The Memeticist's Challenge Remains Open

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Contents

1. Introduction and Background

The history of evolutionary theory is that of competition among different theories. The same is true for abiological evolutionary theories such as memetics. According to the received view of evolution (Sterelny & Griffiths, 1999, pp. 38–43)[1], natural selection operates through population-level change over generations caused by the differential selection among individual organisms whose fitness depends

on their respective traits. Organisms compete, and leave behind different numbers of offspring depending on their fitness as determined by the pressures of their environment, and this change in the composition of a population from one generation to the next comprises evolution. The population persists even as its membership is ever changing. The gene's eye view of evolution, first introduced by G.C. Williams (1966)[2], challenges the received view. The gene's eye view of evolution claims that evolution is ultimately driven by competition among genes rather than competition among organisms, and that the important change over the generations is the composition of the gene pool rather than the group of organisms. Based on this gene-centric account of evolution, Richard Dawkins and David Hull develop a comprehensive account of evolution based on the concept of replicators, a general kind to which self-replicating entities such as genes belong. Replicators interact with the environment indirectly through their interactors, such as the organisms, which are vessels for genes coded and produced by genes this account. In a replicator-centric process of evolution, replicators are selected for based on their effect on the survivability of the interactors through which they interact with the environment. In his 1976 book The Selfish Gene, Dawkins presents three concepts that lead from one to the next:

1. Gene-centrism: the view that genes are the primary unit and the ultimate benefactors of biological evolution.
2. Replicator theory: the theory that all evolutionary processes involve replicators, these being entities that are copied, characterised by the three principles of fidelity, fecundity, and longevity.
3. The meme concept: the concept of the meme, this being a hypothetical analogue to the gene, which acts as the replicators in cultural evolution.

Dawkins' gene-centrism, which is the paradigm case of his replicator-centric view of evolution, remains a powerful tool for modelling and thinking about biological evolution. Much of biological evolution can be understood, explained and predicted using the Hull-Dawkins distinction between replicators and interactors and its corollary models. The replicator–interactor framework is a generalised model of gene-centrism and specifies the abstract mechanics of heritable variation that facilitates Darwinian processes. Regardless of the exact physical materials which make up the actual objects that act as the replicators and the interactors, evolution must take place if the abstracted mechanics of the dynamic between replicators and interactors is in place. Dawkins (1976; 1982)[3][4] argues that replicators are characterised by high copy-fidelity, longevity, and fecundity:

1. fidelity: replicators are capable of being copied with a low rate of mutation.
2. fecundity: replicators are capable of growing in number across generations.
3. longevity: replicators are stable enough for selective pressures to affect their number over time.

Genes are the paradigmatic replicators for Dawkins. As paradigm replicators, genes are the kind of entities through which all biological evolution ought to be understood. According to Dawkins, all evolutionary processes such as the survival and reproduction of organisms reduce down to their effect on the survival and replication of the genes which they carry. This gene-centric view of evolution allows Dawkins to characterise evolutionary processes in terms of genes and their environment. The environment, on the genic level, includes everything other than each particular variant of a gene: from their allelic competitors, to the organism acting as its interactor, to the habitat in which the organism lives. Replicators are substrate-neutral: there is no reason for them to be made up of either bit or it, in principle, and they can be anything from ideas to mundane objects like marbles in a bag whose frequency is altered over time according to some pressure. Provided they share the three essential traits listed above, the Dawkinsian can extrapolate the idea onto other contexts than biological evolution. Dawkinsian memetics is the application of replicator-centric evolutionary theory to cultural evolution. To the Dawkinsian memeticist, a meme is a cultural analogue to the gene because it is a cultural replicator. It is the unit of selection in cultural evolution; its ultimate beneficiary; and the most, if not the only, important entity in the analysis of culture. Dawkinsian memetics is the application of Dawkinsian theory of biological evolution to cultural evolution.

The important point for Dawkins is that the evolutionary process characterised in this way designates the replicator as the ultimate beneficiary of adaptation. Genes are selfish because their competition and selection leads to adaptations which improve the fitness of the genes themselves, as determined by their effect on the traits of the interactors. Biological evolution can be fully described in terms of the genes without recourse to higher level descriptions of organisms or groups.

Dawkins takes pains to emphasise that the replicator-centric process of evolution is, in principle, neutral as to its medium. There is no reason that evolution must be based on DNA, for instance. He presents a famous hypothesis to illustrate his point: there might be gene-analogues in people’s minds, called memes, which act as the replicators of cultural evolution and facilitate the Darwinian process. The concept was taken up with great enthusiasm by several thinkers and developed into a school of thought

in cultural evolution, culminating in a conference on memes at King's College (Aunger, 1999)[5] which brought together researchers such as Dawkins, Dennett, Hull, Boyd, Sperber and many others, which led to the landmark anthology, Darwinizing Culture (2000)[6].

A mere five years after, Edmonds published the final issue of the Journal of Memetics which included his article concluding that 'the closer work has been to the core of memetics, the less successful it has been. The central core, the meme-gene analogy, has not been a wellspring of models and studies which have provided "explanatory leverage" upon observed phenomena. Rather, it has been a short-lived fad whose effect has been to obscure more than it has been to enlighten […] memetics, as an identifiable discipline, will not be widely missed' (2005)[7]. Edmonds, with many others, had concluded that memetics failed to meet the minimum requirements to justify its survival as he outlined in his 2002 article, 'Three Challenges to the Survival of Memetics'. Harms (2004)[8] goes a step further and argues that the correct response to the memeticist's challenge, of finding the appropriate cases and justifying the theoretical framework, should be altogether abandoned.

The challenge put forth by Edmonds (2002)[9] is to find: 'a conclusive case-study; a theory for when memetic models are appropriate; and a simulation of the emergence of a memetic process.' Many variously satisfactory accounts of memetic entities have been presented, in fields such as linguistics (Ritt, 2004)[10] and ornithology (Lynch et al., 1989; Lynch & Baker, 1993; Lynch & Baker, 1994)[11][12][13]. Birdsong in particular stand as the most well-received real life examples of Dawkinsian memes. Whether specific examples like birdsongs have vindicated memetics as a whole in any way is questionable. More likely is that the theory has remained popular because the inherent force of the conceptual model the gene-meme analogy provides has been consistently useful at a middling level for most people who make any use of it at all.

Harms (2004)[8] mounts an attack on Dawkinsian memetics and its variants from the perspective of an anti-Dawkinsian philosopher of biology rather than as a fellow memeticist. His challenge for memetics can be summarised as follows: 1. Justify the replicator–interactor framework of evolution; 2. Justify the meme's eye view framework of cultural evolution. Harms' challenge is much more daunting than Edmonds' challenge, given that it is an attack on the fundamental premises of memetics rather than merely its likelihood of success as a research programme. It is also the more important from both a philosophical point of view and a scientific point of view. In order to justify memetics at all, practically or otherwise, Harms' challenge must be overcome.

Despite what can only be called a disintegration of the field during the 2000s, a minority of researchers have continued to develop and apply memetics to the study of various culturally evolutionary phenomena. A particularly promising candidate for a paradigm case of memes is the Internet meme. Memeologists, researchers inspired by Dawkins' meme concept, have applied Dawkinsian memetics to the study of the Internet. As Shifman (2013)[14] argues, Internet memes are the ideal objects of study for a memeticist. In this thesis, I argue that this remains to be the case even if Shifman's Dawkinsian ontology of memes is abandoned. The abandonment of Dawkinsianism is precisely what I argue for, as this opens the door to any number of alternative theories about the ontology of memes that can be selected based on their fit with the results of empirical research. Ontological commitments of the sort, I argue, must be postponed in favour of a temporary agnosticism until empirical research justifies them.

2. An Anti-Dawkinsian Memetics Is Possible

2.1. Facing the memeticist's challenge head-on

Despite Edmonds' challenge consisting largely of a call to find suitable examples of memes in the wild, there has never been a scarcity of phenomena that seem memetic at first glance. If the theory is understood on loose enough terms, virtually anything that changes over time can be described as evolving. The same is true with memetics, in that any cultural change can be described to sound as if there is some kind of evolutionary mechanism underlying the process of change over time. This ease of identifying vague examples mask the difficulty of identifying specific examples designated according to strict criteria, hence the long-standing call for definitive examples of memes. Some enduringly strong candidates were identified fairly early on, such as computer viruses, which Dawkins cites as paradigmatic example of memes in his The Blind Watchmaker (1986)[15]. The issue has been that, despite the many candidate model organisms identified by memeticists, few empirical research projects were developed around any of them. The most successful application of memetics to particular observables is in animal memes, namely birdsong (Lynch et al., 1989; Lynch, 1996)[11][16]. Birdsongs are in fact exceptionally well-suited for the Dawkinsian memetics framework (Reader & Laland, 1999) [17] which is why empirical research on birdsong continues to mention memes (Pang-Ching et al, 2018; Sebastian-Gonzales & Hart, 2017)[18][19]. Insofar as Edmonds' challenge was to find suitable cases to apply Dawkinsian memetics to, it was answered before the challenge was even put. Given that the motivation for the challenge was desperation in the face of memetics' continued failure to establish an empirical research programme with sizeable traction despite the popularity of the meme concept in

general, this may not even have been possible until the development of Internet memes. The memeticists' ambition is to develop a general theory of cultural evolution that does not merely apply to exceptional cases like birdsongs. The third part of Edmonds' challenge, which is to construct a 'natural' and 'believable' simulation of memetic entities that might occur organically, can be ignored for our purposes. With well-documented and familiar examples, there is no need to rely on simulations in order to justify theories involving entities of the same kind as such examples. Even so, the fact that Internet memes occupy a uniquely artificial niche in which most communication is mediated by such unnatural means as computers renders this part of the challenge strangely outdated. As if that were not enough, Dawkins also developed a simple computer program called 'Biomorphs' which allowed users to 'evolve' a lineage of artificial organisms by selecting one of nine randomised mutations to pass onto the subsequent generation. As these two examples make clear, it is well within the realms of possibility to create entities that conform to particular definitions of the meme. Various social and technological practices have been developed deliberately within a memetics framework, such as memetic algorithms (Neri & Cotta, 2012)[20]. Aside from programmed instances of memes such as memetic algorithms, virtually all digital communication could be construed as replication processes as defined by Aunger's four requirements for replication: causation, similarity, information transfer, duplication (2002, p. 73) [21].

2.2. Pluralism Incorporating Some of Dawkinsian Memetics

Based on his theory of memetic replication, Aunger concludes that memes must be neural states within brains. Wilkins (2005)[22] criticises Aunger's 'neuro-memetics' as a failed attempt to evade the conclusion that memes are forms in the sense of being ideas: Aunger cannot bridge the gap between the physical and the semantic: given that two minds having the same mental content does not entail that the corresponding brains will have the same neural states, it cannot be assumed that having the same memes means having the same neural states. The identity between any two copies of the same meme cannot be determined by their physical form or even their function (ibid., pp. 593–594).

> *"What we chiefly need here is a Cultural Darwinian Theory, not a memetics, which transports to culture the gene-centrism of a particular kind of restricted neo-Darwinism […] It is not that there are no replicators in culture, but rather that there is no single kind of replicator, and moreover that not all cultural evolution requires replication in order to proceed. Identification of memes relies on an acquaintance with the context in which memes are transmitted (the memetic Stewart Test), and if that*

> *is the case then a neural reduction of memes is unnecessary. Memes are whatever we see transmitted."*

(ibid., p. 595.)

Wilkins' pragmatic alternative to Dawkins' ontology-first approach to memetics and cultural evolution leads him to a pluralist position that reduces the focus on memes and relegates it to a position of one replicator among many. The absolute primacy of the replicator as the unit of natural selection is an essential trait of Dawkinsianism, and any theory which takes on such an egalitarian view towards the entities involved in evolution cannot be said to be Dawkinsian. According to a pragmatic pluralist such as Wilkins, the utility of memetics is not in its ability to specify an evolutionary ontology which lays out the necessary and sufficient conditions for Darwinian processes, but rather as a component of a more complex explanatory framework. Sterelny (2006)[23] suggests memes have a place among other inheritance systems and need not compete for a privileged position above other cultural evolutionary systems. Similarly, Henrich and Boyd (2002)[24] show that multi-attractor systems sufficiently resemble that of replicator dynamics (Henrich, Richerson & Boyd, 2008, p. 122)[25] such that non-Dawkinsian frameworks may retain the advantages of replicator-centric theories.

The rare few instances in which researchers preferentially selected memetics as the framework on primarily practical grounds involved real examples which were readily characterised as instances of Dawkinsian memes. Namely, they involved some obvious process of high-fidelity copying of entities intuitively recognised as discrete. The debate in memetics has focused primarily on whether cultural evolution is the result of such discrete, self-replicating entities and whether these case studies can be generalised across all of culture. Sperber (in Aunger, 2000)[26] for instance criticises the idea that cultural evolution, if trends in cultural change is evolutionary, is a Darwinian process. He presents a case for what he calls 'attractors', to which cause mental states and attitudes to converge within a population. Attractors do not form lineages via sequential copying in the same way that replicators do, and in fact no copying as such need be involved in the form of an original-copy relation. Therefore, attractor theory is a potential replacement for memetics as a theory of cultural evolution.

Dawkinsians argue for a replicator-centric view of cultural evolution primarily because all other options are deemed impossible, on the grounds of the necessity of replicators for any Darwinian process of evolution. If evolution need not be Darwinian, or if replicators are not necessary for evolution,

Dawkinsians are left without grounds to argue for memetics as any more plausible than other logically possible ways in which an evolutionary process may occur. Unless cultural evolution must necessarily be memetic, because evolution must necessarily involve replicator dynamics, the debate about how culture evolves or whether memes are real entities can only be resolved empirically.

Dennett's own interpretation of Dawkinsian memetics is ultimately quite similar to Wilkins' pluralism, despite Dennett's heavy reliance on Dawkins for his theory of memes. This is so because the paradigm meme for Dennett are words. Harms (2004, p. 46)[8] argues that Dennett's intentional stance, his strategy of attributing apparent intention to entities as an explanatory heuristic, allows him to make claims about the identity of cultural items without relying on physical, structural, commonalities. Harms highlights this pragmatic reliance on subjective judgment of the kind recommended by Wilkins as a critical flaw in Dennett's theory. Harms argues that reliance on the intentional stance allows Dennett to make unfounded identity claims about memes without any basis on even a theoretically uniform standard by which to judge the similarity of cultural items (ibid., p. 50)[8].

2.3. Rejecting the Memeticist's Challenge

William F. Harms, in his Information & Meaning in Evolutionary Processes (2004)[8], argues that the memeticist's challenge should be rejected altogether in favour of another theory of cultural evolution. Compared to the pluralists, Harms presents a far less eclectic response to Dawkinsianism. Not only does Harms reject memetics as an ontology, he also rejects the heuristic value of the meme's eye view as espoused by Blackmore (1999)[27]. Harms paints a picture of memetics as a dead-end discipline whose potential has been explored and shown to be depleted. According to Harms, the concept of cultural evolution based on replicators attracted academic attention and gave rise to three groups of literature in memetics (pg. 65 in Information and Meaning in Evolutionary Processes)[8]:

1. Attempts to use the notion of selfish replicators as an explanatory framework for culture.
2. 'Essentially quantitative studies of cultural transmission patterns, which make little or no assumptions about the underlying tendencies of imitated entities to evolve for their own transmitability'.
3. Theoretical, definitional, metaphysical debates about the concept of memes and memetics.

Harms' categorisation of memeticists suggests that memetics had already achieved a healthy balance of explanatory, empirical and philosophical research by the mid 2000's. However, memetics lacked the quantitative dimension which Harms' second group of memeticists suggests. Five of the ten researchers who, according to Harms, 'seem to find "memetics" to be a timely label for an established and respected approach to the study of cultural evolution and transmission' (2004, p. 65)[8] in fact either ignore or explicitly reject the label of 'memeticist'. Sperber has been a vocal critic of memetics, particularly the Dennettian strain (Sperber, 2000; Claidière, 2014)[26][28], while Richerson and Boyd, and Cavalli-Sforza and Feldman (1981)[29] are anti-Dawkinsian cultural evolutionists (see Henrich, Richerson & Boyd, 2008)[25] whom Wilkins cites as examples of non-memetic Cultural Darwinists (Wilkins, 2005, p. 595)[22].

Harms does make an accurate appraisal of the general trend in memetics towards eschewing ontological commitments and restricting the use of memetics as a conceptual metaphor, merely a 'productive way of looking at cultural processes' (Harms, 2004. Pg. 66)[8]. Following Blackmore's popular The Meme Machine (1999) and the endorsement in its foreword by Dawkins, meme researchers have used the highly simplistic definitions provided by Blackmore to bypass the convoluted debates around the subject matter altogether. This drift toward the heuristical usage of memetics as a conceptual metaphor, quite unlike the gene-centric theory of evolution in the degree of specificity and materiality claimed and pursued, coincided with the growing popularity of the meme concept outside of the academia (Burman, 2012)[30]. Harms' relatively minor criticism of memetics, which is that it has been exhausted from every angle, is unfounded.

Whereas Harms' broad attack on the status of memetics as a science is easily dismissed as premature, his ontological criticisms of Dawkinsianism deal a critical blow to Dawkinsian memetics. His criticism of Dawkinsian memetics is two-pronged: on the one hand, Harms attacks the strong theory of Dawkinsian memes as represented by Dennett; on the other hand, Harms attacks the weak theory of Dawkinsian memes, or the meme's eye view, as represented by Blackmore.

One extremely demanding criticism that can be made against Dawkinsian memetics is that it must update its definition of the meme based on the updated definition of the gene. The practical implications of this requirement are very costly, since it would imply that any future updates in genetics has to be reflected in memetics also. One way to get around this problem is to transition from the analogical stage of the theory to an empirical one, through the identification of the paradigmatic meme that can totally

make reliance on approximately equivalent entities. Once memes can be studied directly, they would not need to be studied indirectly through genes. Like many critics of Dawkinsianism, Harms takes issue with the prioritisation of replicators as the fundamental unit of evolutionary processes. Unlike most anti-Dawkinsians, Harms starts from a radically materialist perspective and posits that the cell ought to be considered the basic unit of life rather than the gene (2004, p. 56). The move to base the ontology of evolution and life on a different paradigmatic case as the gene sets Harms' theory of evolution on similar footing as the developmental systems theorists. As Harms puts it, it 'would at least constitute a recognition of what developmental biology has learned' (ibid., p. 57).

Other alternatives to Dawkinsianism make a similar case against both the gene-centric view of biological evolution and the meme-centric view of cultural evolution. One example of a potential point of attack for Dawkinsian replicators is about their three essential traits of fidelity, fecundity, longevity. There are many cases of evolutionary processes which do not depend on fidelity, for instance. Henrich and Boyd (2002)[24] show that evolution can happen even in extreme cases where mutation occurs in every single instance of copying, and that replication, fidelity or longevity are not necessary for evolution (Henrich, Richerson & Boyd, 2008, p. 123)[25]. Blackmore (2000)[31] counts the immune system among her examples of evolutionary processes, despite the fact that the immune system is dependent on inducing very high levels of mutation in order to be effective at all.

Harms does concede that weak Dawkinsianism, which merely adopts the replicator-centric framework as a heuristic for understanding evolution, cannot be defeated so cleanly as strong Dawkinsianism, since it lacks ontological commitments that can be knocked down by pointing out the inconsistencies between the model and reality. After all, '[h]ow does one go about assessing a "point of view?"' (2004, p. 67). Harms' response is that it ultimately comes down to the usefulness of the point of view. As for the usefulness of the meme's eye view, Harms predicts that:

> *"even if we can figure out how to make objective identifications of Dawkins' replicators, there probably won't be enough of them for an interesting account of cultural evolution… For the purposes of an evolutionary epistemology, or, say, a theory of consciousness, one needs a way of analyzing the way thought and communication occur in general over time."*

(Harms, 2004, p. 42)[8]

3. Internet Memes are the Ideal Paradigm Cases for Anti-Dawkinsian Memetics

As I have shown in the previous chapter, every argument based on the notion that evolution necessarily requires replicators is based on a false premise. Importantly, this does not entail that cultural evolution cannot be analogous to biological evolution, in the strong sense of involving the same kinds of entities, relationships and processes. Given that such entities can be artificially programmed, this is trivial. At least some cultural entities evolve, and at least a subset of these evolving cultural entities evolve through a Darwinian process. Despite Edmonds' ambitious challenge to produce 'natural' simulations of memes, any simulation of memetic processes proves that memetic evolution is possible in principle. Furthermore, what is considered natural has changed so much in the past few decades that the clause is meaningless. Memetics seems so modern in many ways, particularly given the growing relevance of the theory for Internet research, and it is easy to forget how old it is. 1976 was over 40 years ago, as is any science that Dawkins based his conjectures and musings on at the time of writing. Dawkins initially presumed that harmful code in computers would infrequently arise due to mutations (Dawkins, 2006, p. 329)[32], and had to later correct himself as the deliberate production of computer viruses became more common.

The memeticist's challenge remains open in a modified form. The most plausible case against the utility of memetics is Harms' argument that no scientifically interesting cases of memes are likely to exist in abundance. The challenge is to find scientifically interesting cases of what may be pragmatically characterised as memes in the sense argued for by Wilkins, and construct a new theory of memes based on the paradigm case as Harms constructs his ontology of evolution using cells as his base case. This challenge must be answered simultaneously with a coherent ontology of memes and with a body of empirical evidence that supports it. A satisfactorily interesting case of memes must be recognisable as memes by those familiar with both memes and memetic contexts, and above all be useful to consider as the paradigm case in the first place. The definition of a meme in this new theory of memes must not emerge from a preconceived set of restrictions such as those presented by Dawkins or Lewontin in their characterisation of the units of selection (Okasha, 2006, pp. 13–23)[33] but from a gradual modification of concepts. This new theory of memes would readily draw upon lessons from up-to-date philosophy of biology and evolutionary theory, and the empirical study of paradigmatic entities, namely Internet memes.

The starting point for this new theory of memes must be a commonsense notion of Internet memes, which are incontrovertibly existent entities regardless of their ontological status. They may turn out to be evolutionary individuals or groups, lineages or replicators, or a system of ontologically various entities not independent of one another. The minimum requirement An important case for this purpose is folkmemetics, or the popular understanding of memes outside of academic and research contexts, analogous to folkbiology. For the most part, the colloquial use of the term ‘meme’ to denote online content does not imply any consideration about the broader debate about cultural evolution. Instead, the debates in folkmemetics narrowly concern the cultural artefacts shared online, which are plainly visible to the users who participate in the attendant subcultures. This immediate observability of Internet memes is an extremely important feature as it allows any pragmatically minded researcher to largely bypass the ontological challenges associated with memes per se: Internet memes incontrovertibly exist and can be studied empirically. They provide the fundamental unit, much like cells do in Harms’ ontology of evolution.

It is out of the scope of this thesis to present a fully fledged theory of what the new theory of memes will look like, but it is already clear that a new theory of memes could begin from the study of Internet memes in a folk-memetically recognisable sense and develop towards a more concrete ontology. The new memetics would be a framework for explaining and understanding what sort of cultural evolutionary processes are involved in the spread and development of these cultural artefacts called memes. Limor Shifman’s ‘web memetics’ approach (2009)[34] comes closest to this approach and adequately represents memeology (2015)[35] as a self-consciously distinct subdiscipline. Shifman applies Dawkinsian memetics to Internet memes, and argues that ‘the meme is the best concept to encapsulate some of the most fundamental aspects of the Internet’, as they exemplify very high copy-fidelity, fecundity and longevity (2013, 17–24)[14].

Shifman is an orthodox Dawkinsian but distances herself from what she sees as the two major controversies and failings of Dawkinsianism, which she generalises across memetics as a whole:

1. ‘biological analogies’: Shifman attributes the failure of memetics to the overzealous application of biological analogies to culture, and claims that culture is simply nothing like biology, and that cultural evolution is nothing like biological evolution.
2. ‘who’s the boss’: Shifman argues that classical memetics downplays human agency to an unacceptable degree and puts forth an overly deterministic picture of cultural evolution in which

> people are portrayed as mere vehicles controlled by memes, and that this meme-centred view of culture undermines its analytical power.

(Shifman, 2013, pp. 11–12)[14]

In particular, Shifman is adamant about the importance of ‘agency’ and the restriction of ‘biologisation’. Not only are memes too different from genes for most gene–meme analogies to hold, ‘[t]he ideas of replication, adaptation, and fitness to a certain environment can be analyzed from a purely sociocultural perspective’ (ibid., pp. 11–12). As Harms puts it more strongly, ‘[y]ou can account for everything that memes are supposed to do in terms of things that human beings do. The converse does not hold.’ (2004, p. 77)[8]. Shifman’s point is trivial without an additional clause such as with Harms’ point that the explanatory pathways are asymmetrical. That the evolutionary dynamics traditionally explained on the level of groups or organisms can also be explained through genes is the starting point for Dawkins, and the inverse, which is that genic selection can be explained without explicit reference to genes, is totally congruent with Dawkinsianism. Shifman’s liberal usage of biological terminology all throughout her 2013 book makes it even more clear that her case is against a certain degree of extrapolation from the gene–meme analogy rather than the meme’s eye view or Dawkins’ theory of replicator-centred evolution.

Shifman adds an unexpected twist to the Dawkinsianism on which her theory of memes is based: she argues that ‘internet memes [are] families of texts that share a similar quiddity. Yet each meme family also shares content and form characteristics with other meme families. Together they are organized into larger networks, shaping the digital culture at large.’ (Segev et al., 2015)[36] ‘Quiddity’ here means essence, a concept which Dawkins claims should be retired in its entirety (2014)[37]. Thus, Shifman is committed to a peculiar position that is Dawkinsian in its characterisation of memes as components of an evolutionary and replicatory dynamic, but essentialist in its characterisation of memes as independent entities. The contradictory strand in her ontology arises out of the inevitable need for Shifman to identify memes as tangible entities independently of the cultural evolutionary processes in which they are involved.

In order to justify her essentialism, Shifman selects paradigmatic cases of memes to infer their quiddities by examining commonalities among them which sets the correlated families apart from other families. Her selection criteria for these paradigm cases are oddly arbitrary. They are: 1. Popularity among

Internet meme researchers; 2. Nomination by Know Your Meme, a major meme aggregator and folkmemetic research platform whose content is editorialised forum contributions from their users (Shifman, 2015)[35]. She identifies morphological categories based on responses from ‘coders’ who browsed the selected samples of memes, and relates them to her three ‘memetic dimensions’, which are:

1. Content: The idea/s and the ideology/ies conveyed by a specific text.
2. Form: The physical formulation of the message, perceived through our senses
3. Stance: Information about the communicative positioning of the addresser in relation to the text/message, the context, and other potential speakers.

(Shifman, 2013)[14]

These memetic dimensions are morphological categories and the appraisal of memetic-dimensional membership of any given memetic artefact is up to the subjective judgment of the researcher regarding similarity. The attitude is peculiarly pre-Darwinian considering Shifman’s heavy reliance on evolutionary analogies, and leads her to develop an explicitly essentialistic theory of memes based on perceived similarities (Shifman, 2015)[35]. Combined with Shifman’s requirement that memes become memes by way of being created and having already spread in a particular way (2013)[14], the ‘quiddity’ definition of memes cannot account for memes related by lineage rather than function or morphology. Shifmanian memes must either resemble one another or be functionally related by way of common usage or common recognition from users. The same image file becomes a meme by being replicated or reproduced in a way that makes them related in some socially relevant way, such as having family resemblance or meaning. A given piece of content is a meme depending on the social context. A genic analogue to this definition of memes would be that a piece of DNA is only a gene if it spreads. There is no contradiction to this definition in and of itself, but it renders all claims about memes from Shifman a claim about the social attitudes of users towards the family of content within a historical context. Shifman’s memes cannot be characterised in terms of the past, as any product of evolution must be. They can only be characterised in terms of the social attitudes sorting them into various groups at the time. Therefore, Shifman’s essentialism is irreconcilable with an evolutionary perspective. Yet Shifman’s quantitative research treats memetic content as if they can be characterised as entities with a stable identity across time. This is reflected in one way by the fact that she treats visually identical artefacts as

interchangeable, rather than taking its historical properties seriously: the same image can often have been created at a different point in time. This is necessarily true for any entity that spreads.

Shifman's contradictory characterisation of memes is partly a product of her mischaracterisation of the history and possible scope of memetics. Historically, memeticists outside of biology and the philosophy of biology have all tended to accept Dawkins' theory of biological evolution and focused most of their attention on reforming memetics by clarifying the theory, starting from Dawkins' vague definition of the meme. This is as much an effect of the popularity of the Dawkinsian paradigm in evolutionary biology, which divides all evolution into replicators and their environments, as it is an effect of the apparent inseparability of memetics from the Dawkinsian paradigm. All classical memeticists commit to the notion that evolution involves a replicator-interactor dynamic of some sort, and diverge the most when it comes to the issue of what should count as memes. Much debate during the first several decades of memetics was dedicated to attempts at identifying examples of memes, and Shifman picks up the debate from this point in history. She argues that Internet memes are paradigmatic examples of the Dawkinsian meme, whose fidelity, fecundity and longevity are heightened thanks to the Internet and defines memes as 'pieces of cultural information that passes along from person to person, but gradually scales into a shared social phenomenon' (ibid.) and that 'micro–macro propagation, replication through imitation, and selective competition—are strongly manifest in digital environments.' (p. 23).

According to Shifman's classification, memetics historically falls into one of three traditions: mentalism, which considers memes to be ideas; behaviourism, which considers memes to be behaviours and behavioural artefacts; and inclusionism, which allows for memes as ideas as well as behaviours and artefacts (ibid.). Shifman's haphazard memetic ontology allows her to arbitrarily characterise memes based on intuitive notions of relation and essences. This serves her purposes in making loose generalisations about social trends in light of memetic trends over an implicit period of time, but the debt of ontological contradictions cannot be resolved through more research of this sort. Consequently, Shifman has developed a methodology of deferring the decisions of what counts as the 'same' meme to ordinary content producers whose primary distinguishing trait is the fact that the content they produce is commonly recognised as memes (2018)[38]. The primary benefit of this pragmatic methodology is that there is no need to define what a meme is in order to study it somehow. The systematic and essentialistic nature of the ontological sloppiness means that her theories consistently fare worse than had she simply taken up Wilkins' suggestion to use an 'I know it when I see it' test (2005)[22] and left the matter of identifying memes at that. There are ways to construct such a pragmatic methodology without ensuring

that the underlying ontology becomes increasingly byzantine over time. Namely, to commit to empirical research without preempting its consequences on the ontology.

Other researchers have taken the opposite approach to memeologists includes David Hull, who called for “crude empirical investigations” (in Aunger, 2000)[39] as an antidote against conceptual and definitional disputes that hamper progress towards at least a usable standard of research for memetics. Quantitative researchers studying memes today continue this mission. These quantitative researchers produce work that falls into the second group of memetics literature as classified by Harms (2004)[8], but virtually never adopt the label of ‘memeticist’ and share few ontological commitments with memeticists. The meme concept provides merely a workable definition of some observable phenomenon which can then be studied empirically without further theoretical concern. The benefit of this approach is obvious, which is that empirical research can happen unrestricted by particular theoretical requirements, which in turn will contribute toward a likewise unrestricted number of theoretical models of cultural evolution. However, since current empirical research is not aimed at reassessing memetics or promoting theoretical developments per se, the responsibility to derive theoretical lessons in light of new developments and discoveries lies with the theoreticians and philosophers. Compared to Shifman’s implicitly ontology-first theory, this approach can be said to be neutral. Meme theory must be reassessed in light of the new developments in this strand of memetics.

The fact that memes can be explained in terms of social, cultural and psychological events is not a problem for memetics either. For example, Weng et al. (2012) use topic label tags on social media posts (namely, hashtags on Twitter) as ‘operational proxies to identify memes’ that spread through the Internet from user to user.

> *“at the statistical level it is not necessary to invoke external explanations for the observed global dynamics of memes. This appears as an arresting conclusion that makes information epidemics quite different from the basic modeling and conceptual framework of biological epidemics. While the intrinsic features of viruses and their adaptation to hosts are extremely relevant in determining the winning strains, in the information world the limited time and attention of human behavior are sufficient to generate a complex information landscape and define a wide range of different meme spreading patterns.”*

(Weng et al., 2012)[40]

The definition of the meme is elaborated no further than a terse mention of memes as the equivalent of an idea. Based on this working definition of the meme and assuming that ‘a retweet carries a meme from user to user’ which may be tracked by the hashtags used, they construct a network model of memes competing for limited attention in a network of users, and find that ‘a simple model of competition on a social network, without any further assumptions about meme merit, user interests, or explicit exogenous factors, can account for the massive heterogeneity in meme popularity and persistence.’

The problem of how best to study Internet memes and the dilemma faced by memeticists given the breakdown of analogical inference from Dawkinsian evolutionary theory can both be solved through prioritising such empirical study before attempting to build up the ontology based on unspecified degrees of analogical reasoning. The mere reordering of ontological work and empirical work resolves issues such as those faced by Shifman, which is to identify what memes are before studying them. On the one hand, memetics requires empirical evidence on which to base its ontological speculations. On the other hand, memetics is a time-proven framework for the intuitive understanding of entities like Internet memes, as the overwhelming popularity of the idea makes clear.

Memes are trivially easy to identify if we take away the ambition to develop an unchangeable and highly reliable definition. Internet memes are cultural content online that are usually generated and spread by human users, often for their emotive content such as humour and sociopolitical resonance. The colloquial use of the term ‘meme’ to refer to such content began as a direct allusion to Dawkins’ original meaning of the term. The most recognisable form of an Internet meme is a funny image that has been shared around many times between many users through social media. There are many exceptions to this informal definition, which can be readily captured through a more sophisticated ontology. The colloquial notion of memes has eclipsed the original meaning, but it is popularly acknowledged that Internet memes are an unusually well recognised subset of memes, including by Dawkins (in Solon, 2013)[41].

Rejecting the baggage of ontology-first research into memes opens up new doors for meme studies, namely alternative theories from the philosophy of biology to draw on for cultural evolutionary frameworks. The identification and selection of the paradigmatic research object need not depend on Dawkinsian analogies, but they do need to be based on the minimum requirements for a theory of memes. Dawkins argued that memes are cultural replicators because they are analogous to genes: (a) genes are the units of selection in biological evolution; (b) entities analogous to genes must be replicators; (c) memes are analogous to genes; and therefore, memes are cultural replicators and the

units of selection in cultural evolution. Yet it is possible to hold some kind of a mid-ground position in which some meme-gene analogy can be assumed without supposing there to be discrete cultural units. If a meme-gene analogy is retained without Dawkinsian genetics, then there is no reason for memes to be Dawkinsian, either.

Memetics can back out from the dead end of Dawkinsianism and adopt a new strategy that puts empirical research first. In order for the new strategy to succeed, the philosophy of memes must defer to the science of memes in the same way that the philosophy of biology must defer to the science of biology in many respects. This is particularly so in the ontology of memes, in which four decades of attempting to reason out the nature of memes based on ontological proxies in another substrate, failed to achieve significant headway aside from the popularisation of the theory itself. Regardless of the fitness of the meme concept as a meme itself, its success as a theory must be measured by how well it can explain actual phenomena and how well it supports further research. But if (i) Internet memes are the most promising candidate for a paradigm case of memes; (ii) empirical research of Internet memes is growing and developing with little to no important input from meme theorists; and (iii) the philosophy of memes most crucially depends on the accumulation of empirical research, what is there left for the ontologists to do but wait for the results to interpret? One answer is that there already exists a tremendous amount of results to interpret. Namely, the results of the past four decades' worth of philosophy of biology, from which ontological lessons can be taken and transplanted into the philosophy of memes. A sound ontology is the virtually guaranteed reward of such a disciplined methodology applied over an extended period of time.

One promising approach is the application of developmental systems theory to memetics. We can call it memetic systems theory since the focus is on memeticity rather than development, although there is no reason in principle that they may not be the same thing. Since the new theory of memetics can be free from the metaphysical requirements of being a theory about replicators, and only requires that they are evolutionary entities in some useful sense, other theories of evolution such as developmental systems theory can be readily applied without compromising the integrity of the theory. Applying DST to memetics has interesting effects on the ontology of memes, such as the following:

1. Memes are no longer uniquely important units of cultural evolution
2. Memes are no longer self-replicating units of culture

3. Memes are no longer discrete units of culture
4. Memes are no longer privileged causes of cultural evolution

Memes retain to whatever degree is plausible their importance as part of the cultural evolutionary process, but the pressure to prove that they are the ultimate causes and beneficiaries of cultural evolution is lifted thanks to their demotion to the same level of importance as any other part of cultural evolution. The theory is neither deterministic nor meme-centric in the ways that Shifman finds other memetics theories objectionable, without any of the contradictions pointed out earlier about Shifman's own theory. If there is one commonality among all of the theorists studying Internet memes, it is that the context of the content matters. Memetic systems theory provides a powerful framework for the analysis of evolutionary cultural entities without even the hint of determinism and essentialism that Dawkinsians struggled to exorcise from their own following of the 'selfish' gene. This alone provides a strong counterargument to Harm's case that the meme's eye view will not offer an interesting enough insight into cultural evolution to be justified over other ontologies.

4. Conclusion

The etymological origin of the meme is commonly invoked as an intellectual curiosity in pop culture, or as a perfunctory stepping stone for researchers to define their own positions against. Dawkins' 1976 definition of the meme is the standard starting point for most talk about memes in any field outside of biology and philosophy of biology. For most practical purposes, which are mostly not scientific purposes, this perfunctory reference to the origins of the term and its attendant conceptual framework is sufficient. Most readers have a general idea of what a gene is supposed to be, and the notion of a gene-analogue in culture is grippingly intuitive. Similarly, empirical researchers often make use of the meme as a loose term that stands in for the research object whose nature must be further elucidated through the very same research based on the concept. There is no need for an empirical researcher to go any further than demonstrate the conceptual framework through which their research and findings are intended to be understood. The ontological status of the gene is largely irrelevant to the lab researcher. Most pragmatically-minded empirical research involving entities fruitfully characterised as meme-like, either metaphorically or literally, does not go much further than the initial workable definition offered by Dawkinsian memetics. They do not need to concern themselves with the philosophy of memes in any serious way to produce findings with profound implications on the philosophy of memes.

During the height of research interest in memetics, Hull (in Aunger, 2000)[39] urged memeticists to focus on crude empirical research in order to cut through the irresolvable ontological debates and make headway in the study of memes, whatever they may turn out to be. Despite the extremely prescient recommendation from Hull, memeticists failed to develop memetics into an empirical discipline. Hull himself did not contribute very much at all in terms of empirical work, but his meta-theoretical contributions about the development of science in general and his guiding criticisms about memetics remain essential. It is hardly too late to follow Hull's suggestion to put empirical research first. No matter how tantalising the possibilities of frameworks like memetic systems theory may be, they cannot be given priority over the tedious work of collecting, sorting and analysing information about memes in the real world. Theories and ideas, like Dawkins' genes, can live forever, but things in the real world often die out before they can be studied. Ontology can wait.

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