

**Evaluating the meme concept : the case for a cultural
optimon**

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Title: Evaluating the Meme Concept: The Case for a Cultural Optimon

Short Running Title: Evaluating the Meme Concept

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Abstract

This article describes an empirically based evaluation of the meme concept. Memes are the potential ‘engines’ of evolutionary processes in organisations. However, a lack of consensus in meme theory frustrates its application and the operationalisation of the concept in empirical memetic studies. This study adopts the first extra-memetic empirical method that has been applied to the discipline.

To orientate the study, the optimon definition of a replicator is highlighted as vital to a critical evaluation of memes. To adopt the optimon concept, a two-step narrative method is applied. First, written accounts of competing cultural strategies are constructed. Second, the strategies are analysed to reveal points of competition which can be defined in relation to each other. One such optimon unit is discussed in light of meme theory. The findings support the possibility of unitary culture but do not support the notion of selfish replication in culture.

Keywords:

Narratives

Memos

Memetics

Cultural Optimon

Punnett Square

Introduction

In this article, I present the findings of an empirical evaluation of the meme concept. Memes, which are analogical to genes in biology, were first proposed by Dawkins (1976; 1982; 1989; 1999) as units of culture which self-replicate. Subsequently developed fundamental meme theories have offered a range of potential solutions to the complexity of human culture (Aunger, 2002; Blackmore, 1999; 2000; Brodie, 1996; 2009; Dennett, 1991; 1996; 2003; 2006; Distin, 2005; Lynch, 1996). However, although the meme concept has been developed by a number of scholars, there has been little complementary empirical research which might help to validate the various meme theories, especially in relation to organisations and management (Gill, 2012). Consequently, there is a degree of heterogeneity in meme theory which necessitates evaluative empirical research.

To make my evaluation, I first situate memes in terms of the wider body of knowledge which relates to evolutionary dynamics in organisational contexts. I go on to review the variation in meme theory and thereby derive research questions which relate to the possibility of unitary self-replication in culture, especially organisational culture. Next, I describe my empirical method, a narrative approach based on a two-step, first structuralist (Propp, 1968; Barthe, 1975; Latour, 1991) and then evaluative (Labov, 1972; Thompson and Hunston, 2003), application of narrative theory. My analysis and findings are based on a case study, a small printing firm at which I worked in a sales and marketing capacity for approximately four years. Throughout the article, I refer to the firm as CaseCo. Finally, through my findings, I evaluate the validity of the unitary selfish replicator concept in culture.

Locating Memetics in Organisational Research

Theories of evolution have been applied to organisational settings through the concept of universal Darwinism (Dawkins, 1982), which posits that a real evolutionary process, similar to that seen in biology, will occur in any circumstances where the three Darwinian macro algorithmic components of variation, selection and retention operate (Dawkins, 1982; Dennett, 1995; Aldrich et al., 2008). *“Since the time of Charles Darwin on, there have been recurrent attempts to extend ideas from The Origin of Species to social or political, cultural or intellectual development”* (Toulmin, 1972, p319). Consequently, although the term ‘evolution’ is used widely in culture, including organisational cultures, as a euphemism for change (Weeks and Galunic, 2003), more technical visions of an evolutionary dynamic in culture have been proposed, for example, Aldrich (1979; 1999; 2008), McKelvey (1982), Hull (1988), Sammut-Bonnici and Wensley (2002) and Aldrich and Ruef (2006).

Aldrich and Ruef (2006) and Aldrich (1979; 1999; 2008) develop a metatheory of how organisations are manifested by showing how examples of variation, selection and retention can be found in a number of theoretical perspectives of organisations. Sammut-Bonnici and Wensley (2002) suggest that, not only organisational behaviour but the study of the social environments in which organisations operate, for example, economics, sociology, psychology, political science and anthropology, can benefit from an evolutionary account. McKelvey (1982) suggests a classification of organisational species based on biological systematics, because *“... there is strong evidence that natural selection takes place in organisations”* (McKelvey, 1982, p235) and Hull (1988) uses an evolutionary account to show how developments made in scientific communities can be explained. However, these theories omit, or equivocate, over a cultural selfishly replicating equivalent to the gene as definitively universal as Dawkins’s (1976) original proposal of the meme. Consequently, there are two

contradictions between the domains of biological evolution and evolution in organisational settings, the first relating to the role of human consciousness and the second relating to the unit of selection.

The first contradiction is that, where in biology the evolutionary algorithm is blind and without design, the organisational theory maintains elements of human design and direction. Therefore, where an observer might view the evolutionary algorithm playing itself out in the biotic domain and describe a struggle for existence, Aldrich and Ruef (2006) add 'struggle' as a fourth component of the evolutionary algorithm in organisations. However, the maintenance of *any* human free choice seems to be at odds with one of the key insights provided by biological evolution which is that there is no design, direction or space for a teleological account (Dawkins, 1976; 1989; Guttman, 2005).

The second contradiction relates to the bias towards the macro, or algorithmic component, of evolution in organisational theory (Shepherd and McKelvey, 2009) compared to that described in biology, through the modern synthesis of the evolutionary algorithm and genetics. Where genetics is definitive that DNA is the mode of inheritance in biology and genes the units of selection (Dawkins, 1976; 1989), there is no such consensus in the organisational theory. Suggestions for organisational units of selection include internal organisational elements such as competencies (McKelvey, 1982), groups of organisations at the population or community level (Aldrich and Ruef, 2006) and population-like patterns such as organisational fields (DiMaggio and Powel, 1983). Indeed, Sammut-Bonnici and Wensley (2002) summarise a wide range of potential units of selection both internal and external to organisations such as routines, competencies, companies, industries, markets and economies.

These two contradictions between evolution theory in biology and culture mean it is not clear to what extent evolution in cultural phenomena, such as organisations, ought to be considered as a real process. Perhaps it would be more valid to maintain a reflexive use of metaphor, such as that proposed by Morgan (1986), or adopt a more mainstream approach to studying the social world such as discourse analysis. Indeed, Sammut-Bonnici and Wensley (2002) suggest that evolutionary theory cannot answer questions regarding the 'engines' which drive the phenomenon in the abiotic domain. Rather, evolutionary organisation theory must depend on other approaches for their power. However, the meme concept does provide a potential explanation for the engine of cultural evolution because it posits an analogue to the engine of evolution in biology: the gene (Dawkins, 1976; 1989). Indeed Dawkins (1989), by drawing support from Delius (1986), goes so far as to suggest that memes might be real physical neuronal structures inside people's brains.

Meme Theory

In the period since Dawkins (1976) first proposed the meme concept, a number of scholars, for example, Blackmore (1999; 2000), Dennett (1991; 1996; 2003; 2006), Aunger (2002), Lynch (1996), Brodie (1996; 2009) and Distin (2005), have developed meme theory. However, each account tends to return independently to Dawkins's (1976) original meme concept, before the author provides their own vision of a memetic explanation of culture. This, coupled with the lack of critical empirical research, means that a degree of heterogeneity has occurred in what is proposed as fundamental meme theory but, despite this variation, it is possible to identify three broad areas of theorising which I have summarised in figure 1.

PUT FIGURE 1 HERE

The memes as mind viruses theory, which has been developed by Dawkins (1993), Lynch (1996) and Brodie (1996; 2009), suggests that memes are pernicious cultural traits which infect people's minds. However, by limiting the nature of memes in this manner their power to describe wider cultural evolution is diminished. To avoid this dilemma, Brodie (1996; 2009) and Dawkins (1993) suggest that some beneficial memes might be chosen by people but, of course, such a view undermines the notion of a selfish replicator which copies due to its own inherent qualities. To support the position, therefore, an unexplained degree of human conscious decision making is introduced.

The memes and the evolution of consciousness theory, which has been developed by Dennett (1991; 1996; 2003; 2006) and Blackmore (1999; 2000), aims to incorporate a memetic explanation for the phenomenon of human consciousness which is omitted in the memes as mind viruses theory. This variation of the theory makes memes central to how humans experience a 'self', because memes are regarded as constituent elements of human minds. Indeed, Blackmore (1999) suggests that what humans experience as a self is no more than a 'selfplex' of memes. She even goes so far as to disavow her status as the conscious author of her own work. Dennett (2003), on the other hand, reserves some space for human free will because he asserts that people still need to think for their memes to occur.

Despite avoiding the arbitrary identification of pernicious or beneficial cultural traits inherent in the memes as viruses theory, the theories of memetic consciousness, in particular Blackmore's (1999; 2000) theory, rely heavily on the invocation of a rather broad definition of behavioural imitation (Distin, 2005). Consequently, where more complex cultural traits are discussed the authors struggle to avoid implying a conscious self in their own writing and

storytelling. Indeed, when Pratchett, Stewart and Cohen (2002) develop the concepts of memetic consciousness and storytelling together, it is storytelling which seems to be the preeminent factor.

Theories of how memes might be discrete units of culture are offered by Aunger (2002), Deacon (2004), Price (2012) and Distin (2005). Their goal is to address the particularness of culture which is central to the meme concept. Both Deacon (2004) and Price (2012) suggest words as the indicators of units of culture. However, there is a lack of consensus. Distin (2005) rejects this basis of analysis by suggesting that words have variable meaning which is context dependent. Distin (2005) and Aunger (2002) each provide a solution to the problem of particularness which is not dependent on language. To do so, Aunger (2002) proposes the concept of 'neuromemes' and Distin (2005) the concept of 'representational content'. Neuromemes are the electrical signals in people's minds which correspond to elements of culture (Aunger, 2002) and representational content is the information a person has attached to an object (Distin, 2005). However, beyond the arbitrary attribution of meme status to words none of the theories can offer a method for actually identifying memes. Indeed, Aunger (2002) suggests that memes might not be identifiable in the same way as genes in biology and Distin (2005) suggests that the experimental conditions required to identify distinct units of representational content might be too complex to ever be implemented. Consequently, Aunger's (2002) and Distin's (2005) theories stop short of a recommended social science based method for operationalising empirical memetic research.

Although Edmonds (1998) regards memetics as gloriously diverse, the variation in fundamental meme theory means that there is a risk that the meme concept might have dissolved into an imprecise notion of all things to all people (Lynch, 1998). Despite this

concern, the meme concept has been applied to organisational and management theorising (Pech, 2003; Pech and Slade, 2004; Price, 2009; Price and Shaw, 1998; Voelpel, Leibold and Streb, 2005; Vos and Kelleher, 2001; Weeks and Galunic, 2003; Williams, 2000) and a small number of empirical studies based on the meme concept have been undertaken (Best, 1997; Lord and Price, 2001; O'Mahoney, 2007; Shepherd and McKelvey, 2009).

However, due to the variations in the underlying fundamental meme theories, there are a number of problems which become apparent when the research is reviewed as a developing field (Gill, 2012). Each study, for example, bases its arguments on its own arbitrary definition of memes, fundamental theory taken from conflicting perspectives is used to support the theses and there is a tendency to return to genetic theory in support of the arguments which are made. Consequently, none of the applied or empirical studies evaluate the validity of the range of meme theories that are available. Rather, they simply offer memetic views of certain cultural contexts which are not, however, firmly grounded in theoretical consensus.

Indeed, a number of scholars have criticised the lack of progress in validating memetic theory. Lissack (2003) characterises the contribution of memetics to management theory as negligible and suggests that a realist view of memes ought to be abandoned. Similarly, in suggesting that the memetic community should stop what he calls an over ambitious theoretical discussion, Edmonds (2002) calls for smaller scale work that might advance the knowledge of memetic processes. He suggests three avenues for research, including case study research, which might reveal replicating processes in culture. More broadly, McKelvey (1982) points to a general antipathy towards evolution from the social sciences, because of its social Darwinism connotations. With little consensus gained in memetics, the problems of the

unit of analysis and the scope for human free choice, that are evident in the wider ranging organisational evolutionary theory, remain in memetics.

Therefore, in the empirical element of this study, my aim is to evaluate the meme's conceptual basis. To achieve such critical empirical memetics, Gill (2012) suggests that an 'extra-memetic' method should be devised and applied which avoids any assumptions about the nature of memes as part of the study's operationalisation. Therefore, in designing my study I aimed to follow the advice of Gatherer (2005) and problematize memetics by setting the following three research questions:

1. Can organisational culture be divided into units?
2. If so, can such units be seen to selfishly replicate?
3. Can an extra-memetic method be devised with which to answer questions 1 and 2?

To design my extra-memetic method, I returned to Dawkins's (1976; 1989; 1982; 1999) original exposition of the selfish replicator concept in biology. After all, the theory in detail is explicated in respect of the biotic domain. Indeed, rather than pursuing evidence for memes in culture, Dawkins's (1976; 1989; 1982; 1999) own original development of the meme concept is presented almost exclusively on the basis of genetic theory (Deacon, 2004). However, instead of using these sources to arbitrarily construct my own meme definition, my aim was to identify the basic tenets of the theory.

Selfish Replicator Theory and the Optimon

A review of Dawkins's (1976; 1989; 1982; 1999) replicator theory reveals that its logic is based on what he terms the 'optimon' definition of a replicator. An optimon is the genetic material which can be seen to evoke an alternate phenotypic effect, compared with its alleles¹, when all else is equal (Dawkins, 1999). However, although Gill (2012) has previously recognised the optimon's importance to the theory of memes, at no time has the optimon conceptualisation been adopted in the field of memetics.

Though the optimon implies particulate genetic heredity, there is not an atomised link between certain genes and certain phenotypic expressions². Genes work together in an interconnected complex through embryonic development and contact with the environment. Indeed, in today's world of evolved complex order, natural selection favours co-operative ventures of genes which are good at building bodies able to survive and reproduce. So, each gene may influence many phenotypic effects, a phenomenon called pleiotropy (Dawkins, 1976; 1989).

Due to the complex pleiotropic nature of genetic effects, Dawkins (1976; 1989) shows how particular optimon gene definitions are based on the identification of phenotypic expressions which are exposed to natural selection. By adopting this approach, a piece of DNA which can be seen to exert a particular expression in contrast to its allele, when all else in the genotype is equal, can be said to be a gene 'for' that phenotypic expression. Dawkins (1982; 1999) notes how the optimon view of genes rests on the manner in which genetic inheritance was first demonstrated by Gregor Mendel.

Guttman et al. (2002) show how Mendel's laws of heredity were based on recurring proportions of characteristics displayed by subsequent generations of pea plants that flowered

with either yellow or green flowers in a 3:1 ratio, in favour of yellow. The findings show that heredity can be observed as particulate, that each offspring inherits a gene for flower colour from both of its parents (genetic alleles) and that, in the case of the pea plant experiment, the gene for yellow flowers is 'dominant' over the 'recessive' gene for green flowers.

The dynamics of Mendelian heredity³ can be modelled graphically in a 'punnett square' (Guttman et al., 2002), as demonstrated in figure 2, which illustrates the pea plant experiment. One of the two alleles carried by each parent is passed on to their offspring with equal probability due to a process called 'crossing over' (Dawkins, 1976; 1989; 1982; 1999; Guttman et al., 2002). Therefore, the punnett square shows how a 50% chance of inheriting either a dominant or recessive allele from each parent leads to four equally likely scenarios. However, only in case 4 does the offspring plant develop green flowers. In each other case the dominant gene for yellow flowers shows its effect.

PUT FIGURE 2 HERE

Mendel's heredity experiments show how the optimon definition of a replicator depends on a distinction between the replicating entities themselves and their phenotypic effects. Phenotypic effects can be considered as genes' strategies for survival (Maynard Smith, 1982; Dawkins, 1989). They might range from the replicating machinery of cells to behavioural patterns spread across populations and, therefore, it is phenotypes which serve as the mechanism of the macro evolutionary algorithm. Consequently, the bodies of organisms and their behaviours can serve as indicators of genetic programming because any competing variations of the same part of a survival strategy must be due to alternative genetic alleles. Of

course, such an approach involves the assumption that behaviour is not learnt (Dawkins, 1982; 1999) or based on conscious decisions (Maynard Smith, 1982).

Therefore, to operationalise the identification of optimon-type genes, Dawkins (1982; 1999) suggests writing an account of an organism's survival strategy in English⁴, thereby facilitating an assessment of the program encoded in its DNA. In the pea plant example one can write down the survival strategy of the plants and identify the points of competition, such as flower colour, as small variations in the strategy. It is these competing points of variation which constitute the optimon replicators, because if the environment can recognise and act on a particular phenotypic expression to naturally select it, the piece of DNA responsible for it will find its way into the next generation. Consequently, the resulting optimon genes depend on the ability of an observer to construct their meaning. If natural selection, or human observers, were colour blind then the optimon genes for flower colour would evaporate.

As Gill (2012) has noted, an account of a survival strategy recorded in this way can be considered as a narrative account. Indeed, a range of wider factors point to narrative as a useful method through which optimon type units might be identified, for example, narrative is introduced in the theories of memetic consciousness, there is a recurrence of storytelling examples in meme theory and similar written accounts are postulated as measures of both biological and cultural complexity (Gill, 2012). Therefore, to operationalise my extra-memetic empirical research, I turned to narrative theory.

Methods

To facilitate my empirical work, I chose to make my employer's firm, CaseCo, the organisation at which I would base my study. Indeed, it was my experiences whilst employed at a number of manufacturing organisations, including CaseCo, which had led to my interest in organisational evolutionary theory and memetics. Having studied marketing and worked in several sales and marketing orientated roles, I had repeatedly encountered what I took to be negative production orientated working practices which persisted despite not facilitating customer satisfaction. Consequently, the notion of self-replicating cultural traits seemed to me to offer an interesting and useful view of organisations.

Indeed, through an earlier period of ethnographic participant observation at CaseCo, I had identified that for the Managing Director, customers' orders were a natural consequence of a smoothly running firm. However, the Production Manager saw anything that affected the smooth running of production, including orders, as a problem, thereby posing the dilemma that orders mean problems and salespeople bring problems to the firm. In contrast, salespeople saw orders as relief from the stress of sales targets. I concluded that a 'production' perspective dominated a 'sales' perspective and subsequently, the staff who processed the orders found their work stressful as they encountered conflict between the two perspectives in their day to day work.

Therefore, CaseCo provided an interesting case study through which to study competing cultural strategies. Indeed, case study research is particularly useful in instances where the research problem is closely related to the research setting (Hammersly and Atkinson, 1983) and it can be appropriate when little is known about a topic (Gill and Johnson, 2002). After all, Mendelian heredity was discovered through the pea plant case study (Guttman, et al., 2002) and case study research in relation to memetics has been called for by

Edmonds (2002). Of course, being an employee at CaseCo, mitigated problems of participation, time, space, and invisibility (Czarniawska, 1998).

To collect the data, I chose to conduct a period of ethnographic participation at CaseCo. Ethnography is well suited to collecting narrative data (Hymes, 1996; Gubrium and Holstein, 1999; Iverson, 2009) and, because my research interest so directly reflected my own experience, my day to day involvement at CaseCo would constitute relevant data. I would be able to selectively collect data which I judged to suit the goal of my research (Mintzberg, 1970; Hammersley and Atkinson, 1983; Czarniawska, 2004; Chang, 2008). Such an approach has been used successfully in similar studies (Swartzman, 1993; Gill and Johnson, 2002) and I had gained some experience of the approach during my previous research at CaseCo.

To follow the methodology of identifying optimon-type units suggested by Dawkins (1982; 1999), I would first need to write an account of the competing strategies at CaseCo before searching for competing equivalent elements. Consequently, I adopted the two-step approach to narrative analysis suggested by Larty and Hamilton (2011). Their approach enables what Ricoeur (1973) calls a second stage of deep semantic analysis based on an initial structuralist stage. My two stage method is shown in figure 3.

PUT FIGURE 3 HERE

Figure 3 shows how I used a first structuralist analysis, based on narrative units, to facilitate the construction of accounts of how both the sales perspective and the production perspective at CaseCo operated as strategies for interacting with customers. This first step in the analysis then enabled my identification of potential competing variants in the two

strategies which could be analysed further. I based the first step of analysis on a synthesis of the ‘function’ unit of structure (Propp, 1968; Barthes, 1975) with Latour’s (1991) concept of competing programmes of action and, the second step on narrative evaluation (Labov, 1972; Thompson and Hunston, 2003).

The narrative functions were constituted by the actions, events and the actors involved in them. Each action and event can be seen to function in respect of leading to the next action/event, which in turn functions to lead to the next (Propp, 1968; Barthes, 1975; Czarniawska, 2004). The concept of programmes of action (Latour, 1991) suggests that actors and actions can be attributed to different points of view and together they add ‘load’ to the points of view, the point of view with the greatest load becoming dominant in the social context at hand. Both the narrative function and programmes of action concepts facilitate the agency question raised by memetics, because they accommodate non-human actors which might be seen to appropriate agency as they interact with the human actors.

To facilitate my two step approach, I recorded two types of data. Firstly, I collected details of the actions and events at CaseCo, as the people at the firm interacted with customers through orders, enquiries and complaints. This data provided the basis for identifying narrative functions. Secondly, I collected evaluative data in the form of the points of view of the people working at the firm. I recorded the data in participant observation diaries (Mintzberg, 1970; Gill and Johnson, 2002), one for the structural data and one for the evaluative data.

Analysis

I identified 12 narrative functions, four of which functioned to support the sales perspective and four of which functioned to support the production perspective. Another four functions were neutral to either perspective. The neutral functions were largely based around the basic operations of the firm and, consequently, they included a number of non-human actors, for example, orders, proofs, artwork, estimates, job-bags, etc. I have summarised the list of functions and their definitions in table 1.

PUT TABLE 1 HERE

The combinations of the functions listed in table 1 tended to be associated with the interactions between CaseCo and each of the firm's customers, each such collection of functions constituting what Czarniawska (2004) terms a narrative trajectory. For example, an order might be received and then that order would progress through a number of narrative functions until the item ordered was delivered. Therefore, next, I sorted each of the functions by customer and listed them, both in temporal order and with respect to their orientation. Figure 4 shows how the narrative trajectories linked to each of CaseCo's customers progressed over time, one function after another, but also that the trajectories moved between functions related to each of the competing perspectives at the firm and the set of neutral functions.

PUT FIGURE 4 HERE

The data included CaseCo's interactions with 10 customers. By reviewing the interactions of the narrative functions in each narrative trajectory, both as a pattern and in terms of the detail in the data, I wrote an account of each trajectory in English, as suggested

by Dawkins (1982; 1999). By combining the recurring detail in each trajectory, I subsequently constructed written accounts of the sales and the production strategies, excerpts of which are shown below.

Excerpt from the Sales Strategy

When the sales strategy encounters the invocation of the needs of non-human actors by the production strategy, it commentates on them, leading to the expediting of actions in favour of the sales perspective by upholding the customers' view of non-human actors, such as proofs.

Excerpt from the Production Strategy

The production strategy rejects the sincerity of customer requests and invokes the requirements of non-human actors to object to the sales strategy, for example, orders should come before proofs and proofs cannot be produced without a job bag. The production strategy invokes its own view of non-human actors such as proofs and cutter guides.

Writing the two strategies down in English showed that, competition arises around the meaning of the non-human actors. For example, in the excerpts shown above, there is competition related to the meaning of proofs. Indeed, the non-human actor 'proof' appears as a pivotal actor in the narrative trajectories associated with CaseCo's customers because its meaning relates to the manner in which the customers' understanding of their needs becomes known to CaseCo in terms of how the item ought to be manufactured. Consequently, I reviewed the evaluative component of my data by way of an adaptation of Thompson and

Hunston's (2003) noun group concept to assess what the term 'proof' signified to both the sales and production points of view at the firm. I subsequently found that the meaning of proofs varied on 11 dimensions which I have summarised in table 2.

PUT TABLE 2 HERE

Table 2 shows how the meaning of a proof can be conceptualised and bounded through reference to its alternative meaning. Such an approach is similar to that which, through the identification of competing alleles in biology, enables optimon-type gene definitions. Consequently, it is possible to summarise the points in table 2 to construct two optimon-type definitions of proofs, as they are understood at CaseCo. Indeed, they can be summarised as follows.

The sales meaning of a proof is:

Proofs are how a printer accepts the artwork supplied with an order, thereby demonstrating that they have the expertise to fulfil the customer's request. The customer's approval triggers production of the ordered item, which will include correctly printed artwork. Proofs are produced to help indicate important factors in a way which enables them to be approved in a convenient manner and the printer will then use the proof to help produce the product.

Whereas the production meaning of a proof is:

Proofs act as a way of attributing responsibility for the interpretation of a customer's artwork, which CaseCo can print, within the bounds of the printing process. Proofs trigger production once the customer has taken a degree of responsibility for the finished item. The proof, as a representative of the printing process, sets standards and directs the way that customers should operate, in order to receive a good outcome for their orders.

Having constructed two alternative optimon-like definitions of the proof unit of culture at CaseCo, by assuming the dominance of the production strategy at the firm, it is possible to construct a punnett square to model the range of potential contexts which might occur. Figure 5 shows the punnett square model adapted to show the dominant production conceptualisation of proofs and the recessive sales conceptualisation of proofs. Consequently, four outcomes are possible when two people at CaseCo interact with respect to proofing. Only in case four, where both people adopt the sales conceptualisation of proofing, does that conceptualisation manifest itself in the workplace.

PUT FIGURE 5 HERE

Discussion

The cultural strategies I have constructed, although encompassing non-human actors, are deployed by the people at CaseCo either consciously or not. I have constructed the alternative conceptualisations of proofs through the evaluative data gained from my colleagues and myself. Some contributors to narrative theory point out that the narrative mode of knowing and communicating is grounded in peoples' evolved faculties (Gould, 2000;

Cobley, 2001; Czarniawska, 2004). As Cobley (2001) suggests, narrative is held in peoples' memory and used to manage their expectations of the future as events unfold. Therefore, my research supports the notion that cultural information occurred as a result of evolved biological traits and that it resides in people's brains, forming part of who they are in social settings. In this respect, the theories of Dennett (1991; 1996; 2003; 2006), Blackmore (1999; 2000) and Aunger (2002), are supported.

However, the notion that certain cultural aspects might be reduced to distinct neural structures (Delius, 1986; Dawkins, 1989) is not necessarily supported. As is the case for optimon genes, the optimon units of culture related to proofs are constructed as units by me as an observer. Neural connections could play a part in many different optimon units of culture so although Delius's (1986) theory of set physical patterns in the brain is not supported, Aunger's (2002) temporary electrical neuromemes could potentially be but, of course, my research cannot claim to contribute in terms of how the brain actually works.

My identification of two alternative optimon units attached to the word 'proof', suggests that Distin's (2005) rejection of words as memes may be premature, although my research does not suggest that arbitrary symbols replicate (Deacon, 2004; Price, 2012) because the conceptualisations of proofs are grounded in the wider ranging sales and production strategies. However, my analysis points to the manner in which optimon-type replicators must be described by an observer. Words are important but the words used simply indicate a constructed unit of the pleiotropic complexity that is being observed. The labels of optimon units of culture simply identify a portion of culture, or in Distin's (2005) terminology the representational content held in people's brains, constructed by way of its competition with alternative portions.

Such a view means that my analysis appears to cast all the consequences of the cultural knowledge people have as phenotypic effects. However, in biology phenotypic effects are simply evolved forms of replicating machinery (Dawkins, 1976; 1989) and for such a conceptualisation to be valid in culture, the cultural units I have identified would have to selfishly replicate in a Dawkinsian sense. Although I have use a punnett square to model proofs as either dominant or recessive, there are instances in my data where the human actors do consciously consider what proofs should mean. Indeed, my analysis is dependent on the evaluative nature of the contributions made by the people working at CaseCo as they reflect on their points of view. Consequently, I cannot agree with Blackmore's (1999) characterisation of people as meme machines simply acting on the basis of their self-plex by way of behavioural imitation.

My application of the punnett square model illustrates the problems raised by assuming selfish replication in culture. In the heredity demonstrated by Mendel, there is a 50% chance of either a dominant or recessive allele being passed on from a heterozygote parent, due to crossing over in the formation of gametes, hence the observed 3:1 proportions of Mendelian heredity (Dawkins, 1976; 1982; 1989; 1999; Guttman et al., 2002). However, with some degree of reflection and argument by those acting in a culture, the same form of 'replication' cannot be assumed. To do so would be to naively invoke the replicating machinery of sexual reproduction which underpins the punnett square model in genetics. In culture, rather than there being a 50% probability, people can reflect on what conceptualisation of a proof they hold and offer in social situations.

Therefore, it seems that before something as complex as sexual reproduction might evolve in culture, human agency is likely to intervene. As both Maynard Smith (1982) and Axelrod (1990) point out, the ability for people to consciously strategize undermines the notion of replication in culture. In Dawkins's (1999) terminology, through my adaptation of the punnett square model, I seem to be describing something akin to somatic rather than germ line replication which persists while people are distracted from reflecting on their actions. Therefore, my use of the punnett square model should be seen as a way to expose consistencies and inconsistencies between memes and genes. It should not be used to indicate that the processes are the same, simply because the model can be applied to both domains.

Of course, there are more complex models of Mendelian heredity and some genes can be seen to blend (Guttman et al., 2002). However, the simple case of two competing units of culture, modelled in a punnett square, does not seem to support selfish replication because of a fundamental difference in the probability of outcomes due to human free choice. Consequently, pursuing the analogy further in a realist manner would seem to constitute an unwarranted reification of genetic metaphor in culture. Consequently, although the realist meme as virus concept (Dawkins, 1993; Lynch, 1996; Brodie; 1996; 2009) is criticised as naive (Dennett, 1991; Blackmore, 1999) and intellectually lazy (Aunger, 2002), it might still be usefully applied in studies of persisting deleterious cultural traits. Perhaps dominant optimons which are counterproductive to broader goals might be considered pernicious. However, to maintain their validity, the theory ought to only be adopted as a reflectively applied metaphor.

Conclusions

My goal for this research was to evaluate the meme concept in terms of the possibility of units of culture and selfish replication in culture. Through reviewing the underpinning tenets of Dawkins's (1976; 1982; 1989; 1999) theory, I have evaluated the meme concept via the first extra-memetic method. Although I have demonstrated that the construction of optimon-type units is possible in cultural settings, my research does not support the selfish replication of such units, as described in much meme theory.

The value of this work is grounded in its critical comment on the range of fundamental meme theories which can be found in the extant literature and in its development of an extra-memetic method. Future studies which draw on meme theory can, through reference to this work, more critically operationalise their conceptualisations of cultural units. The optimon unit of culture provides an instrumental tool through which competition between points of view and strategies for action in cultural settings might be investigated. By making optimon units distinct from a realist view of selfish replication in culture, studies might draw on genetic metaphor in sociology without implying the underlying assumptions of the natural sciences which are open to accusation of social Darwinism.

I feel that it should be noted, however, that definitive support or rejection of the variants of meme theory ought to be tentative. There are wide ranging claims made in the fundamental meme theories, based on alternate perspectives and differing secondary evidence. A single case study project, despite responding to Edmonds's (2002) call for such work and its similarity to the early studies in biology, cannot wholly resolve such issues.

Notes

¹ Alleles are alternative forms of the same (optimon type) gene.

² Phenotypic effects are the manifested attributes of an organism Dawkins (1982; 1999).

³ Some alleles can be co-dominant or incompletely dominant. Therefore, organisms can be seen to blend in some characteristics (Guttman et al., 2002).

⁴ English is suggested simply because Dawkins (1999) is writing in English. Other languages could be used to the same effect.

Figure and Table Captions

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Figure 2: Punnett Square adapted from Guttman et al. (2002) to show the 3:1 proportions of Mendelian heredity.

Figure 3: A two-step approach to narrative analysis, adapted from Larty and Hamilton (2011).

Figure 4: An Example of a Narrative Trajectory Moving through Time and Between the Perspectives at CaseCo.

Figure 5: Punnett Square to Show the Possible Combinations of the Two Conceptualisations of Proofs at CaseCo.

Table 1: The Narrative Functions Identified at CaseCo.

Table 2: The Dimensions of the Sales and Production Conceptualisations of Proofs.

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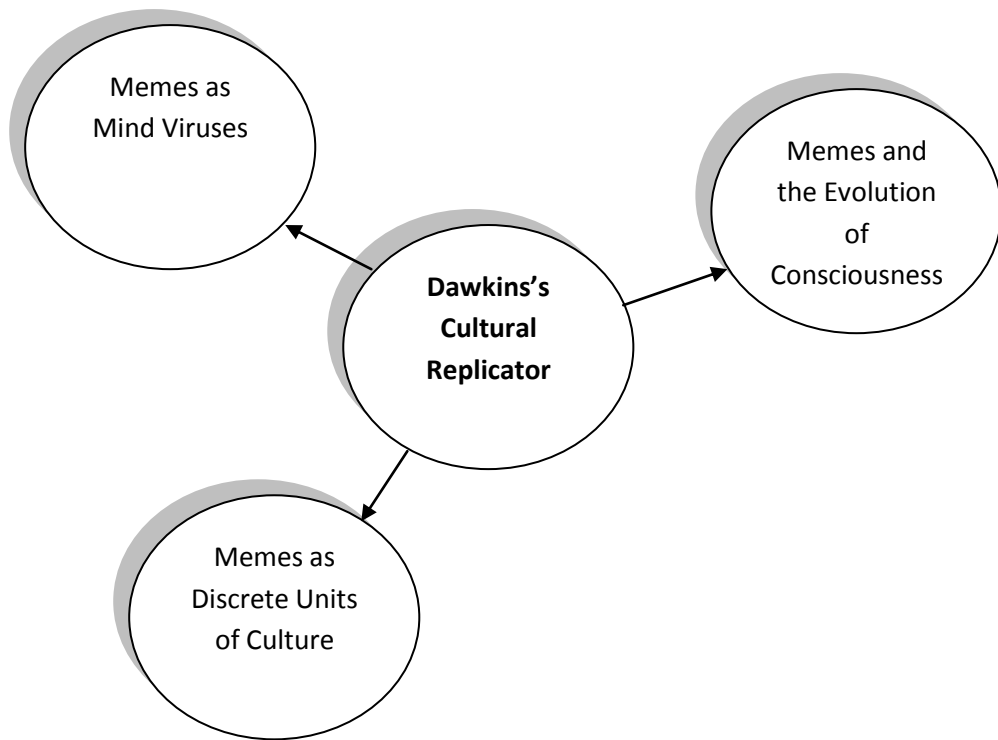


Figure 1: The Alternative Developments of Meme Theory.

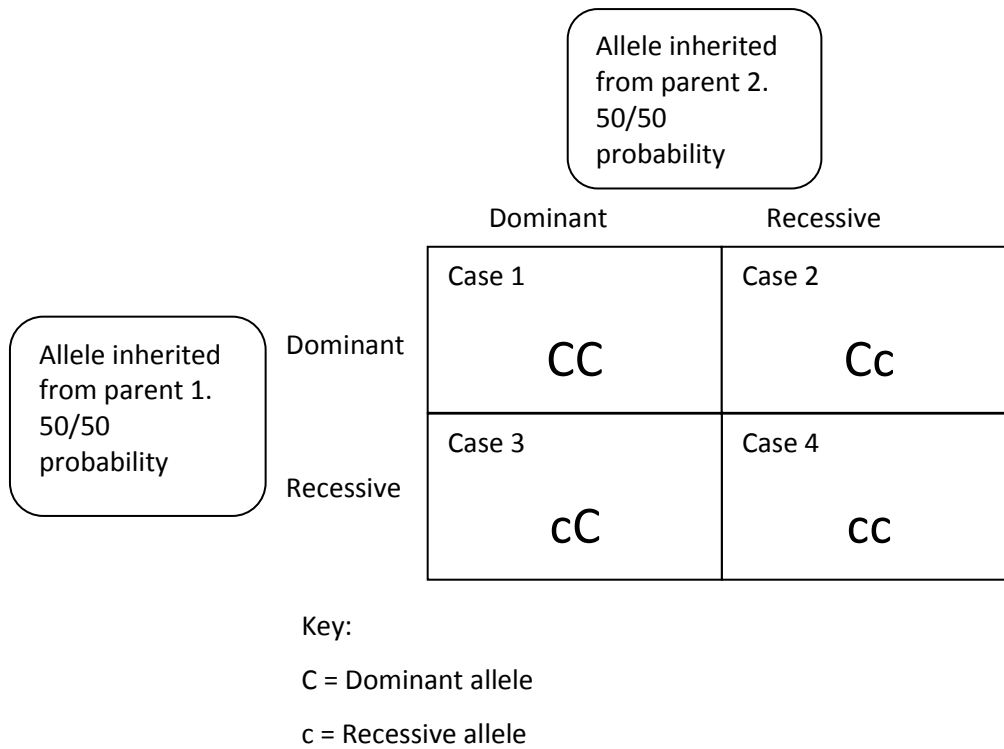


Figure 2: Punnett Square adapted from Guttman et al. (2002) to show the 3:1 proportions of Mendelian heredity.

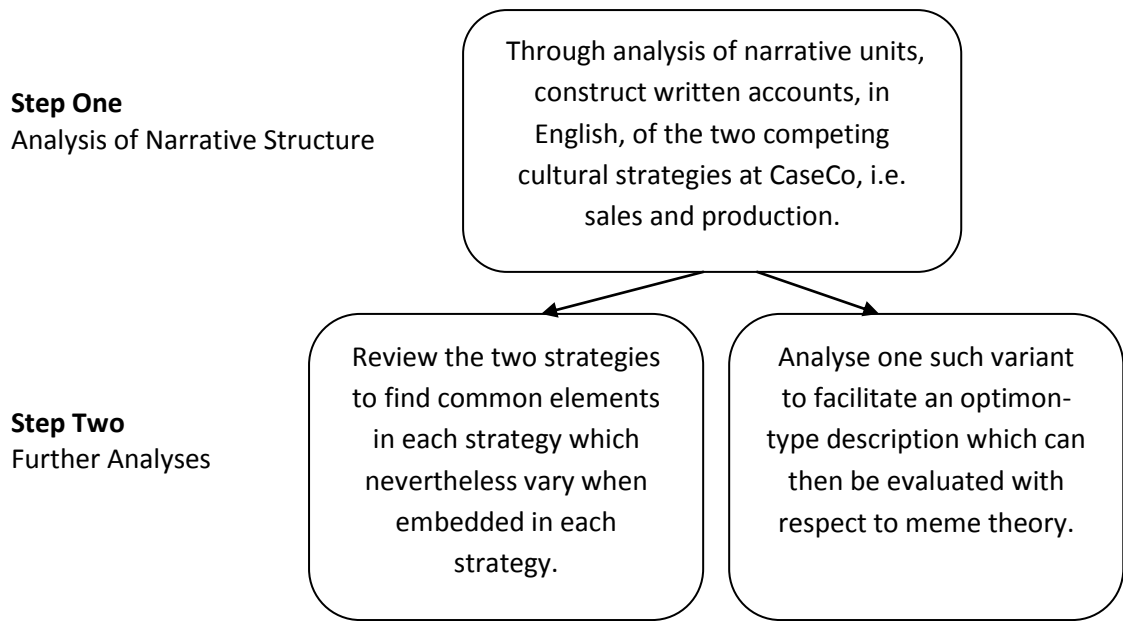


Figure 3: A two-step approach to narrative analysis, adapted from Larty and Hamilton (2011).

Table 1: The Narrative Functions Identified at CaseCo.

Function Category	Function Label	Function Description
Sales Perspective	Customer’s Proxy	Where actions are taken to represent a customer by passing on a request, e.g. in the form of an order, enquiry, complaint, etc.
	Firm’s Proponent	Where actions are taken to explain the perspective of CaseCo to a customer.
	Instigation	Where actions taken on behalf of customers are not instigated by the customer in question.
	Translation	Where actions serve to interpret customers’ needs and then reflect that meaning in CaseCo.
Production Perspective	Objection	Negative actions towards an antecedent action associated with a function of the sales perspective.
	Postponement	Actions in response to an antecedent action associated with the sales perspective which serve to delay further sales orientated action.
	Invocation	Actions which serve to deny the sale perspective through the invocation of CaseCo’s processes and procedures.
	Dismissal	Actions which serve to reject CaseCo’s responses to customer requests.
Neutral Perspective	Commentary	Actions which serve to comment on, or reason about, other action/events to make sense of them.
	Expediting	Actions which constitute the non-contentious aspects of work carried out in response to the needs of customers, for example despatching an order once the items have been manufactured.
	Exploration	Actions taken to explore possible solutions because there is insufficient information to act decisively.
	Submission	Actions which serve to abandon either the sales or production perspective in favour of its alternative.

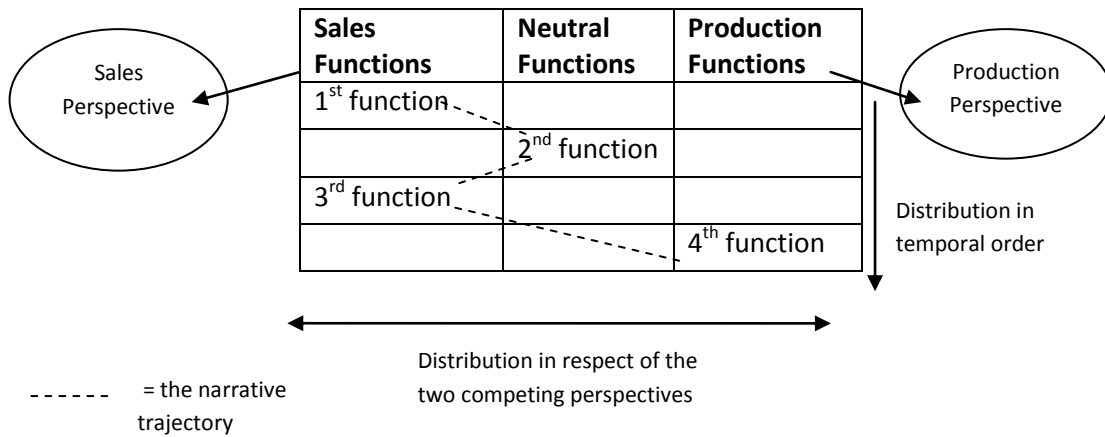


Figure 4: An Example of a Narrative Trajectory Moving through Time and Between the Perspectives at CaseCo.

Table 2: The Dimensions of the Sales and Production Conceptualisations of Proofs.

The Customer/Sales Perspective ...	Compared to	The Production Perspective ...
Sees proofs as an inconvenience and would like proofs to be more convenient	whereas	Sees a more convenient proof as a less accurate proof which transfers some responsibility for the quality of the 'job' to the customer
Sees proofs as the printer accepting that they can produce the items specified by their order	whereas	Sees proofs as the way a customer reconfirms the artwork element of their order.
Reissued proofs can be used to approve only the modified parts of artwork	whereas	Each proof is used to approve the whole artwork
Expect CaseCo to remain aware of possible artwork problems once they have approved a proof	whereas	Sees any further input as an extra benefit of the professionalism of production
Thinks that the proofs should be produced to suit their needs	whereas	Thinks that proofs should direct how customers behave
Looks for the printer to express their expertise via proofs	whereas	Looks to avoid liability for deficiencies in customers artwork via proofs
Sees proofs as an area where printers can compete with each other	whereas	Sees proofs as a way of deflecting complaints, perhaps legally
Thinks that the specification of a proof should be designed to meet their needs.	whereas	Thinks that the specification of a proof should be determined by the needs of the print production process.
Thinks that supplying their artwork in a format specified by CaseCo ensures a valid proof	whereas	Thinks that the pre-press preparation of artwork ensures a valid proof
Sees proofs as objective representations of their artwork	whereas	Sees proofs as a subjectively created impression of what the finished printed item will look like.
Sees proofs as the trigger for producing their order	whereas	Sees proofs as the trigger for manufacturing a job

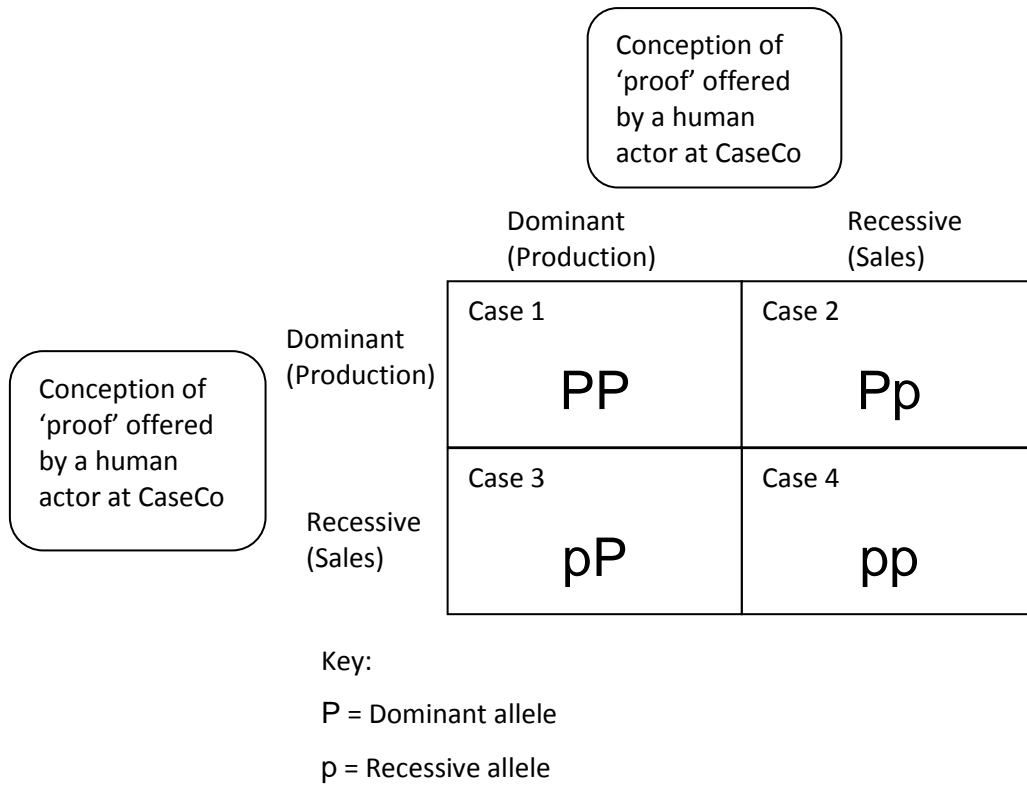


Figure 5: Punnett Square to Show the Possible Combinations of the Two Conceptualisations of Proofs at CaseCo.