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Poverty eradication: the need for good citizenship

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This paper makes use of game theory to argue that poverty and inequality can be understood as the outcome of a repeated game in which the players are caught in a poverty trap, or "prisoners' dilemma". They can escape this dilemma by means of co-operation and co-ordination, requiring appropriately designed "institutions" or "game rules". However, such institutions or game rules may be only a necessary, not a sufficient condition for this. From the perspectives of evolutionary biology and evolutionary psychology a case is made for the indispensability of good citizenship to poverty eradication.

Armoedeverligting: die noodsaaklikheid van goeie burgerskap

In hierdie artikel word daar vanuit 'n spelteoretiese perspektief geargumenteer dat armoede en ongelykheid die resultaat is van 'n herhalende spel waarin die spelers in 'n armoedevalstrik of "prisoniersdilemma" vasgevang is. Hulle kan uit hierdie gevangenskap ontsnap deur koördinering en samewerking waarvoor gepaste "instellings" of "spelreëls" nodig is. Gepaste instellings/spelreëls is egter wel 'n nodige, maar nie 'n voldoende voorwaarde vir koördinering en samewerking nie. Insigte uit die evolusionêre biologie en evolusionêre psigologie word gebruik om te argumenteer dat goeie burgerskap noodsaaklik is vir armoedeverligting.

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The levels and distribution of poverty in the world remain shocking.[1] Over one billion people have to make do with less then US $1 per day. Each day about 35000 children under the age of five die of starvation or from preventable infectious diseases. In Africa in particular, the levels and persistence of poverty remain cause for global concern. About 35% of Africa's population of almost 700 million people is estimated to be food-insecure, with famine currently threatening millions in southern Africa.

On a global scale, poverty is accompanied by great inequalities in wealth and welfare (cf Milanovic 2002). The distribution of income and wealth in the world is such that by far the majority of people born into the world each year, are born into poverty. However, people are not starving because of a global lack of food and medical services, but rather, as Drèze & Sen (1989) have shown, because they have lost their "entitlement" to food.

There are many ways in which people can lose their "entitlements" and end up marginalised and in poverty. It is argued in this paper that poverty and inequality can be understood as the outcome of a repeated game in which the players are caught in a poverty equilibrium, or "Prisoners' Dilemma", to use the jargon of game theory. They can unlock this dilemma by means of co-operation and co-ordination mediated via appropriately designed "institutions". As will be stressed in this paper, it is only in an open, democratic society with a free press and watchdog organisations, an independent judiciary, enforceable property rights and contracts that human rights can flourish, and that people can progressively achieve their entitlements. Such a situation has been described as providing "good game rules for society".

However, having good institutions or game rules may be only a necessary, not a sufficient condition for the realisation of entitlements. As Bowles & Gintis (2000: 2) have remarked, "Good rules of

1 An earlier version of this paper was presented, by invitation, at the National Research Foundation (NRF) Seminar on Poverty Eradication in support of the World Summit on Sustainable Development, University of Fort Hare, Alice, South Africa, 21 June 2002. I am grateful to many participants for their useful comments as well as to two anonymous referees for useful suggestions. However, all errors and omissions are my sole responsibility.

the game [have come to] … displace good citizens as the *sine qua non* of good government". Moreover, changing institutions from bad to good may be a non-trivial aspect. It will be shown that recent advances in evolutionary biology and evolutionary psychology support this statement and that good citizenship is essential to poverty eradication. The message is that society can be saddled with inappropriate institutions, or (time-inconsistent) institutions that require costly and non-credible enforcing and monitoring mechanisms. Good citizenship should complement the changes in institutions. Good citizenship may be dependent on culture, and culture will depend on the norms (shared values) of a society. It is known that culture and norms tend to persist over time and can be dependent on insider-outsider distinctions that are "morally repugnant" (Bowles & Gintis 2000: 1). What kind of norms and culture are appropriate for poverty eradication? In this paper it is argued that norms and culture should support strong moral values and altruism within an environment based on individual human rights. Such an environment could facilitate innovation, economic growth and possibly better societal outcomes for all in a manner consistent with Rawls's (1971) difference principle of justice.

To put the emphasis on good citizenship in perspective this paper reviews, from an economist's point of view, some contemporary answers to the "big questions" on the wealth and poverty of nations (especially of Africa). Scientists have grappled with these for many decades and in some cases centuries. Adam Smith, the "father" of modern economics, subtitled the first book of the *Wealth of Nations* (1775):

> Of the causes of improvement in the productive powers of labor and of the order to which its produce is naturally distributed among the different ranks of the people.[2]

It is essentially a discussion on the sources and consequences of scientific and technological advance. Ever since Adam Smith, science and technology have run (though not without criticism) like a golden thread through explanations of welfare and poverty, most notably in

2 This issue continues to fascinate social scientists more than 200 years later. As recently as December 2001, Acemoglu *et al* (2001) asked in a paper in the influential *American Economic Review*: "What are the fundamental causes of the large differences in income *per capita* across countries?"

Schumpeter's notions of entrepreneurial innovation giving rise to "creative destruction" of the old methods of doing things; in Solow's (1957) neo-classical growth model (where it enters exogenously embodied in physical capital), or more recently in the endogenous "new" growth models of Romer (1990), Lucas (1988) and others. It is clear from these contributions that technology can contribute to poverty eradication not only by generating economic growth, but by improving health, nutrition, productivity, education, communication and entertainment. In answering the "big questions" on wealth and poverty, science and technology will be regarded as beneficial, and the question posed will be: How do our norms and values facilitate scientific innovation?

The following "big questions" have preoccupied scientists and decision-makers: What is poverty? Why are some people (or regions) poor and others not? Is there any long-term possibility of convergence in welfare between the currently poor and rich countries? If good policies are necessary for growth and poverty alleviation in the short term, why do so many politicians enact and perpetuate bad policies?

1. What is poverty?

Economists often refer to income poverty when defining poverty.[3] Thus, a lack of income will indicate poverty. This is established by expressing the proportion of individuals or households below an arbitrary poverty line expressed in money terms. For instance, the international poverty line is currently estimated at US $1.08 per person per day. According to this measure almost 25% of the world's population lives in poverty. However, the inadequacy of income as a measure of "poverty", as well as the many problems associated with its measurement, have been discussed in depth in the literature. For some time now, broader notions of poverty have thus been used. Perhaps the best known is the United Nations' Human Development Index (HDI), which considers low life expectancy and high illiteracy as important aspects of poverty.

3 The Millennium Development Goals of the United Nations refer to income poverty measures in their goal of halving the number of people below the international poverty line by 2015.

The "basic needs approach" identified the "basic" goods and services without which a person would be deemed to be poor, and was the first approach to be supported by an implicitly Rawlsian sense of justice, through its focus on the poorest members of society (cf Rawls 1971). The basic needs of the poorest of the poor include housing (shelter), sanitation, food (nutrition), clothing and transport.

More recently, motivated by the work of Sen (1999), the notion of "poverty" has been broadened. In his "capabilities approach", poverty is seen as vulnerability, lack of empowerment and lack of entitlement. For a number of reasons economists increasingly support this approach or concept. It has led to the important realisation that, unless poverty is understood as a violation of human rights, the desire to eradicate world poverty is not likely to be successful. This has been inferred from research on the second major issue identified above, namely why some people are poor and others not. This line of research strongly supports the understanding of "development as freedom".

In line with the view that development is freedom, the 1986 UN Declaration on the Right to Development stated that development is a human right and the Declaration of the 1993 UN World Conference on Human Rights called it: "an inalienable human right and an integral part of fundamental human freedoms". This view was confirmed at the UN global conferences on Population and Development (Cairo) and on Women (Beijing) and at the World Summit on Social Development (Copenhagen). Thus, the UNDP (1998) declared: "Poverty is a human rights violation, and freedom from poverty is an integral and inalienable human right".

The emphasis on human rights and the need for cultures and institutions which enforce human rights is fundamentally important (cf also Jansen van Rensburg *et al* 2001). This is because, as will be shown later, community/social cohesion is required to enforce norms and values, which is important for appropriate growth-enhancing institutions. Communities can also fail, in particular if social cohesion is founded on insider-outsider distinctions or subject to grossly unequal power relations.

Having dealt with an important prerequisite for poverty eradication, namely the proper understanding of what constitutes poverty, the next question can be addressed, namely why some people are poor

and others not. This question refers to the distributive aspects of poverty. Thus any attempt to answer the question must focus not only on the determinants of poverty *per se*, but also on the closely related issue of the determinants of inequality. The level of poverty and the degree of inequality in poverty are now valid criteria in what are termed social welfare functions. This inclusion has become accepted as it has become clear that inequality can be an obstacle to the alleviation of poverty.

2. Is convergence possible?

2.1 Geography and institutions

Two peculiar features of global poverty and wealth are that they tend to be geographically spread in a particular manner and that, with some exceptions, poverty (at least in the relative sense) seems to persist historically. From these observations it is clear that location matters: where one is born on the planet will have a significant influence on the quality of one's life.

While these observations are far from new and are, in fact, obvious on some reflection, the disturbing implication that poverty may persist in certain spatial pockets (see eg Jalan & Ravallion 1997) or even nations has lead to a significant literature concerned with convergence or, as Pritchett (1997) describes its empirical reality, "Divergence, big time".

Scientific explanations of divergence (or slow convergence) between geographical areas and the persistence of poverty have, over the past decade, identified a number of "big stories" as explanations. These "stories" are about historical accidents (technological accidents via inventions that accumulate in path-dependent fashion), geography (climate, distance, topography and biology), institutions (including culture and laws) and policies (rising transaction costs and uncertainty).

Diamond (1998: 15) poses the question of why poverty and wealth are unequally distributed across the world. His explanation is that geography plays a role, particularly in terms of climate and the environment for food production. The latter, according to him, gave

rise in Europe to fire-arms and other technology, widespread literacy and the political organisation necessary to sustain programmes of exploration and conquest. In Sub-Saharan Africa (still the world's poorest continent), however,

> [f]ood production was delayed by Africa's paucity of domesticable native animal and plant species, its much smaller area suitable for indigenous food production, and its north-south axis, which retarded the spread of food production and inventions (Diamond 1998: 398).

Reader (1998: 3) concurs that Africa's topology and climate, rather than its people, had a defining impact on its welfare. He points out:

> While the out-of-Africa population grew from just hundreds to 200 million in 100 000 years, and rose to just over 300 million by AD 1500, the African population increased from 1 million to no more than 20 million in 100 000 years [...] and yet both groups were descended from the same evolutionary stock [...] the divergent history of the two groups implies that Africa itself was in some way responsible.

Acemoglu *et al* (2001a; 2001b) have recently argued against the dominant influence of geography, claiming that differences in poverty are due to differences in societal institutions. Thus the view is that societies or regions which provide incentives and opportunities for investment will be richer than those which fail to do so.

The geographical hypothesis was tested against the institutional hypothesis by Acemoglu *et al* (2001b). They considered the impact of European colonialisation on welfare in colonies and found:

> Historical and econometric evidence suggests that European colonialism caused not only a major change in the organization of these societies, but also an institutional reversal — European colonialism led to the development of relatively better institutions in previously poor areas, while introducing extractive institutions or maintaining existing bad institutions in previously prosperous places (Acemoglu *et al* 2001b: 4).

It was easier for the European colonial powers to settle and transfer their institutions to poorer, less populated areas such as Australia, New Zealand and North America than to more prosperous and populated areas such as tropical Africa. The subsequent "reversal of fortune" experienced by these areas is consistent with the institutions

hypothesis but not with the geography hypothesis, since the underlying geography and climate remain unchanged.

Acemoglu *et al* (2001a: 1377) emphasise that it is not necessarily the case that Africa is poorer than the rest of the world because of geographical or cultural factors, but because of worse institutions. Apart from the high population densities and relatively prosperous communities in places in Africa that prevented large-scale settlement by European settlers, their thesis is that African institutions are worse because high settler mortality in the era of colonialisation (due to malaria, yellow fever, and so forth) precluded the successful transplanting of colonial institutions. They find a strong and significant negative correlation between *per capita* income growth and high rates of mortality. In this way the interaction between geography and institutions is emphasised. Thus geography is still important, as it can determine the type of institution that is created.[4]

Lal (1998) attempts to answer the question of the importance of the colonial institutions from the point of view of economic welfare. In other words, why the European institutions which were transplanted to the colonies of Australia, North America and New Zealand were good for poverty eradication. The view shared by Lal (1998) and Acemoglu *et al* (2001b) is that the West's culture of individualism and norms approving individual material advancement encouraged institutions of private property. During the subsequent Industrial Revolution generated by science and technology, "[t]he age of industry created a considerable advantage for societies with institutions of private property" (Acemoglu *et al* 2001b: 37). Intellectual property rights, the protection of innovations through patent rights, and institutions such

4 The effects of geography on welfare may be better discerned within a country, where institutions are more likely to be similar across space. Within many countries, including South Africa, significant spatial inequality in the distribution of poverty and output may be observed. Naudé & Krugell (2002) estimated the determinants of sub-national economic growth rates across 353 towns and cities of South Africa over the period 1990-2000 (a period characterised by significant institutional change with the fall of apartheid in 1994) and found evidence for the interaction of geography (transport costs, distance from ports) and institutions, finding higher welfare in even the poorest areas after 1994 despite the relatively unchanging spatial distribution of income.

as subsidies and learning organizations are acknowledged in the literature on endogenous growth as being essential for economic growth and development (cf Temple 1999). The benefits of science seem to be difficult to generate without the appropriate institutions of private property and the norms and culture on which such institutions rest.

One needs to turn to game theory[5] to understand how norms and culture can determine institutional evolution. In this context, poverty will first be described as the outcome of a Prisoners' Dilemma.

2.2 Poverty as the outcome of a Prisoners' Dilemma

In the previous section it was seen that poverty alleviation and eradication (as well as convergence) are possible, but not inevitable. Indeed, the unequal distribution of income and wealth can be interpreted, from recent advances in evolutionary biology and game theory, as the result of a Prisoners' Dilemma. In a Prisoners' Dilemma the only evolutionary stable strategy (ESS)[6] is defection, even though mutual cooperation yields a higher payoff. As illustrated by biologist Maynard Smith, once an ESS is achieved it will stay: selection will penalise deviation from it (cf Maynard Smith 1974 & 1982).

The welfare implications of an ESS are often not the best that a population can do for itself. Improved outcomes require high levels of co-ordination and policing of agreements, because incentives for opportunistic behaviour by certain members will be high. This result is known as the "Prisoners' Dilemma", where a Nash equilibrium is found that results in lower than available individual welfare. It has often been applied in economics to trade negotiations, to explain why cartels collapse, among other things. A classic overview is given by Rapoport & Chammah (1965). In the following paragraphs a very simple example is used to illustrate the Prisoners' Dilemma.

5 Gintis (2000: 240-1) therefore proposes that evolutionary game theory be seen as a possible unifying force for the behavioural sciences, stating: "Game Theory is a general lexicon that applies to the behavior of life forms, providing the tools for carefully modeling the conditions of social interaction, the characteristics of players, the rules of the game and the informational structure".

6 An ESS can be defined as a strategy/behaviour which, if adopted by most members of a population, cannot be bettered by an alternative strategy.

Consider the decision faced by a member of a rural community as to whether to make a large or a small voluntary financial contribution to the municipality's coffers for the provision of free food aid parcels. It is assumed that this game is played only once, with decisions being made simultaneously and no co-ordination being possible. If he/she makes a large donation, and all other members of the community make a similarly large contribution, everyone will benefit optimally and share in the high value of the food aid parcels. However, if the single member thinks that everyone else will make a large contribution he/she can obtain even larger individual gain by making a small contribution, since he/she will share in the value of the food aid parcels and have more money left for discretionary spending. These different decisions and pay-offs are summarised in the following matrix.

		Member B of the rural community	
		Large contribution	Small contribution
Member A of the rural community	Large contribution	5.5	1.6
	Small contribution	6.1	2.2

In the above matrix, the figures in the cells are completely imaginary, but serve to indicate the pay-off (welfare) accruing to the various members of the community depending on the decision. The first value is the pay-off accruing to member A and the second value the pay-off accruing to member B (the rest of the community). Thus in the upper left-hand cell, if both members make a large contribution, they each get 5 "units" of pay-off. It is clear from the matrix that with no co-ordination and with each member aiming for the optimal personal pay-off, each would choose to make a small contribution, resulting in the pay-off of 2 each reflected in the lower right-hand cell — much less than they would have obtained if both of them had made a larger contribution!

This merely crude example is intended to illustrate the principle that in the Prisoners' Dilemma a co-operative outcome yields high benefits for all. However, it is not achieved because every individual has the incentive to defect from such an arrangement. The resulting mutual defection produces low benefits for society as a whole (Hargreaves Heap & Varoufakis 1995: 135).

Overcoming this low benefit equilibrium often requires coercion, for instance government legislation or co-ordination. Some examples in African countries are in the public sphere: employment equity, nepotism, environmental protection and road safety; and in the private sphere: labour shirking and moral hazards in firms and families. All of the control mechanisms for coercion and compliance are costly and imperfect. The lack of investment in Africa, the major reason for slow growth and persistent poverty, may itself be the ultimate outcome of a "Prisoners' Dilemma" in which firms, and labour unions and politicians find themselves.[7]

Kreps (1990: 182-3) sees the persistence of such sub-optimal equilibria for society as being due to "an inertia in institutions that mirrors the inertia in equilibrium expectations". Equilibrium expectations are the product of long-term experience (*ie* history) by a society of boundedly rational and retrospective individuals. Different institutions will lead to different "game" rules and thus different (hopefully better) outcomes for the players of the game. The current "game" of economic growth and development results in the outcomes we perceive. To obtain better outcomes we need to play a different game, or change the rules. For that, our "institutions" (broadly defined) must adapt and evolve — which, in its turn, requires equilibrium expectations to change.[8] This will depend on the extent

7 In the case of South Africa, Gelb (2001) claims that potential investors perceive high underlying inequality in South Africa and attach an interpretation of unresolved conflict between labour and capital to it: "Firms do not feel that they have sufficient control over the future distribution of returns to their activities [...] they identify high risks of losses through private criminal acts [...] or fear far-reaching policy shifts" (Gelb 2001: 21). If labour and/or capital sees this as a zero-sum game the sub-optimal prisoners' dilemma result could be obtained.

8 Indeed, as early as 1957, Pigou, the father of contemporary welfare economics, saw the slowness of institutions in responding to change as a major obstacle to improving welfare.

to which culture (and its norms) can change in a way that generates "good citizens". Akerlof (1979) has shown that norms, social custom or "standard business practice" frequently operate as effective constraints on individual optimising behaviour. Bowles & Gintis (2000) have argued that community enforced norms and values can overcome market or government failures. Arrow (1971: 3) has recognised that a lack of trust in a society could lead to a Prisoners' Dilemma type of outcome, stating:

> In the absence of trust, opportunities for mutually beneficial co-operation would have to be forgone [...] norms of social behaviour, including ethical and moral codes (are) [...] reactions of society to compensate for market failures.

2.3 Evolution, norms and culture

Development in evolutionary biology and evolutionary psychology offers important insights to economics, and is indispensable if economic science is to offer guidelines for the future evolution of human society and institutions. This is not a new insight: as early as 1948, Alfred Marshall (1948: xiv) stated: "The Mecca of economics lies in economic biology rather than economic mechanics", and in the nineteenth century Veblen (1899) asked: "Why is economics not an evolutionary science?".[9] Evolution recognises path-dependency. This suggests that our current institutions are the result of past behaviour influenced by past norms. According to Nelson & Winter (1982: 10):

> The regularities observable in present reality are interpreted not as a solution to a static problem, but as the result that dynamic processes have produced from conditions in the past.

As a result of evolutionary theory, there has been an improvement in our understanding of complex, evolving systems such as our social and cultural institutions.[10] One feature is the increasing relevance of

9 Cf also Nelson & Winter (1982) and Hodgson (1999).

10 Hodgson (2001: 297) defines institutions as "durable systems of established, embedded and potentially codifiable social rules and conventions that structure social interactions". According to North (1990: 3) institutions are the "rules of the game", while Veblen (1919: 239) described institutions as "settled habits of thought common to the generality of men".

Darwinian evolution to human psychological and social behaviour.[11] Hodgson (2001: 280-1) argues that a Darwinian evolutionary approach is more illuminating than either systems theory (cf Kornai 1971) or complexity theory (cf Cohen & Stewart 1994) since these offer too much of "general insights [...] the missing link is a connection between different levels of analysis relating to general and specific phenomena".

The importance of Darwinism for the social and economic sciences has been emphasised in Dawkins's (1983) idea of "universal Darwinism". As described by Hodgson (2001: 281),

> [t]he basic idea is that complex systems are likely to contain some replicating entities, which are subject to some processes of selection. Clearly, at the biological level, DNA is an example of a replicating entity. But at the social level, the replicating entities are very different. They include social routines and social institutions.

He describes how social systems are subject to essential evolutionary principles by virtue of the existence of variety, replication, inheritance and selection.

These evolutionary principles apply to social institutions and individual human attributes, as suggested by Veblen (1899). Because some institutions (including routines and habits and patterns of thought) are particularly useful to the survival of individuals in a society — such as production, acquisition and protection institutions — they lead through evolution to the emergence of cultural and other mechanisms for their transmission across generations. Habit, learning by doing, and imitation are important mechanisms in this regard.

Habit, defined as "a more or less self-actuating disposition or tendency to engage in a previously adopted or acquired form of action" (Camic 1986: 1044) is clearly useful in human survival as decision-making device, as it facilitates faster action and acts as a "filter" for information from the external environment. Human beings' propensity to habits, and the manner in which habits are formed and translated into behaviour are due, according to evolutionary psychology,

11 Evolution can be defined as "cumulative and transmissible change" (Durham 1991: 20) or "the sequential transformation of a system of replicating entities" (Patrick 2001: 142).

to the fact that we have more instincts, not fewer, than most other animals. These instincts were shaped in the human brain to promote survival during our evolution as hunter-gatherer societies during the Pleistocene age. All behaviour thus comes back to biological advantage and all human beings have a common underlying and innate psychology (cf Tooby & Cosmides 1990 & 1992).

Dawkins (1976) and more recently Blackmore (1999) generalised habits to include patterns of thought, ideas, religious impulses and even consciousness under the description of "memes". The *Oxford English Dictionary* defines a meme as "an element of culture that may be considered to be passed on by non-genetic means, especially imitation". Dennett (1995) sees memes as ideas that are passed on, in essence information running through an evolutionary algorithm. With memes as a second replicator in addition to genes, Blackmore (1999) explains many important aspects of human behaviour, such as culture, religion, art, and institution-building, not necessarily as having biological advantages, but as vehicles for the transmission and spread of "memes" (*ie* memes use human behaviour to get themselves copied). The importance of memes as cultural units of inheritance is that cultural evolution is not primarily based on genetic evolution, although the two tend to co-evolve (cf Durham 1991).

Individual habits help to sustain behaviours that mesh together in a structured social context, forming customs and routines. In turn, culture can be seen as a system of interlocking customs and routines (Hodgson 2001: 293). Evolutionary biology sees culture as knowledge and norms[12] which are passed from parents to children, from social practices and leaders, and from peers. Institutions are formed to help preserve and reproduce these habits of thought and norms. Just as a habit has a decision-making advantage for an individual, institutions (and social cohesion) can create stable expectations of the behaviour of others. In the language of institutional economics, this can lower the transaction costs of engaging in survival activities (cf North 1990). History therefore matters for the present, since "we are all born into a world of pre-existing institutions" (Hodgson 2001: 297). Moreover, because evolution tends to proceed in a path-

12 Norms are defined by Gintis (2001:2) as including "values, beliefs, standard practices and other objects of cultural transmission".

dependent and incremental way, analogous to the case of biology, any current institutions will carry aspects of their past, whether currently useful or not, simply because they were successful somewhere in the past. This implies that society can possibly never have "optimal" institutions, or firms which perform "optimally" as is assumed in neoclassical economics, because complex social systems, like biological systems, will always carry "baggage" from the past. It also implies that while technology forms a golden thread in human progress and wealth creation, existing social relations may limit the possibilities for technological change (cf Nicita & Pagano 2000).

From the above it can be concluded that inefficient and inappropriate institutions supported and perpetuated by "unfit" habits and norms can become inflicted on society to the extent that biologically "unhelpful" memes are replicated by human beings' propensity to form habits. Veblen (1914: 25) described this as the "triumph of imbecile institutions over life and culture". Being stuck with inappropriate institutions and unco-operative citizens is the dominant explanation for persistently high rates of poverty and inequality in the global economy (eg Acemoglu *et al* 2001; Rapoport & Chammah 1965). On the other hand, as Young (1998) has pointed out, complex, apt solutions can emerge over time in a world populated by simple agents, given sufficient variation and the selection of alternative solutions.

Thus, in order to change institutions, society needs to change its habits and thoughts, including its cultural paradigms or worldviews.[13] The latter gives rise to norms — for instance the cosmological worldview of the West gave rise to norms supporting individualism and personal material gain (Lal 1998).

What is the relationship between evolution, norms and the interpretation of poverty as a Prisoners' Dilemma? The answer is that norms and values — morality — can be important in providing solutions to "unlock" the Prisoners' Dilemma without costly coercion and control. Three aspects are worth stressing.

13 Particularly relevant in the debate on global poverty are the need for and consequences of changes in technological paradigms. As suggested by Freeman & Perez (1988: 38), changes in technological paradigms require "social and institutional changes [...] to bring about a better match between the new technology and the system of social management of the economy".

The first, and perhaps most revolutionary,[14] is based on Immanuel Kant's "categorical imperative". This provides a rational basis for morality, namely that one should undertake those actions which, if taken by everyone, would yield the best outcomes. Overgrazing land, polluting the environment, and tax evasion are all examples of behaviour that becomes immoral as it violates the categorical imperative. The extent to which our norms are based on rationality can be questioned, however, given certain evolved personal traits that will be identified below.

Secondly, altruistic human behaviour can be of strategic value to individuals and has a rational basis in evolutionary biology. The evolutionary biologist Richard Dawkins (1976) states: "good guys come first". In repeated Prisoner Dilemma games, with suitably low rates for discounting future benefits, the strategy of reciprocal altruism (or tit-for-tat with high levels of forgiveness) provides a better income (cf Hirschleifer & Rasmusen 1989). Forgiveness, reciprocal altruism and co-operation can result from a socially cohesive community. Bergstrom & Stark (2000) show that (even in a one-shot Prisoners' Dilemma game) co-operative behaviour is more likely to be sustained in environments where relatively successful organisms are copied relatively often, and where organisms that have the same role model are more likely to interact with each other than with randomly selected members of the population. This points to the importance of communities sharing similar norms/values and of social cohesion, to ensure enforcement of those norms/values.

The effect of social cohesion is to increase the probability that members who interact today will interact in the future — *ie* the "game" becomes a "repeated game". This creates an incentive to act in socially beneficial ways now in order to avoid retaliation in the future (Bowles & Gintis 2000: 7). A large body of social science research confirms the prevalence of altruistic behaviour, for instance in blood donation, voting in elections, environmental care and protest, and the maintenance of voluntary welfare organizations — all instances where private individual material benefits are small, free-booting is easy and strong incentives exist to defect. Gintis (2001)

14 It is revolutionary as it sees rationality not as a means to an end, but as an end in itself (Hargreaves & Varoufakis 1995: 156).

has recently shown how altruism and norms that reduce individual payoffs can be sustained in an ESS.

There is however, an evolutionary legacy that can potentially make altruistic behaviour difficult, namely the tendency to social hierarchies with ingrained behavioural patterns that raise the relative status of an individual in society. Barkow (1992) is of the opinion that institutionalised social hierarchy is too recent a phenomenon to have been selected by evolution, as it is unlikely to have existed in the small hunter-gatherer societies that characterised more than 90% of human existence before domestication developed. He sees the emergence of social stratification as a result of three psychological traits of all hominids, namely the pursuit of high social rank, nepotism and the capacity for coalition-forming. These traits were formed by biological evolution (Falger 2001: 39).

The social stratification resulting from human beings' psychological traits against the backdrop of science-induced domestication has created not only disparities in income and wealth but also in social power. This in itself becomes a source of cultural inertia and habit enforcement. Dominant classes[15] or nations use coercion, authority and their agenda-setting capacity to control cultural transmission, constrain the choices of the weak, and impose their own beliefs, practices and institutions. These discourage innovation, deviance or dissent (Patrick 2001: 146). In addition to psychological traits promoting one's own relative status, social stratification and asymmetrical power relations, there are also problems with social group formation, which can discourage trust and mutually beneficial co-operation. These problems refer to the tendency of individuals to seek membership of groups of similar individuals, leading to insider-outsider (us versus them) distinctions. Often, as Bowles & Gintis (2000: 14) point out, insider-outsider distinctions are made on "morally repugnant cases such as race, religion, nationality or sex". This often leads to narrow-mindedness and ethnic hostility. For example, Schelling (1978) shows that integrated neighbourhoods and communities would make everyone better off, but will prove unstable if individuals are free to relocate.

15 Marxists have long since rejected the possibility of a "national interest" in the presence of class conflict, seeing little way out of the Prisoners' Dilemma.

Thirdly, and perhaps partly related to altruistic behaviour, there is the role of norms in productivity and in generating acceptable incentives for a market-based economy. It has been argued, for instance, that the norms of Confucian societies enable those economies to solve the Prisoners' Dilemma within firms without costly contracting or monitoring. The importance of norms in guiding human decision-making depends (by definition) on their being shared in a society. According to Polanyi (1945) the incentives of the market economy are only effective when the norms of society place value on private material gain. Lal (1998) argues that the rise of such norms was particular to the West, in particular via the institution of the Catholic Church.

Having dealt with the question of why there is so much disparity in welfare in the world, and having indicated that the answer to greater equality and enhanced welfare lies in overcoming the Prisoners' Dilemma type of lock-in situation through institutional change based on morality, the next section attempts to answer the question of why policies that are bad for poverty eradication are often perpetuated by well-intentioned politicians.

3. Why are bad policies perpetuated?

Poverty alleviation requires good government policies; bad policies can exacerbate poverty. Typical good policies include those that promote a stable and open macroeconomic environment, accountability and inclusive public institutions, and which encourage investment in health, education and social safety net programmes (cf Ritzen *et al* 2000).

However, Ritzen *et al* (2000: 1) aptly summarise the apparent paradox, that:

> The majority of politicians understand both intuitively and substantively what these good policies (or best practices) are, and most have the best of intentions with respect to trying to bring about a better life for all in their country. But if this is so, why do too many 'good' politicians end up standing for, defending, or perpetuating policies that undermine rather than advance general prosperity?

They answer this question by arguing that politicians experience significant social and institutional constraints when they attempt to

bring about reform. Furthermore, they point to the fact that such constraints are shaped by the degree of social cohesion within a country. Social cohesion in this sense refers to the inclusiveness of communities. Such inclusiveness generates the trust required for reforms to be implemented. They find that countries that are divided along class and ethnic lines will be characterised by low social cohesion (Ritzen *et al* 2000: 3). Game theory suggests that such societies are unlikely to escape from a Prisoners' Dilemma since the iterability of the game is jeopardised. In Africa, the high incidence of HIV/AIDS and its dramatic negative impact on life expectancy can now be seen to pose a significant threat to good citizenship: not only does it lower the iterability of a game; it also raises the discount rate of future benefits, thus creating strong incentives to defect from co-operative solutions. The combination of HIV/AIDS and high poverty makes poverty eradication extremely difficult. Banerjee & Newman (1994: 211) note that if those living in poverty make less credible commitments as a consequence, this may keep them in a poverty trap:

> The poor are closer to the lower bound on their utility than the rest of the population. Consequently, threats of punishment work less well against the poor than against others: the poor behave as if they have nothing to lose. The poor then find it harder than everyone else to borrow and insure.

Socially cohesive communities are often able to enforce norms because a considerable proportion of their members is willing to engage in the costly monitoring and punishment of shirkers without a reasonable expectation of being repaid for their efforts (Bowles & Gintis 2000: 8). In light of the tendencies towards insider-outsider distinctions, narrow-mindedness and intolerance in many socially cohesive groups, it is imperative to ensure that communities enforce the right kind of norms.

How do countries keep their societies cohesive during times of significant change and transformation? This question becomes critical to attempts to alleviate poverty during times of social change, when broad systemic transformation challenges existing systems of economic, social and political organization (Ritzen *et al* 2000: 10). There is significant empirical evidence from Africa correlating its

high degree of ethno-linguistic fractionalisation (low levels of social cohesion) with poor policies (cf Temple 1999; Sachs & Warner 1997).

Social cohesion will break down in the face of the social exclusion caused, for example, by unemployment and the denial of rights to certain categories of the population, especially minorities. The HIV/AIDS pandemic in Africa has also been seen to foster social exclusion due to stigma. A human rights culture is necessary for building social cohesion and for lessening bad social cohesion, for instance where it leads to group formation on a racial, religious or sexist basis.

The particular challenge facing many countries in Africa is that (civil) war and conflict have destroyed much of the social capital of traditional societies (Collier 1999). The transformation of society often weakens traditional authority relationships, while migration severs community ties. In Africa this destruction of traditional social capital has often occurred before new social capital has been created. The challenge facing African nations is that, unfortunately, social capital and social cohesion cannot be imported from the outside world, but have to be developed. Unemployment, intolerance, ethnicity and stigmatisation due to HIV/AIDS are major social obstacles to be overcome in creating an appropriate social cohesion in most African countries.

Some of the implications from evolutionary game theory for the creation and distribution of wealth and poverty through institutions have to do with altruism, co-operation and envy, as well as the high degree of social stratification that we observed concomitantly with high inequality and persistent poverty. Narayan (1999) sees norms and values as important tools for shaping social cohesion and solidarity among previously stratified groups. He states that solidarity within social groups creates ties (bonding social capital) that bring people and resources together. Especially in unequal societies, ties across groups (bridging social capital) are essential for social cohesion and for poverty reduction. It is therefore important for Africa to support education, the media and the public information policies that reinforce norms and values of tolerance and diversity.

4. Concluding remarks

At the start of the twenty-first century, societies face frustration in translating anti-poverty findings into successfully implemented policies because their institutions have been inherited from past eras informed by past generations' norms and values, and as such may be inefficient for the present. In many instances, particularly in Africa, civil war, conflict and HIV/AIDS have destroyed social capital and social cohesion and made credible commitments by economic agents difficult to achieve. In many instances the change processes of development (eg rural-urban migration and the adoption of new technology) have also destroyed the social capital of traditional societies through changes in norms and the social mechanisms enforcing them. Transformation of society often weakens traditional authority relationships, while migration severs community ties. In Africa this destruction of traditional social capital often occurred before new, "appropriate" social capital could be created.

The challenge facing African nations is that, unfortunately, social capital and social cohesion cannot be imported from the outside world, but have to be developed. This may perhaps be the greatest development challenge facing countries such as South Africa. High (and escalating) unemployment, religious and racial intolerance, ignorance, ethnicity and stigmatisation due to HIV/AIDS are, in this light, major social obstacles to be overcome in creating an appropriate social cohesion in most African countries. If the New Partnership for African Development (NEPAD) is to be successful, it would have to go beyond its recognition of good game rules (eg good rule, regular elections, property rights) to include good citizenship of Africa based on commonly recognised and accepted norms and values. (It goes without saying that Africa's leaders and politicians must also set an example as far as good citizenship is concerned).

These are important tools for shaping social cohesion and solidarity among the very many stratified groups in Africa. Solidarity within social groups creates ties (bonding social capital) that bring people and resources together. Especially in unequal societies, ties across groups (bridging social capital) are also essential for social cohesion and for poverty reduction — Africa cannot afford social or class formation by insider-outsider distinctions on morally repugnant

bases such as race, religion, politics or gender. Good citizens are those who adhere to and promote norms and values of tolerance and diversity, and who recognise individual human and property rights and create incentives for innovation and co-operation. In this sense good citizenship is essential to the eradication of poverty in Africa.

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