Axelrodian left would be anarchistic.

It is important to be clear about what has not been said here. I have not shown that cooperation is impossible in any society that has a welfare state. I have merely demonstrated that a welfare state will not fulfil the conditions necessary for *Axelrodian* cooperation. Neither

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[13] Titmuss (1970), Ch. 4, showed that blood donation, a good example of pure altruism (there is no possible gain to the donor for they remain anonymous) actually takes place at a higher rate in England where all donation is voluntary, than in America where people can be paid to donate blood. It is an example of a voluntary and unselfish behaviour being more prevalent when there is no other arrangement for the provision of a good.

[14] 'If, and when, a major disaster happens, the fire and emergency medical services (EMS) will not be able to meet the demands of the community . . . People will have to rely on each other for help in order to meet their immediate life-saving and life-sustaining needs. Under these conditions family members, fellow employees, and neighbors will spontaneously try to help each other. Following the 1985 Mexico City earthquake, 800 people were saved by untrained, spontaneous volunteers. However, 100 people lost their lives while attempting to save others' (Kirkwood, 1997). In emergency situations people often take far greater risks for strangers than they normally would. Often this is when they perceive themselves to be the only source of help.

have I attempted to endorse anarchism beyond its capacity for Axelrodian cooperation, either practically or theoretically. Lastly, my analysis has been restricted in its scope to just two alternative political arrangements, when many others, such as end-state Marxism or market fundamentalism, could also be of interest.

Acknowledgements

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