

Explaining unintended developments with cultural selection theory

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ABSTRACT

Cultural selection theory has been rejected by many social scientists. The objections against this theory are listed and commented. Some of the objections can be dismissed as expressions of preference for one perspective over another. Different perspectives lead scientists to make different kinds of discoveries, but all perspectives are valid, and no theory or perspective can cover all aspects of social phenomena.

The limitations of cultural selection theory are discussed and some improvements are proposed. It is concluded that cultural selection theory can explain certain phenomena that other theories cannot explain, especially phenomena that are unplanned or unintended.

INTRODUCTION

The idea that culture can evolve by selection is almost as old as Darwin's theory of natural selection. Many different versions of cultural selection theory have been proposed throughout the years, and many versions of this theory have been criticized, and with good reason, for being inadequate (Fog 1999).

In most areas of science, a discovered inadequacy of a theory typically leads to modification or refinement of the theory. Only when another theory explains observed data better, is the inadequate theory rejected (Lakatos 1974). The history of the social sciences is different, however. Social systems are so complex that every rule has exceptions. The consequence of this is that every testable theory can easily be falsified by examples that it fails to cover. All too often, testable theories of social phenomena have been rejected rather than refined or replaced with an equally testable theory. This has led to a shortage of testable theories and models with predictive power in the social sciences. One such theory, which many social scientists have rejected, is the theory of cultural selection. I will therefore discuss the criticism that has been raised against this theory and propose ways of meeting the criticism. The most sophisticated criticism has been voiced recently by Schatzki (2001). His article therefore deserves special attention.

Selection theory, in its most general form, says that a selection process can take place when the following three elements are present:

- there is a class of entities which can be replicated or extended in time or space
- there is variation among these entities
- different variants have differing properties which causes them to be replicated or extended differentially

The most popular version of cultural selection theory is memetics. It regards instructions, rules, ideas or practices as replicating entities. These instructions, or *memes*, are transferred differentially from person to person in an evolutionary process (). However, not all versions of cultural selection theory require the replication of information units, as later examples will show.

In the following paragraphs, I will discuss each of the objections against cultural selection theory.

OBJECTION 1: GENERAL OBJECTIONS AGAINST CAUSAL MODELS

There is a long-standing debate among social scientists about whether a nomothetic science and causal models of social phenomena are possible and relevant. There is no reason to repeat this debate here, as adequate arguments for the possibility and relevance of such a

science have been presented elsewhere (Martin and McIntyre 1994; McIntyre 1996; Blute 1997).

OBJECTION 2: CULTURE IS DIFFERENT FROM BIOLOGY

Many critics of cultural selection theory have focused on disanalogies between biological and cultural processes. Based on simplified accounts, these critics believe that a close analogy with biology is necessary for evolutionary processes to work (Henrich, Boyd & Richerson: Forthcoming). Some of the most important disanalogies between the two processes are (Fog 1999):

- The selection of genetic traits is tied to the birth and death of individuals, while cultural traits can change many times through the lifetime of an individual under the influence of many different selection mechanisms.
- Genetic traits can be inherited only from the two biological parents, while cultural traits can be transmitted from any person to any other person.
- Genetic mutations are blind, while cultural innovations may be the product of rational planning and goal-directed problem solving.
- A new gene usually replaces an old one, while cultural knowledge may be cumulative, so that old ideas are still remembered after new ideas have been introduced.
- Culture does not have a universal information unit analogous to the gene, but is capable of storing many different types of information.

Many models of cultural evolution have rightly been criticized for ignoring some of these differences (Hallpike 1985). The analogy between biological and cultural evolution is useful as a source of inspiration and as a metaphor in the study of cultural evolution, but no conclusion should be drawn on the basis of this analogy without taking the fundamental differences between the two processes into account.

OBJECTION 3: CULTURAL SELECTION CAN BE REDUCED TO SITUATED AGENCY

Some theories explain cultural selection events as the consequence of intentional human action in a social environment that restricts the number of possible actions. Schatzki (2001) argues that this account makes cultural selection theory superfluous as it can be reduced to a theory of situated human agency.

The important difference between selectionism and theories of situated agency, which the critics ignore, is a difference in *perspective*. Selectionism seeks explanation in the properties of the entity being selected, while a theory of agency focuses on the properties of the person choosing the same entity.

It is worth delving more into the question of perspective, as this has been the basis of many scientific debates. Different perspectives make scientists focus on different aspects of a phenomenon. This makes them ask different kinds of questions and make different kinds of discoveries. Gaziano and Gaziano (1999) present an elegant example of this. By applying four different perspectives, they are able to construct four different contributions to the understanding of the knowledge gap between social classes. These four perspectives are obtained by combining two dichotomous dimensions: whether phenomena are represented as naturally occurring or as voluntary human constructions; and whether phenomena are analyzed at the individual level or the collective level. All perspectives are valid; they just represent different foci of attention. Unfortunately, researchers sometimes commit to a certain perspective and corresponding set of methods as the only true one (Gaziano and Gaziano 1999). Many unproductive scientific debates can be translated to the argument that perspective *A* fails to cover aspect *b*, while ignoring the counter-argument that perspective *B* fails to cover aspect *a*.

The situated-agency perspective is anthropocentric, while the selectionist perspective is non-anthropocentric. To explain this difference, I will present the following example. Assume that we ask two different persons why a particular song has become popular. The first person answers, "*Because people like the melody*", and the second person answers, "*Because it has a*

catchy tune". Both answers are perfectly acceptable, and in effect they are saying the same thing. The first answer represents the anthropocentric view, saying that people's tastes are matching the melody, while the second answer represents the non-anthropocentric view, saying that the melody is matching people's taste. Swapping subject and object here does not affect the truth of the statement, only the focus of attention.

This is the key to understanding cultural selection theory. By moving the focus of attention away from the supposedly rationally choosing person to the attributes of the thing being chosen, we make it easier to understand unintended consequences of the choice being made (Marsden 1998). The words of the song may contain a political message and this message may have less influence than the tune on people's decision to sing the song. Any political consequence of people listening to the song is thus unintended by the singer; and this unintended consequence is most easily explained by reference to the catchy tune.

Memes that spread without benefiting the people who hold them, are often compared with viruses. This metaphor helps understand the parasitic or "selfish" nature of the meme's tendency to spread (Dawkins 1993; Brodie 1996).

A third possible focus of attention is the environment and social structure, which may determine the number of possible choices a person can make, or make certain choices easier or more difficult to make. Focusing on such structural constraints also represents a non-anthropocentric view that can have importance in cultural selection models.

There is a further limitation of the anthropocentric perspective that needs to be mentioned. By focusing on the person who holds and propagates a particular idea, we fail to compare the propagating idea with potentially competing variants that were propagated less, or not at all. This is a reductionist fallacy. Just like the evolution of a biological species is an emergent phenomenon, which cannot be explained by looking only at individual events of birth and death, the evolution of a belief, or set of beliefs, may also be an emergent phenomenon, which cannot be explained by looking at individual believers. This is further explained in the following paragraph.

OBJECTION 4: CULTURAL SELECTION CAN BE REDUCED TO RATIONAL CHOICE

Most selection events involve people making conscious choices. According to Schatzki, this affirms a convergence between selectionist and rational-choice approaches to human activity, because the adaptive advantages of practices are identical to the benefits they bring people in particular environmental circumstances (Schatzki 2001). This claim ignores the most important discovery in memetics: the selfish meme (Dawkins 1976, 1993). The adaptive fitness of a meme is not necessarily identical to the adaptive fitness of the person holding the meme. What is good for the reproductive fitness of a computer virus is certainly not good for the computer or its owner. Likewise, a chain letter containing false claims that compel people to copy it, can spread without benefiting anybody (Goodenough and Dawkins 1994).

Memetics has really proved its power to explain irrational behavior in its analysis of religious cults and sects. A sect is seen as a complex of memes that spreads as a whole package. The success of the sect depends on the effective cooperation of these memes. One meme serves as an allure to make the sect look attractive to new potential converts. Other memes control practices that effectively brainwash new members with the whole meme complex. There are also memes that serve as defense against rivaling beliefs. There are memes that tell the members to proselytize and introduce new members. There are memes to punish defectors. And there are memes, which make the members devote all their time and money to the benefit of the sect. None of these memes would survive alone, but when propagating as a meme complex, the sect can be quite successful (Dawkins 1993, Lynch 1996, Brodie 1996).

The crucial point is that such a meme complex can evolve into an optimized reproduction machine without any of the sect members understanding why. Theories based on rational human agency cannot explain the efficiency of the abovementioned mechanisms without assuming that sects are skillfully constructed by crooked charlatans. While this may be true of some sects, it certainly does not apply to them all. Nobody starting a new sect will be able to invent such a successful meme complex without copying memes from existing

sects - memes that have evolved and proven their fitness through a long history of development.

This example clearly shows the power of selection theory to explain unintended developments. No other known scientific theory can explain the origin of a well-functioning machinery like a sect if it is not the result of intelligent planning.

OBJECTION 5: THE THEORY CONFUSES CAUSE AND EFFECT

By defining selection as whatever causes replication to be differential, it is no longer a distinct explanation but simply a label for whatever does the explaining, Schatzki argues (2001). A similar criticism has been applied to the theory of biological evolution. The famous expression "*the survival of the fittest*", which was coined by Herbert Spencer, involves the same problem. When fitness is defined as the ability to survive, then "*the survival of the fittest*" becomes "*the survival of the survivor*", which of course is a tautology (Peters 1976).

This confusion of cause and effect is not a weakness of the selection theory itself, only of certain wordings of the theory. If *selection* is used as a name for the cause, then we need another word for the effect, for example *evolution*. If *selection* is used as a name for the effect, then we need another word for the cause, as in the expression "*selection by consequences*". To use the word *selection* for both is sloppy language, I must admit.

OBJECTION 6: EXACT REPLICATION IS NOT POSSIBLE

When an idea is transferred from one person to another, it is not actually copied, but translated, interpreted, inferred or reconstructed in a possibly different version. Hence, the transfer of memes is not replication, but resemblance, Schatzki argues (2001). Furthermore, it has been shown that information may be transformed and altered while stored in memory under the influence of other memory traces (Heyes and Plotkin 1989).

However, the selection theory not only allows variation, it *requires* variation for an evolutionary process to take place. Henrich and Boyd (2002) have shown mathematically that even very incomplete, inexact, and biased transmission of information is sufficient for an evolutionary process to take place under relevant conditions. For the sake of conceptual precision, we should therefore define replication, or whatever we want to call it, as a process which makes a new entity that is approximately equivalent to the old one, but not necessarily identical.

OBJECTION 7: DISTINCTION BETWEEN REPLICATOR AND INTERACTOR IS UNCLEAR

I agree with Schatzki on this point. The distinction between replicator and interactor is constructed as an analogy to the distinction between genotype and phenotype in biological evolution (Hull 1988). Consider the example of a stone axe. The axe cannot reproduce itself. What is reproduced is the recipe for how to make a stone axe. So the replicator is not the axe but the recipe. But what is the interactor? An interactor is defined as "an entity that interacts as a coherent whole with its environment in such a way that this interaction causes replication to be differential." The interactor does not have to be the producer or the product of the replicator. According to this definition, we can have several different interactors in our example: the axe, the person who uses axes and experiences which variant works best, the person who produces axes, and the act of communication between these two. If we further assume that one type of axe works best on one sort of tree, while another type of axe works best on another sort of tree, then the tree also becomes an interactor. Even this simple example leaves the definition of interactor indeterminate.

Clearly, there is room for a lot of elaboration on these concepts. We may regard the different interactors as different perspectives that might lead to different insights. Or we may regard this exercise as unimportant if we are satisfied with the simple conclusion that cultural evolution has led to improvements in axe technology.

OBJECTION 8: SOCIAL PRACTICES ARE NOT REPLICATED, BUT CONTINUED OR EXTENDED

If a social structure or practice evolves, when does the old copy end and a new replicated version begin? A social structure, which is continued or extended, cannot be divided into distinct, countable instances. Thus, the memetic theory does not apply.

I agree with Schatzki on this point, which I have also argued elsewhere (Fog 1999). Memetic theory requires distinct instances of information units to be replicated; hence memetic theory does not apply very well to the evolution of social structures and practices. But general selection theory, as defined above, does not require distinct instances. It suffices that such structures are extended differentially in time or space.

Economic competition between companies is a good example of this. If one company increases its market share because of some competitive advantage, then this company grows, but it is still the same company, not a new copy. Thus, the theories of competition in a free market economy may, in principle, be subsumed under the general selection theory, but not under memetics. The same applies to the continuation and evolution of other social and political organizations and structures.

Changes in social structures often involve feedback mechanisms. For example, we often see that big companies have a competitive advantage over small companies. This advantage allows the big company to grow bigger, which increases its advantage further and allows it to grow still bigger. Such feedback effects are quite common, not only in economic systems, but also in other social and political systems. These effects are not covered very well in the general selection theory, as defined here. In order to analyze the selecting consequences of feedback effects in detail, we may need assistance from other, more mathematically oriented, disciplines.

OBJECTION 9: THE ACTION OF MEMES REQUIRES THE SOCIAL STRUCTURE THAT THE MEMES ARE SUPPOSED TO EXPLAIN

The same paradox pertains to genetics. There are genes coding for the organic structure that interpret genes. And there are genes determining when to enact genes. We may wonder how these arose in the first place, but we have no problem explaining why they persist.

In sociocultural evolution, we have instructions, rules for interpreting instructions and for deciding when to use them, as well as the whole complex of social structure in which these rules work. These are all interacting and subject to interdependent selection processes. Schatzki (2001) makes a similar conclusion, though with a slightly different terminology.

This circularity problem is smaller in memetics than in genetics, though, because the ultimate impulse to interpret instructions is assumed to be innate. Several scientists have studied the genetic basis of culture (Rindos 1986).

OBJECTION 10: THE CULTURAL CANNOT BE SEPARATED FROM THE SOCIAL

Schatzki argues, that the replication and selection of memes is a social process, which takes place in the context of a social practice and arrangement (2001). The replication of memes is not possible without the social practice, of which they form a part, also being replicated. Hence the social practices and arrangements are the prime, though not exclusive, phenomena that reproduce and persist in sociocultural evolution, according to Schatzki.

I think it is unwise to make general statements about whether the memes or the social structure change most or persist longest. This is a matter to be determined on a case-by-case basis. Focusing on the memes or on the social structure and practice are two different perspectives which are equally valid. The memetic perspective may be the most fruitful one in situations where memes change a lot while the social structure is almost unchanged. On the other hand, the focus on the evolution of social structures and practices may be the most fruitful perspective if the most important changes take place at this level. In the latter case, the memetic perspective may appear reductionist and less productive.

Furthermore, there may be situations where significant events take place at both levels, or in the interaction between the two, so that our model has to consider the coevolution of memes and structures. However, a holistic model that is intended to cover every perspective

may soon become unmanageable. It is therefore acceptable, and perhaps also necessary, to limit the focus of attention to those areas where the most interesting phenomena happen.

The term *cultural selection* is intended to emphasize cultural inheritance or transmission, as opposed to the genetic inheritance in biological evolution. To use terms like *social evolution*, or *sociocultural evolution*, as Schatzki proposes, is of course quite valid if one wants to emphasize the social perspective.

OBJECTION 11: PEOPLE CAN INTERPRET RULES AND CHOOSE WHICH RULES TO FOLLOW

I agree with this point. Elsewhere, I have argued that memetics need to make a distinction between knowing a meme, endorsing a meme, and practicing a meme (Fog 1999). Schatzki argues that actions are organized into practices by a complex of memes: (1) a pool of understandings, (2) an array of rules, and (3) what he calls *teleoaffective structure*, defined as a spectrum of normativized and hierarchically ordered ends, projects, and tasks, to varying extents allied with normativized emotions and feelings (Schatzki 2001, 2002). Clearly, memetics and selection theory can only account for some aspects of social behavior and practices, namely those aspects that are transmitted from person to person. Other aspects, such as individual decisions and motives, need to be covered by psychology and other disciplines.

OBJECTION 12: THE IDEA OF COMPETITION PROJECTS CAPITALISM ONTO NATURE

This objection appears to be ideological, rather than scientific. The fact that competition in a free market economy is a selection process does not invalidate the theory of selection, regardless of whether we consider this competition fair or unfair. Some versions of selection theory, commonly known as social Darwinism, have been used ideologically for justifying racist, imperialist, and colonialist ideologies. I assume that it is superfluous here to argue against the validity of such a justification. As already explained, selection theory can account for both desired and undesired outcomes. The theory may be useful for determining what the result of an economic, social, or other competition is. Whether this result is desired or not, must be left to a political discussion.

Incidentally, I have to correct the misunderstanding that evolution necessarily involves competition. Schatzki assumes that selection always involves competition for a limited resource (2001). This may or may not be the case. The idea that the Earth is round has replaced the idea that the Earth is flat, because we can only accept one idea about the shape of the Earth. But the discovery of a new star or a new biological species does not have to replace any existing knowledge. Human knowledge can be cumulative, and there appears to be no limit to the amount of information we can store, as we are using technical means of information storage when the memory does not suffice. The growth of knowledge has often been seen as an evolutionary process (Hull 1988).

OBJECTION 13: IRRATIONAL BELIEFS WILL VANISH BECAUSE HUMANS PREFER TRUTH AND LOGIC

Critics often argue that human action is guided by rational decisions quite unlike the blind trial-and-error of biological evolution. Therefore, they argue, we do not need a Darwinian model to describe cultural change. However, I will maintain that humans cannot predict all consequences of their decisions. And even if they could, they might still make egoistic choices that are detrimental to their society. Therefore, we need a theory to describe the emergent societal consequences of many people's decisions.

Percival (1994) challenges the claim that humans are likely to spread irrational beliefs. He argues that humans have a strong innate preference for truth and logic and that this will guide their choice of beliefs. However, this presupposes that false beliefs can easily be disproved, and this is not always the case. True and false beliefs can spread equally fast when no proof or disproof is easily available and believers of true and false statements are equally successful. Unless dominating selective forces discriminate between true and false beliefs, cultural selection cannot tell whether a belief is true or false.

History shows that even severe logical inconsistencies in a set of beliefs can be covered up by auxiliary hypotheses (Lakatos 1974) or by the belief that *blind faith is a virtue* (Dawkins 1993, Brodie 1996). Percival argues that a set of beliefs containing logical inconsistencies will eventually collapse under the weight of a growing number of such auxiliary hypotheses, and that the "*blind faith is a virtue*" meme makes the meme complex vulnerable to mutation. What Percival ignores, however, is that there may be other selective forces at work countering these effects. An irrational belief system will continue to propagate as long as the sum of selective forces supporting it exceeds the sum of selective forces countering it. A religious sect may have effective brain washing practices that counter the effect of logical thinking or the irrational belief may confer psychological rewards upon the believer.

A further mechanism contributing to the spread of irrational beliefs has been explored by Barrett and Nyhof (2001). The human memory is not neutral. Notions that violate the laws of nature are remembered more effectively than more mundane notions. This means that stories containing non-natural and bizarre elements may be remembered and transmitted preferentially. Barrett and Nyhof propose that the high prevalence of supernatural events in folk mythology may be explained in part by this effect.

OBJECTION 14: I DON'T BELIEVE THAT DEAD THINGS CAN BE SELFISH

Various versions of this objection are often heard, though seldom seen in print. Seeing a meme as a selfish creature or a virus is of course only a metaphor, but a quite instructive one.

One example of a selfish meme is the false belief that transfer tattoos given to children sometimes contain narcotic drugs. Dave Gross has studied how this rumor has circulated through many years and spread to several countries. Other scientific disciplines cannot easily explain the origin of such a rumor, which benefits nobody, without assuming malicious intent. But Gross documents that this rumor has mutated and evolved through many years, probably without any deliberate deception (Gross n.d.).

The origin and spreading of such a rumor, which makes people worry and take unnecessary precautions, and which benefits nobody, can best be understood by using the evolution of a virus or parasite as a metaphor.

CONCLUSION

Cultural selection theory applies a perspective that is different from theories of social action in the sense that it focuses on the properties of the ideas and things that humans choose, rather than the characteristics of the persons choosing. Different perspectives make scientists focus on different aspects of a phenomenon, ask different types of questions, and consequently make different kinds of discoveries. The kind of discoveries that are made from one perspective are unlikely to be made by scientists using a different perspective, not because they do not make sense, but because the focus of attention is elsewhere. Since all perspectives are valid, the different perspectives should be regarded as supplementing each other, not as competing against each other. No perspective, theory or paradigm can claim universal generality. Every social science theory has limitations in the sense that there are phenomena which it doesn't cover or cannot explain. The remedy against such limitations is not to reject the theory, but to refine it or supplement it with other theories. Only when another theory can explain the same observations better, should a theory be rejected (Lakatos 1974).

Some of the objections that have been raised against cultural selection theory can be dismissed as merely expressing preference for one perspective over another. Other objections can be dismissed for misunderstanding the theory or for referring to obsolete versions of the theory. The remaining objections refer to limitations of the theory. These limitations should be remedied, when necessary, by refining the theory or by supplementing it with other theories. Some of the possible refinements have been mentioned here.

Another important aspect that distinguishes cultural selection theory from other social science theories is that it can account for the emergent consequences of a long series of decisions. This makes it possible to explain the origin of functional mechanisms that are not the consequence of intentional decisions and intelligent planning.

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