A meme-based research programme for management and organization studies

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Abstract

Memes are proposed as cultural equivalents to genes and meme-based research (memetics) has been undertaken to examine cultural aspects of *management and organisation studies* (MOS). However, variable operationalisation of the meme concept for a fragmented range of research topics has hampered the development of a coherent memetic MOS discipline. In particular, there is a largely unrecognised dilemma regarding the ontological status of the meme because it is unclear if the concept represents a real cultural gene-like entity or a gene metaphor. This article provides a fresh view of the applications of the meme in MOS and the degree to which fundamental meme theory supports the memetic endeavour for the field. The paper aims to improve the accessibility of memetics to MOS scholars, whose interests involve cultural phenomena, by summarising the heterogeneity in the extant research and providing the basis for the next stage of the memetic MOS research programme. A conceptualisation is provided to show how applications of the meme can be made, either as a real gene-like entity or a gene metaphor. Ideas are provided for how research can be conducted that will contribute to MOS and support evaluation of the ontological status of the meme.

Introduction

Memes are proposed as cultural equivalents to genes which, through their replication, lead to the evolution of human cultures (Dawkins 1976). Scholars have used the meme concept, in what has become known as memetic research, to examine cultural phenomena, including those of *management and organisation studies* (MOS). However, a memetic MOS discipline remains nascent. This paper investigates the utility of the meme concept for MOS and makes proposals for how a more coherent and formalised programme of memetic research for the field can be achieved.

Memetics appeals because it offers the prospect of general and foundational theories of how culture evolves which provide similar explanatory power and practical value to that achieved for biology through genetics (Dennett 1991; Dawkins 1993; Blackmore 1999; Aunger 2002; diCarlo 2010). The potential for impactful memetic contributions to MOS has been demonstrated through applications of the generative qualities of memes. Useful illustrative examples include Weeks and Galunic's (2003) theory of the firm as an evolved ecology of organisational memetic effects and O'Mahoney's (2007) memetic account of how *business process re-engineering* (BPR) evolved. The premise that the meme can support foundational theories has facilitated memetic explanations (e.g. Price 1995; Weeks and Galunic 2003; O'Mahoney 2007; Shepherd and McKelvey 2009) for long-standing ideas of organisation and management that posit general phenomena, for example, bounded management rationality (March and Simon 1958; DiMaggio and Powell 1983) and persistent organisational routines (Nelson and Winter 1982). The quality of universality, that is embedded in the meme concept, has enabled

memetic explanations of wide-ranging cultural phenomena, for example, the evolution of religious schisms (Lord and Price 2001), voting practices (Gatherer 2004; 2006; 2007; Conley *et al.* 2006) and the viral-like spread of messages through electronic media (Best 1997; Miles 2014; Schlaile *et al.* 2018a).

Based on these applications of the meme, it might be reasonable to expect that the concept would become central to culturally orientated research and yet, it remains relatively unfamiliar or perhaps unfashionable in both MOS and social science more generally (Edmonds 2002; Lissack 2003; Distin 2010; Vada 2015). As a result, there has been a lack of evidence to help evaluate if memes are ontologically real cultural replicators or potentially useful gene metaphors (Mahner and Bunge 1997; Gill 2012), a dilemma which we find unresolved in the memetic MOS literature. Memetics remains an emergent discipline, characterised by a fragmented body of knowledge, an absence of coalesced theory and a lack of agreed protocols for undertaking further memetic research in fields such as MOS, circumstances which can be valuably addressed through systematic review of research related to the field (Burgess *et al.* 2006; Denyer and Tranfield 2009; Adams *et al.* 2017).

New approaches to the literature are often inspired by scholars' personal experience of working in a discipline (Deyner and Tranfield 2009) and this research has been prompted by the challenges we have encountered whilst operationalising the meme concept for applications in MOS. In this article, we aim to demonstrate how the meme can be valuable for scholars working in the field and how its adoption can be made more feasible by (1) summarising the scope of the previous research that has been

undertaken, (2) identifying from the summary obstacles that make the concept challenging to operationalise and (3) using the analysis to propose how the next stage of memetic MOS can be conducted to good effect. Greater clarity in how the meme might be operationalised for research will support use of the concept in studies which recognise that cultural dimensions of organisations and management seem to evolve. Indeed, much MOS theory already includes the proposition that organisational cultures evolve, albeit usually in a non-technical sense (e.g. Hofstede 2001; Schein 2006; Lucas 2010; Fellows and Liu 2013; Fine and Hallett 2014), so there is an opportunity to introduce a technical memetic component to existing knowledge. Where technical applications of evolution have been made using generalised Darwinist principles, which acknowledge the role played by genes in biological evolution (Hodgson 2013), variable notions of what constitutes an analogue of the gene have been suggested in place of the meme (e.g. Aldrich 1979; 1999; McKelvey 1982; Morgan 1986; Hull 1988; Sammut-Bonnici and Wensley 2002). Research that helps to show how the meme can be integrated into the generalised Darwinist view will enable a synthesis of the two domains of knowledge similar to that achieved for biology through synthesised evolution and genetic theory.

To achieve the aims of the research, we asked the following three research questions which were sequenced to help build our contributions. First, to what extent has the meme been operationalised for applications in MOS? Second, what challenges for the formation of a memetic MOS discipline can be drawn from the extant literature and addressed in the next stages of the memetic research programme? Third, how can a more definitive and consistent programme of meme-based research be conducted which

is valuable for both MOS and meme theory? By responding to the research questions, we provide an up-to-date picture of the use of the meme in the field from which scholars tackling evolved/evolving phenomena can identify opportunities for introducing the technical qualities of the meme. However, we find evidence obscured by the fragmented state of the discipline which shows that, the real cultural replicator or gene metaphor dilemma persists due to variability in how the meme concept has been operationalised for MOS research. Similar variability which frustrates progress is shown to be evident in longstanding developments of fundamental meme theory. We construct four alternative versions of the meme concept from the heterogeneity revealed by our analysis and synthesise them, as a set of meme definitions, with the real cultural replicator or gene metaphor dilemma. By drawing on the subsequent novel conceptualisation, we propose how the next stage of memetic MOS can more reflexively operationalise the meme concept in pursuit of (1) making the study of evolving management and organisation phenomena more technical, (2) synthesising memetics and generalised Darwinism for MOS, (3) reflexive metaphorical applications of the meme, (4) advancing fundamental meme theory. We argue that research based on our contributions will help to clarify the ontological status of the meme.

The foundations of a memetic literature: Dawkinsian replicators

We start by considering Dawkins's (1976) premise of the meme as a selfish replicator because it remains the consistent starting point from which the meme concept is adopted throughout MOS. Our review showed that, in some cases, it is the only fundamental theory of the meme cited (Carney and Williams 1997; Whitty 2011; Shabunina and

Pasis 2018) and elsewhere only one additional fundamental meme theorist is cited (Miller 2000; Miles 2014; Holm *et al.* 2015; Stepaniuk 2016; Atadil *et al.* 2017). Where research includes wider ranging references to fundamental meme theory, potentially incommensurable positions tend to be cited in combination (Williams 2000; Vos and Kelleher 2001; Pech 2003; Weeks and Galunic 2003; Pech and Slade 2004; Voelpel *et al.* 2005). Indeed, the heterogeneity of fundamental meme theory encourages the invocation of genetic analogy in its place (Best 1997; O'Mahoney 2007; Shepherd and McKelvey 2009).

The idea of the meme and its role in cultural evolution was first proposed by Dawkins (1976) as an extension of the theories of genetics discussed in his book *The Selfish Gene*. The main emphasis of the book is an argument for recognising genes as chemical replicators which lead to the biological evolutionary algorithm (Darwin 1859) by facilitating the variation and retention of traits that are naturally selected. The term 'selfish' reflects that it is the inherent tendency for an entity to make copies of itself which warrants its classification as a replicator. Dawkinsian genes, therefore, are portions of DNA which compete for the chemicals they need to replicate by generating phenotypic effects, for example, the replicating machinery of cells. As genes come together in complexes known as genotypes (Guttman *et al.* 2002), their combined phenotypic effects culminate in the evolution of complexity evident in the biosphere, including humans. Through their replicating and generative qualities, genes can be wholly attributed with the emergence of biology, instinctual behaviour and cue/response/reward learning which means that, DNA carries information (Guttman

2005) encoded as programs for evolved and evolving biological phenomena (Dawkins 1982; Maynard Smith 1982; Axelrod 1990).

Changes in cultural phenomena which appear evolutionary occur too quickly to be explained by gene-based processes and Dawkins (1976) argued for a second replicator which leads to a separate evolutionary process for culture. To encapsulate both the systemic distinction and relatedness, and with mimesis in mind as the process of cultural transmission, he coined the term meme to accompany the term gene, thereby providing two catchy hyponyms relating to the more general idea of a replicating unit. Information theory enables the conceptualisation of both biological and cultural evolution as ontologically real systems which generate complexity (Gell-Mann 1995; Kirkpatrick 2010), therefore, memes should be thought of as portions of replicating cultural information, a position from which some have developed fundamental meme theory (Blute 2005; 2010; Distin 2005; Heylighen and Chielens 2009; Dennett 2017; Boudry 2018).

Dawkins (1976) combined concepts of biological evolution with contemporary ideas of particulate cultural transmission, for example Cloak's (1975) cultural corpuscles, to propose a range of example memes which he argued could be observed replicating amongst people. He suggested that 'fashions in dress and diet, ceremonies and customs, art and architecture, engineering and technology, all evolve … like highly speeded up genetic evolution…' (1976: 204). Therefore, '… examples of memes are ideas, catchphrases, clothes fashions [and] ways of making pots or of building arches' (1976: 206). Successful memes are those which can compete for attention and find a place to

be retained in humans' limited memory (Dawkins 1976; 1982; Dennett 1991; Blackmore 1999; Heylighen and Chielens 2009). Consequently, the Dawkinsian view follows previous longstanding conceptualisations of culture and biology as similar evolving systems (e.g. Darwin 1871; Campbell 1965; Toulmin 1972) to suggest that, memes are the universal and fundamental units of culture which replicate amongst people due to their inherent qualities.

Although Dawkins's (1976) account of cultural evolution has been read as a sociobiological explanation (Gould 2000; Rose 2000; Boyd 2009), the invocation of a second replicator indicates a more nuanced view. Memes can be considered as an epiphenomenon of biology (Miller 2000) which acts as the coding mechanism for programs that generate complex cultural phenotypes in a rank above biology (Gell-Mann 1995). Memes' replication at the micro level generates a cultural evolutionary algorithm at the macro level as alternative cultural behaviours and artefacts in the social environment vary, are selected and become retained. Although co-evolution between the biological and the cultural domains might occur, they should be considered as distinct evolving systems (Blackmore 1999). In the next section, we describe the review methodology we adopted to gather memetic sources related to the field of MOS which are situated in the distinct level of cultural evolution.

Review methodology

To encourage confidence in the rigour which underpins our findings, the sequencing of this paper is organised around the planning, conducting and reporting stages

recommended for systematic review (Tranfield *et al.* 2003; Denyer and Tranfield 2009). This section discusses the conducting stage, during which the methodology used to search the literature was designed to both take advantage of our preunderstanding of memetic MOS and tackle the fragmented body of memetic knowledge which prompted the research. As a result, we employed an exploratory approach which culminated in three broad stages, beginning with searches of relevant literature databases for memetic MOS sources. Recognising that several of the sources gathered from the database searches had been published in the now defunct *Journal of Memetics* prompted the second stage, a search of that journal's archive. Realising that developments in fundamental meme theory cited in memetic MOS were important to the analysis, led us to the third stage search for fundamental meme theory sources. In the following paragraphs, we describe how the literature search and analysis unfolded together.

Starting with the memetic MOS sources known to us through our previous research, we applied the qualitative research tenet of data saturation (Richards 2015) to conduct iterated searches of the literature databases, adding new sources until we achieved literature saturation where no new sources were returned. To ensure relevant studies were gathered (Tranfield *et al.* 2003), we drew on the first research question, which is focused on the operationalisation of the meme concept in MOS, to explore the *Business Source Premier* and *Scopus* databases using combinations of the search terms; 'meme', 'memes', 'memetics', 'organi[s/z]ations' and 'management' (Adams *et al.* 2017). Initial simple combinations of search terms, used to capture the fragmented contributions to memetic MOS, returned unwieldy numbers of sources. Searching for meme and management in all text, for example, returned more than 5,000 sources from *Business*

Source Premier and almost 10,000 sources from *Scopus*. The frequent appearance of the term meme is due to its informal use in popular discourse as a label for things that are shared or become popular, usually without any link to the technical definition of memes as replicators. The term 'internet meme', for example, is used to describe humorous combinations of text and images that are shared online. Consequently, we filtered the sources by applying more specific search criteria and progressively added sources to those already known to us, following an assessment of their appropriateness for the scope of the study made by reading their titles and abstracts (Denyer and Tranfield 2009). It was only at this initial reading stage that many of the popular uses of the term meme could be identified and excluded.

The more specific search criteria we applied to search the databases were enabled by their advanced search functions. In summary, the following filters were applied. We restricted location of the search terms to titles, keywords and abstracts and, to focus on research which rigorously operationalised the meme concept, we limited the search to peer reviewed journal articles, otherwise known as the 'white literature' (Adams *et al.* 2017). Papers which appeared in our searches because they included the French term '*même*' (same) were rejected by limiting the searches to English language sources. However, use of the French term in English language papers had to be recognised by reading. Searches using the term memetic tended to return papers which considered the use of computerised memetic algorithms to model process management contexts. The literature databases enabled the exclusion of these sources because they contribute to the alternative field of computer intelligence and cybernetics (e.g. Acampora *et al.* 2011; Wang *et al.* 2017) which can be omitted from the search results.

It is worth noting that all the research with which we were previously familiar was included in our search results, an outcome which reinforced our conclusion that literature saturation had been achieved. Therefore, should scholars new to memetic MOS wish to conduct their own literature search as new sources are added to the corpus, they can be confident that using the search terms and filters described in this section will return a comprehensive picture of the discipline. However, until memetic MOS is made more coherent, potentially leading to more precise search terms, to exclude non-technical/popular uses of the term meme, reviewing the titles, keywords and abstracts of sources will remain a relatively laborious part of the literature search methodology.

Several papers returned in the first stage of our literature search were drawn from the now defunct *Journal of Memetics* which led us to conduct the second stage search, a separate review of that journal's paper archive. Whilst this part of the search returned no additional sources which specifically addressed MOS, 8 proved to be of broad value because they provide a commentary on the development of memetics (Best 1997; Edmonds 1998; 2002; Lynch 1998; Lord and Price 2001; Gatherer 2004; 2005; Blute 2005). Following our selection of memetic MOS sources, we had gathered 33 white literature sources which supported analysis in response to the research questions. Only two of the retained sources (Heath *et al.* 2001; Klein 2016) were later excluded from the analysis (Denyer and Tranfield 2009) because during detailed assessment they were found to lack technical operationalisation of the meme as either a real cultural replicator or a gene metaphor.

Therefore, 31 memetic MOS sources were used in the analysis, early stages of which revealed heterogeneity in study design and a lack of standardised empirical data, thereby eliminating the possibility of a straightforward meta-data analysis. Consequently, to conduct the analysis, we adopted a more flexible research synthesis (Tranfield *et al.* 2003) by regarding the sources as case studies of memetic applications (Pawson 2006; Denyer and Tranfield 2009). By drawing on the definition of a concept as '... a bundle of meanings or characteristics associated with certain events, objects, conditions, situations and behaviours' (Ang 2014: 6), we compared and contrasted the operationalisations of the meme in MOS to assess how the concept has been variably constructed and bounded. Taking theory to be defined as the description of the relationships amongst the set of concepts under consideration (Bacharach 1989; Gill and Johnson 2002; Bort and Kieser 2011), we moved on to assess the implications of the alternative conceptualisations of the meme for memetic MOS.

The third stage of the literature review was prompted by recognition that, in memetic MOS there is recurring but variable invocation of fundamental meme theory sources, mostly drawn from the grey literature that has not undergone the peer review processes of scientific journals (Adams *et al.* 2017). Including grey sources can increase breadth of knowledge but at the cost of potentially variable validity (Mahood *et al.* 2014). However, the grey memetic sources cited in memetic MOS are traditionally published monographs, written by authors who explain how they have drawn on academic or organisational experience to construct versions of fundamental meme theory. Indeed, in most cases, methodological issues form an integral part of the monographs and often the

authors acknowledge the critical support they have received from colleagues, thereby indicating some substitution for the formal peer review process. These sources, therefore, are characteristic of Adams *et al.*'s (2017) first tier of the grey literature, where outlet control and source expertise can both be judged as relatively high. We included 16 mostly grey sources in the analysis to evaluate how memetic MOS has made use of fundamental meme theory. Consequently, a total of 46 applied and fundamental memetic sources were used for the analysis because, Price (2012) makes both an applied and a fundamental contribution. Much of the value of our review emerged as we recognised paradoxes in fundamental meme theory which complicate the operationalisation of the meme in MOS. Next, we discuss the analysis and findings of the review.

The scope of memetic MOS

In response to the first research question, this section discusses how our analysis showed that the meme has been adopted to study both organisational forms and various aspects of management activity. Our overview of previous research is provided to encourage similar studies which will extend the discipline. However, we also identify how the meme has been variably applied. Problematising the alternative ways in which the meme has been operationalised shows how the real cultural replicator or gene metaphor dilemma persists in memetic MOS.

Memetics and organisations

Memetic accounts of organisations have described organisational forms as evolved memetic patterns which, once established, persist as institutions (Price 1995; Weeks and Galunic 2003; Sandberg 2007; Wu and Ardley 2007; He *et al.* 2016; Stepaniuk 2016). Weeks and Galunic (2003), in particular, illustrate how introducing the meme can extend knowledge by asserting that a meme-based account of the firm is more comprehensive than either the transaction cost or knowledge-based theories. They propose that the firm is the phenotype of an ecology of organisational memes, selected together because of their perceived functionality and it has been suggested that the phenotypes of specific organisations can be meme mapped through empirical investigation (Schlaile *et al.* 2019). The replication of these memetic organisational patterns has been judged to limit organisational learning and change because, once memes become selected in combination, together they resist new memes which do not fit an established combinatory pattern (Price 1995). In consequence, conventional performance is protected but innovation will tend to be resisted.

Sandberg (2007) provides a memetic account of the emergence of institutions similar to Weeks and Galunic's (2003) memetic theory of the firm. However, he challenges the assumption that memes will produce phenotypes which can be straightforwardly compared to plants and animals, the most familiar phenotypes in biology, because there is no cultural counterpart to sexual reproduction. Instead, he uses Dawkins's (1982) explanation of the extended phenotype and the biological analogies of spiders' webs and beavers' dams to argue that memes' phenotypic effects are limited to the actions they prompt in people. It is the culmination of these actions in populations that constitutes the extended phenotypes of cultural artefacts and institutions. Extended

organisational phenotypes are implied, therefore, by studies that have considered how brands (Wu and Ardley 2007) and services (Stepaniuk 2016) extend into the environment.

Stepaniuk (2016) shows how variable levels of service quality provided by organisations can be described in memetic terms. He argues that social media platforms are a rich source of memetic content because online reviews of service experiences posted by consumers indicate important memes in a 'meme pool' of service quality. The volume of memetic content which accumulates complicates the organisational goal of gaining consumers' attention through advertising (He *et al.* 2016), however, promotional messages might be derived from meme mapping consumption contexts to understand what memes are present and how they are connected (Atadil *et al.* 2017). Wu and Ardley (2007) develop the marketing perspective by discussing how organisations' brands can be conceived as meme like entities which undergo an evolutionary process because they exhibit variation and encounter selection before becoming retained by consumers. They argue that successful brands/memes have fitness in terms of their fulfilment of customer needs and the brand owners' strategic objectives. The possibility of meme-based fitness assessments of management action and organisational forms has been recognised by Sandberg (2007) as an indication of the potential value of the meme concept for the field. However, he reverts to analogies of sexually reproducing animals to acknowledge that, as producers adapt to maintain the attractiveness of their value propositions, memetic arms races might occur, similar to those of biology where predators and prey compete to maintain adaptations for survival.

Our review of applications of the meme to study organisations reveals arguments for processes of meme variation and environmental selection which lead to evolved organisational phenomena. A real cultural evolutionary algorithm is implied which enables the introduction of associated concepts such as meme phenotypes but the potential for the cultural context to vary from its biological counterpart has been recognised, for example, Sandberg's (2007) claim that culture lacks an equivalent to sexual reproduction of phenotypes. The selective use by MOS scholars of illustrative biological analogies, for example, sexual reproducing organisms or predator/prey interactions suggests that, in fact, there could be a degree of metaphorical explication of the memetic accounts. Hence, the real cultural replicator or gene metaphor dilemma persists in the research.

Memetics and management

Memetic accounts of management have sought to explain how organisational capabilities and resources are managed (Holm *et al.* 2015; Swailes 2016; Roy 2017) and how new management ideas and related forms of practice emerge, gain popularity and persist (Carney and Williams 1997; O'Mahoney 2007; Brooks 2008). The premise that memes have an inherent replicative tendency has proved useful for investigating why management practices and ideas can endure whilst appearing to be deleterious to organisational performance (Carney and Williams 1997; O'Mahoney 2007; Whitty 2011) and, where a poor safety culture evolves, to people's health (Brookes 2008). O'Mahoney (2007), for example, drew on Weeks and Galunic's (2003) memetic account of the firm to suggest that *business process re-engineering* (BPR) is an outcome

of memetic processes because business improvement programmes vary, are selected and then retained amongst managers. He argues that BPR became a retained memetic pattern by successfully competing against alternative management practices to spread amongst many organisations in a manner akin to an infection because, rather than providing any real benefits, BPR memes are innately attractive to managers.

A similar criticism of project management has been made (Whitty 2011) by arguing that the organisation of work into projects is the outcome of a collection of related memes that successfully replicate amongst people in organisations which have evolved the project management pattern. Such organisations become primarily the mechanisms for replicating the project management memes rather than the means through which valuable projects are completed. Memes such as the *Gantt* chart help to provide a positive emotional response by cueing feelings of control for people in organisations, even when they have little or no actual control. Project managers signal their credibility by displaying reassuring project management phenotypic effects, which in combination are equivalent to the biological analogy of peacocks' tails, a trait evolved through sexual selection to signal a credible mate. Correspondingly, Swailes (2016) presents the emergence of talent management practice as the culmination of an evolved complex of memes which succeeds, in addition to any contribution to business performance, because its innate attributes are appealing to managers.

The invocation of an algorithmic process of variation, selection and retention, where the innate attributes of meme variants lead to their replication and the persistence of potentially deleterious management practice, implies real memetic processes. However,

similar metaphorical applications of the meme have been made to explain, for example, how the practice of downsizing has persisted despite negative accounts of its benefits (Carney and Williams 1997). Therefore, the degree to which any of the accounts are real or metaphorical is open to a debate, the opposing sides of which can be distinguished by reflecting on the proselytising of professional bodies, management gurus and consultants (Carney and Williams 1997; O'Mahony 2007; Whitty 2011; Price 2012; Swailes 2016). These phenomena can be conceived as real phenotypic effects of the memes that help the established memetic patterns of management to replicate at the expense of alternatives, or they can be understood as sources of expert guidance, the following of which by managers might be described metaphorically as memetic replication.

Other apparently realist memetic management contributions assume greater management agency to make their focus the presentation of useful meme-based management interventions. Specific attention has been directed at contexts related to innovation (Pech 2003; Voelpel *et al.* 2005) and marketing (Marsden 1998; 2002; Williams 2000; 2002; Miles 2014), for example, Williams (2000; 2002) identifies memes as the basis for a science of marketing. Both he and Marsden (1998; 2002) argue that successful marketers can design and manage infectious memes which, once included in advertising, represent attractive lifestyles for consumers. Similarly, where innovation is judged to be restricted by established patterns of memes, Voelpel *et al.* (2005: 64) suggest the innovation meme, which is '... a unit of cultural transmission that carries information responsible for innovations', can be manipulated to increase the innovativeness of an organisation. Therefore, it is assumed that managers are able to

avoid susceptibility to memetic replication and engender innovation through meme creating, meme tracking and meme shaping, activities which could perhaps be regarded as forms of memetic engineering (Price 1995; Pech and Slade 2004; Roy 2017). Actors with the ability to resist the innate attractiveness of memes and achieve changes in real established memetic patterns should be recognised as intellectual shamans who evoke new powerful memes that can help people reframe and rethink how they view and interact in the world around them (Waddock 2015), thereby extending their bounded rationality (March and Simon 1958). However, allowing space for free decision making implies a metaphorical operationalisation of memes' innate replicative qualities.

Reviewing memetic MOS has demonstrated that the qualities of the meme concept have supported its flexible use. However, the flexibility has been accompanied by variable assumptions about how specific memes replicate in different research contexts and, as a result, the real cultural replicator or gene metaphor dilemma persists. We next consider the challenges for forming a coherent memetic MOS discipline that occur due to the variable use of the meme concept in the field.

The challenge of inconsistent operationalisation of the meme in MOS

In response to the second research question, we investigated the variable use of the meme in the field to identify challenges for further development of the memetic MOS discipline. In this section, we discuss two problematic forms of inconsistent operationalisation of the meme concept that we identified. The contributions to memetic MOS demonstrate the novel insights which can be achieved through a foundational and

general concept of culture, and they should provide the basis for a cohesive memetic discipline. However, despite previous recognition that the meme has been variably operationalised (Gill 2012), a lack of consistency remains in terms of how memes are identified as discrete cultural units and the degree to which free decision making is assumed when invoking memetic replication. We argue that inconsistency related to these factors is likely to sustain the real cultural replicator or gene metaphor dilemma, thereby inhibiting the further adoption of the meme concept and the impact which can be claimed for memetic studies.

The first form of inconsistency relates to the identification of cultural units. To date, the operationalisation of memetic units of culture has varied with the cultural elements that have been proposed as memes. MOS scholars have variously defined memes as; core elements of culture which are imitated (Voelpel *et al.* 2005), modes of thought (Weeks and Galunic 2003), self-replicating ideas or thoughts (Carney and Williams 1997; Pech 2003; Sandberg 2007; Waddock 2015), distinct memorable units (O'Mahoney 2007), anything that is copied between people (Vos and Kelleher 2001), semantic reflections of the mental state of the recipient of specific content (Stepaniuk 2016), threads on social media (He *et al.* 2016), cultural instructions for how to make, use or think about things (Whitty 2011), virus-like catchy ideas (Miles 2014), semiotic representations (Price 2012), parts of organisational narratives (Gill 2012) or meaningful and compatible units of knowledge (Schlaile *et al.* 2019).

The variable definitions of memes are problematic for integrating the data and findings of the various studies. Schlaile *et al.* (2019), for example, acknowledge the variation in

meme definitions and understandably resort to citing the meme definition included in the *Oxford English Dictionary* before recognising Voelpel *et al.*'s (2005) definition but operationalising memes by drawing on the definition of Schlaile *et al.* (2018b). Of course, the various meme definitions relate to a similar phenomenon but subtle variation in the nature of memes is implied. In this case the question remains, to what extent are core elements of culture (Voelpel *et al.* 2005) or meaningful and compatible units of knowledge (Schlaile *et al.* 2019) the same or different? Consequently, the further development of a realist memetic discipline for MOS through the generalised operationalisation of real cultural units is inhibited.

There is similar variation in the operationalisation of the meme which leads to the second form of inconsistency, the degree to which memetic replication is assumed to limit free decision making. Some MOS scholars have used the meme concept to show how deleterious practices can persist through their innate attractiveness to managers whilst others have suggested managers can manipulate memes for their own ends. Due to the natural selection of undirected variability, the gene based evolutionary algorithm is generally acknowledged to be blind, whereas it is difficult to avoid including some degree of human free choice in management solutions. As yet, there is no consensus evident in the memetic MOS literature, or wider memetic theory (Schlaile 2021), regarding how to judge this matter. The difficulty of maintaining a consistent view is illustrated by Williams's (2004) critique of management consultants' active promotion of new managerial memes, such as BPR and downsizing, to achieve their own desired outcomes, potentially at the expense of their clients' organisations. In this context, managers are assumed to be susceptible to the innate replicative qualities of memes

whilst the consultants can direct the replication for their own ends. Similarly, although Miles (2014) points to the paradox of claiming to design advertising messages to spread in a viral manner, because viral epidemics are unplanned, the prescriptions for meme-based marketing management (Marsden 1998; 2002; Williams 2000; 2002) assume that managers can manipulate memes whilst customers remain susceptible to the innate replication of memes. Perhaps, therefore, the assertion that memes are real self-replicating entities should be abandoned, leaving replication to be applied only as part of the gene metaphor.

As the memetic MOS discipline is developed, both realist and metaphorical operationalisations of the meme concept may prove useful but greater recognition of the nature of the operationalisation would support more precise and useful presentation of the findings. Generally, MOS scholars have not reflected on how their studies can help to inform judgements about the degree to which memes ought to be operationalised as either real cultural replicators or a gene metaphor. However, the extent to which memes might be real cultural replicators has been considered in the range of research monographs available in the grey literature (Dennett 1991; 1995; 2003; 2006; 2017; Brodie 1996; Lynch 1996; Blackmore 1999; 2000; Aunger 2002; Distin 2005; 2010; Heylighen and Chielens 2009; Blute 2010) and a limited number of contributions to the white literature (diCarlo 2010; Price 2012) which we consider next.

The challenge of alternative strands of fundamental meme theory

To further develop our assessment of the challenges for memetic MOS, made in response to the second research question, we extended the analysis to consider how the meme has been conceptualised as a real cultural replicator in fundamental meme theory. This section describes how we found heterogeneity similar to that evident in memetic MOS because there are unresolved debates in the fundamental theory. The lack of consensus has led to critique, including some recommendations for future memetic research but also abandonment of the realist view of the meme concept.

Debates in fundamental meme theory

Having found that the real cultural replicator or gene metaphor dilemma is maintained by variable operationalisation of the meme concept in MOS, we argue that fundamental meme theory is best conceptualised as three alternative strands. The main tenets of each strand are summarised in Table 1, row four of which shows the key assumptions that relate to the definition of cultural units and how innate replicative qualities of memes may limit free decisions.

Table 1. The alternative strands of fundamental meme theory relevant to the inconsistent use of the meme in memetic MOS

Strands of fundamental meme theory	**Memes as mind viruses (Strand 1)**	**Memes as consciousness (Strand 2)**	**Memes as discrete cultural units (Strand 3)**
Principal contributions	Dawkins (1993) Brodie (1996) Lynch (1996)	Dennett (1991; 1995; 2003; 2006; 2017) Blackmore (1999; 2000) diCarlo (2010)	Aunger (2002) Distin (2005) Blute (2010) Price (2012) Heylighen and Chielens (2009)
Main tenets of the theory	Memes are ideas which infect people's minds and direct their behaviour, potentially in ways which do not reflect reality or provide the best outcomes for their wellbeing. Examples provided include religions or smoking. However, to maintain the meme's universal applicability, a dichotomy is invoked. Infectious memes replicating due to their innate qualities are classed as 'causal' or 'cultural'. Whereas memes which are freely chosen by people are classed as 'descriptive' or 'designer'.	A mind independent of memes cannot be assumed because, to maintain their status as replicators, memes must be the fundamental units of consciousness. Any cultural phenomenon can be considered as a memetic unit because all culture is memetic. Memes are universal so the dichotomy of the mind virus theory is rejected.	To maintain a valid theory of the meme, cultural transmission must be shown to be particulate, either in the way cultural information is known by people or through the way it is symbolically exchanged. Resolving the issue of particulate transmission still leaves space for alternative assumptions regarding free decision making.
Key assumptions regarding free decisions and units	*Primary concern*		
	Free decisions. People can freely choose their memes but, through people's natural tendency to imitate, some memes might spread by way of their innate attractiveness to the human mind.	*Free decisions.* Human free will is significantly limited, perhaps wholly, because imitation is the primary mode of meme replication.	*Cultural units.* To make the meme concept valid, memes should be closely and universally defined units of cultural knowledge.
	Secondary concern		
	Cultural units. Memetic units are broadly defined as recognised examples of virulent cultural variants which are usually judged to be deleterious by the observer.	*Cultural units.* Memetic units are broadly defined because all culture is memetic so whatever is recognised by an observer as replicated culture is the meme of interest in that circumstance.	*Free decisions.* The proposition of particulate culture does not necessarily imply limited free choices.

Strands 1 and 2 of fundamental meme theory make the extent to which innate replication may limit free decisions their primary concern, however, their different assumptions leave an unresolved debate over the matter. Strand 1 suggests that memes infect a pre-existing non-memetic consciousness and culture like a virus so humans can, with effort, overcome memes' innate attractiveness and exercise free choices (Dawkins 1993; Brodie 1996; Lynch 1996), On the other hand, strand 2 makes memes a crucial component in the manifestation of consciousness and culture so people's capacity to make free decisions is at least significantly limited and perhaps an illusion (Dennett 1991; 1995; 2003; 2006; 2017; Blackmore 1999; 2000; diCarlo 2010). Put more simply, memes either parasitize pre-existing minds or lead to minds.

Providing a universal definition of memetic units is the secondary concern of fundamental theory strands 1 and 2 because, in each case, specific memes tend to be defined instrumentally to support the arguments for how memetic replication might limit free decisions. Contributors to strand 3 of fundamental meme theory have made the identification of memetic units their primary concern and debated what constitutes the correct definition of a universal cultural unit (Aunger 2002; Distin 2005; Heylighen and Chielens 2009; Blute 2010; Price 2012). However, not only has consensus regarding the correct form of unit yet to be achieved, having focused on the question of units, these developments of meme theory also vary in the assumptions related to their secondary concern, the extent to which people can exercise free decision making. Price (2012), for example, locates significant degrees of agency in the attractiveness of linguistic signifiers whereas Distin (2005) assumes more extensive free decisions.

Criticism of fundamental memetics

The variation in key assumptions shown in Table 1 reveals that fundamental meme theory exhibits the same heterogeneity we have identified in memetic MOS. We argue that the lack of synthesis will have encouraged the criticism of the premise of a universal replicator for culture that has been directed towards the meme, both from within and outside the discipline. Lissack (2003) has encouraged the abandonment of realist memetics, proposing instead an instrumental view of memes as indexicals. Generalised Darwinists have suggested that evolution in management is too different from its biological counterpart to warrant a gene analogy (Breslin 2011). Richerson and Boyd (2005), for example, maintain that culture evolves, but they reject the possibility of stable particulate units of culture. More generally, McKelvey (1982) has identified an antipathy towards evolution amongst social scientists, because of the connotations of 'social Darwinism' and Aunger (2000) points to the social sciences as the primary adversaries to the 'evolutionarization' of social phenomena. Midgley (1979; 1983), for example, objects to what she takes to be the naive invocation of the qualities of natural science in social science. Indeed, in the absence of clearly defined fundamental theory, much applied memetic MOS research does resort to genetic and biological analogy.

Responding to the criticisms, Gatherer (2005) has claimed that memetics should be problematised to find empirical questions with which to refine the theory and Edmonds (2002) has suggested that the memetic community should stop what he judges to be an over ambitious grand theoretical discussion, calling instead for smaller scale work that

will advance knowledge of memetic processes. To date, when MOS scholars have operationalised the meme, there has tended to be a failure to consistently draw on the alternative strands of fundamental meme theory. Often this encourages the return to genetic and biological analogy, thereby weakening the value of meme theory (Edmonds 1998; Lynch 1998) and limiting the validity of the meme concept to that of a gene metaphor (Gill 2012). We recommend that, scholars adopting the meme for MOS should reflexively consider and evaluate the alternative strands of fundamental meme theory which are categorised in Table 1 with respect to the matters that sustain the real cultural replicator or gene metaphor dilemma. Next, we consider how a more systematic and robust memetic research programme might be conceived based on greater reflexive interaction between applied and fundamental memetic research.

Towards a memetic research programme for MOS

In this section we respond to the third research question, which asked for the proposal of a more definitive and consistent programme of memetic research for MOS, by arguing for research that tackles the heterogeneity evident in the reviewed literature. To support the endeavour, we show how four alternative conceptualisations of the meme can be constructed from our analysis and used to form the basis of reflexive, 'extra-memetic' operationalisation of the concept. Greater recognition of the challenges posed by variable fundamental meme theory will support further useful contributions to MOS and much needed evaluation of whether the meme should be operationalised as a real cultural replicator or a gene metaphor.

Recognising the challenge posed by variable fundamental meme theory

To make fundamental meme theory actionable for memetic MOS, in Figure 1 we have drawn the two key dimensions of variability previously summarised in Table 1. Doing so facilitates plotting the various positions of the fundamental meme theory strands with respect to their assumptions about the scope for free decisions and the nature of cultural units. We have added Dawkinsian genes to the dimensions shown in Figure 1 to contextualise how the developments in fundamental meme theory fit with Dawkins's (1976) original description of selfish replicators as pieces of DNA that are universally defined as units of natural selection with innate replicative qualities.

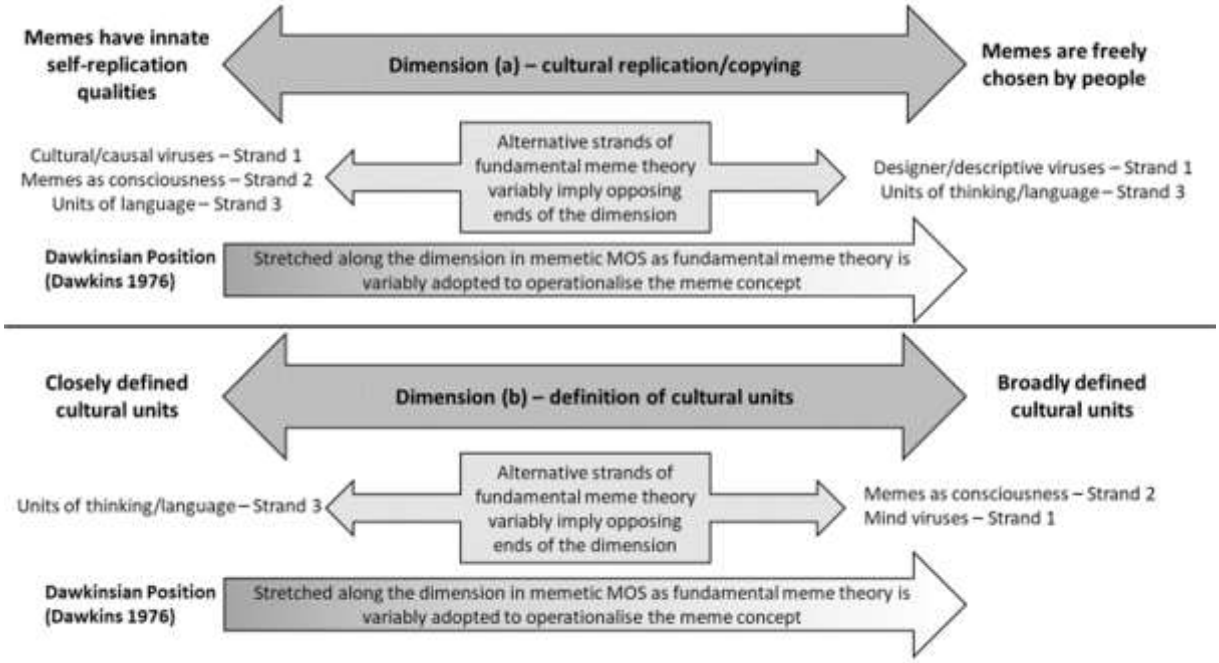

Figure 1. Fundamental meme theory shown in respect of the two dimensions of variability identified in memetic MOS

Figure 1 shows how those applying the meme must contend with inconsistent fundamental meme theory. Price's (2012) work on selfish signifiers remains the closest match to our summation of Dawkinsian replicators but no strand of fundamental meme theory definitively matches the position of its genetic counterpart. Consequently, the tendency for MOS scholars to avoid the fundamental debates, turning instead to either Dawkins's (1976) original brief explication of the concept and/or genetic analogies is perhaps unsurprising. However, Figure 1 illustrates how the inconsistent operationalisation of the meme identified in our analysis of memetic MOS has led to stretching of the Dawkinsian replicator characteristics. We have labelled the dimension relating to replication and the potential for limited free decisions as (a) and the dimension relating to the definition of cultural units as (b).

In terms of dimension (a), each applied study tends to assume that people can freely manipulate memes to some degree. However, there is a lack of consistency in the assumptions depending on how people in different roles such as consultants, managers or customers are judged to act together in variable contexts. Implying that some memes infect people's pre-existing ability to freely manipulate other memes means that, in effect, the causal/cultural and descriptive/designer dichotomy of the meme as virus position is adopted (refer to Table 1). However, where free management decisions are proposed, often support for the manner in which the meme is defined is drawn from the memes as consciousness theory which rejects the wholly free manipulation of memes, (e.g. Williams 2000; Vos and Kelleher 2001; Pech 2003; Weeks and Galunic 2003; Pech and Slade 2004; Voelpel *et al.* 2005; O'Mahoney 2007). Therefore, the logic for

the arguments which are presented is stretched out from the Dawkinsian position, along dimension (a).

In terms of dimension (b), at face value, it seems that each applied memetic contribution to MOS makes a closely defined judgment regarding what ought to be considered as a cultural unit, thereby locating organisational memetics towards a close unitary definition. However, as we have discussed, there is a lack of consensus over what ought to be considered as a cultural unit. Consequently, the location of memetic MOS as a discipline stretches away from a close Dawkinsian definition of cultural units as each new conceptualisation is added to the corpus.

The need for extra-memetic MOS research

For memetics to gain ground in MOS, the potential of the meme concept, which is indicated parochially in each memetic MOS contribution, should be reinforced through demonstrating the reliability which might be expected of a general concept. To do so, the validity of the positions shown on the dimensions modelled in Figure 1 should be assessed through extra-memetic research which reflexively draws on fundamental meme theory to avoid embedding unrecognised and potentially paradoxical assumptions about the nature of memes in their operationalisation (Gill 2012). A goal of extra-memetic studies should be the contribution of evidence to either support the discovery of a realist memetic theory or show how the meme should be applied as a gene metaphor.

To support the operationalisation of the meme concept into MOS, in Figure 2 we have combined the two dimensions of variability shown in Figure 1 to summarise four distinct conceptualisations of the meme. Each conceptualisation can be considered as an alternative bundle of meanings and characteristics (Ang 2014) which should be reflexively construed when the meme concept is synthesised with MOS theory by setting it in relationship with other relevant concepts (Bacharach 1989; Gill and Johnson 2002; Bort and Kieser 2011). In doing so, MOS scholars can avoid further proliferation of meme definitions and unrecognised assumptions regarding how replication might limit free decisions. Instead, studies should adopt familiar approaches to sociological research and, therefore, useful conventional accounts of phenomena important to the field can be an inherent part of the extra-memetic research programme (Gill 2012). We briefly discuss each of the four conceptualisations shown in Figure 2 to provide researchers with initial ideas for their reflexive adoption.

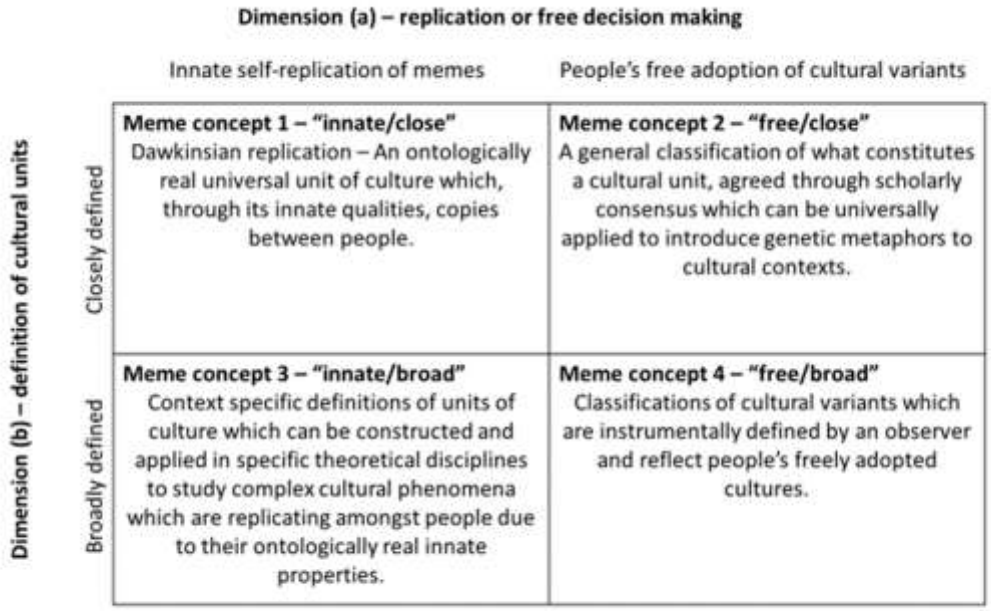

Figure 2. Four alternative conceptualisations of the meme

Introducing the alternative meme concepts

Meme concept 1 represents a realist adoption of Dawkins's (1976) replicator concept where memes, as various but consistently defined self-replicating units of culture, are selected and retained in people's brains (Delius 1986). It implies that, generative properties of memes lead to the evolution of real complex cultural phenotypes including organisational forms such as firms (Weeks and Galunic 2003). Researchers adopting this conceptualisation of the meme can draw on the memes as consciousness strand of fundamental meme theory to recognise in their studies that, free management choices are limited and potentially no more than an illusion (Blackmore 1999; Dennett 2003) gained through the variation, selection and retention of memes in our brains (Dennett 1991). This conceptualisation of the meme can also accommodate the idea that causal/cultural memetic viruses might infect people's memetic minds (Dawkins 1993; Brodie 1996; Lynch 1996). However, researchers should refer to the memes as discrete units of culture strand of memetic theory (Aunger 2002; Distin 2005; Heylighen and Chielens 2009; Blute 2010; Price 2012) and aim to discover a general definition of cultural units. When reporting studies based on meme concept 1, a highly reflexive mode of engagement and writing should be employed in recognition that authors are presenting their own retrospectively organised account of the memetic processes which have taken place in their brains (Dennett 1991; Blackmore 1999).

Meme concept 2 maintains an objectivist, universal definition of units of culture combined with a commitment that people can freely choose what cultural variant they

adopt. Scholars operationalising this conceptualisation of the meme should reflexively engage in the search for a universal cultural unit by drawing on the ideas presented in the memes as discrete units of culture strand of memetic theory (Aunger 2002; Distin 2005; Heylighen and Chielens 2009; Blute 2010; Price 2012). However, the notion of selfish replication should be applied only as metaphor for what are assumed to be goal directed decisions made by people. Researchers, who adopt this position, might draw on the memes as mind viruses strand of theory to identify descriptive/designer viruses (Dawkins 1993; Brodie 1996).

Meme concept 3 maintains a realist tenet of innate replicative tendency in cultural phenomena but abandons the idea that such phenomena can be identified by way of a common and universal form of cultural unit. Consequently, a realist notion of selfish replication is assumed but it can only be applied through the subjective and instrumental identification of relevant cultural phenomena. Researchers who adopt this position can reflexively draw on the memes as consciousness theories (Dennett 1991; 1995; 2003; 2017; Blackmore 1999) or the ideas of causal/cultural memetic viruses (Dawkins 1993; Brodie 1996). However, assuming general innate replication eliminates the possibility of making value judgements about certain cultural traits made from a privileged non-memetic position, for example, the classifying of smoking and religion as negative cultural viruses (refer to Table 1). Indeed, this conceptualisation is likely to be particularly difficult to adopt because researchers would be constrained by the need to justify their choice of cultural units whilst maintaining an assumption of limited space for free researcher decision making in their own work.

Meme concept 4 rejects a realist commitment to both a general cultural unit and selfish replication and, therefore, abandons the idea of a real Dawkinsian cultural replicator. Rather, it describes a position from which a range of genetic and evolutionary metaphors might be adopted to help study a cultural context. Therefore, researchers adopting this conceptualisation of the meme ought to indicate how they have used any of the fundamental theories of the meme to reflexively construct a useful metaphorical account. Due to the ontological difference between the concepts described in quadrants one and four of Figure 2, to avoid the unwarranted reification of metaphor, we urge scholars to make their application of this conceptualisation overtly metaphorical. Such research does already exist, for example, Heath *et al.*'s (2001) study of the spread of urban legends.

Together, the versions of the meme concept shown in Figure 2 accommodate the variation in fundamental meme theory. Of course, we have identified in the literature four alternative notions of what was initially proposed as a universal concept. However, by recognising their underlying assumptions, any of the four versions of the meme that we have described can be reflexively operationalised for MOS, thereby avoiding naively embedding the heterogeneity related to free decision making and the definition of cultural units that is evident in the nascent discipline.

Discussion

The meme concept asserts that there is a cultural replicator which plays a similar foundational role in the evolution of culture to that of genes in biological evolution.

Reviewing memetic MOS has shown the value gained through using the universality of the meme to introduce the concept to a range of contexts. The recurring non-technical use of the idea of evolution and the applications of generalised Darwinism in the field suggests that there is much scope to extend memetic MOS. However, to date, operationalisations of the meme concept have varied with respect to the definition of cultural units and the implications of cultural replication for free decision making, leading to the persistence of the real cultural replicator or gene metaphor dilemma. The similar heterogeneity we have found in fundamental meme theory, is problematic for resolving the dilemma in applied research.

Memetics has yet to exhibit Darwin's (1859) tenet of the patient accumulation of facts and triangulation of numerous field observations that supported his discovery of the evolutionary algorithm, a finding which has been triangulated further by similarly established genetic discoveries in what Huxley (1942) termed the ‘modern synthesis’. Whether or not the meme can facilitate similar progress to that achieved through knowledge of its genetic counterpart in biology remains to be seen and the difference in what is known about the two replicators is reflected in the criticisms of memetics. We argue that the findings of our analysis can provide the basis for a memetic research programme which contributes both useful knowledge for MOS and evidence with which the real cultural replicator or gene metaphor dilemma can be investigated and ultimately resolved. In this section, to advance existing research, we synthesise our findings to conceptualise how (1) useful progress can be made for MOS by using the meme to add technicality to studies which invoke evolution, (2) a synthesis between memetics and

generalised Darwinism can be pursued, (3) the meme can be applied as a gene metaphor and (4) memetic MOS can help to develop fundamental meme theory.

Conceptualising the way forward through extra-memetic MOS

In pursuit of further valuable contributions, the next stage of memetic MOS should be cognisant of how the real cultural replicator or gene metaphor dilemma relates to the four versions of the meme concept we have identified. The conceptualisation shown in Figure 3 illustrates how the debates in fundamental meme theory can be conceived as a boundary demarcating the realist and metaphorical views of Dawkinsian replication, as it is described in *The Selfish Gene* (Dawkins 1976). Extra-memetic research, which avoids unrecognised a priori assumptions during the operationalisation of memes and makes judgements about their ontological status part of the findings (Gill 2012), can evaluate the validity of the alternative meme concepts. Therefore, scholars should reflexively place their operationalisation of the meme in one of the four quadrants of Figure 3 and remain aware of the relationship their research has with the real cultural replicator or gene metaphor dilemma.

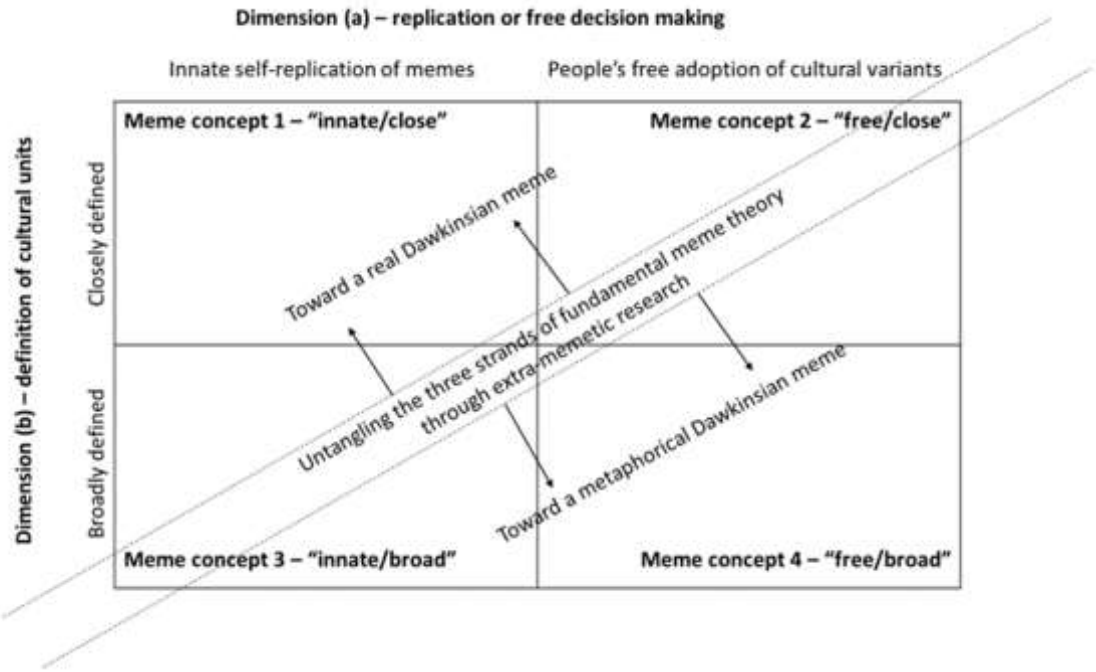

Figure 3. Alternative directions for the development of meme theory

Recognising which of the four alternative meme concepts has been operationalised for each research study will facilitate and encourage assessment of the possibility of a universal cultural unit and the degree to which innate replication might limit free decisions. Evidence for a real closely defined universal cultural unit which has innate replicative qualities (meme concept 1), will support an evolutionary account of culture similar to the Dawkinsian account of biology. Where universal units and innate replication are not shown to be real, the meme as a Dawkinsian replicator should be recognised as a gene metaphor (meme concept 4). It would be a category error to conclude that selfish memes are real when they are, in fact, a useful combination of ontological and personification metaphor (Lakoff and Johnson 1980) for cultural phenomena that may be real but not real self-replicating units. Of course, Figure 3 also accommodates the discovery or metaphorical description of cultural phenomena that are

described by meme concepts 2 and 3. Together, the alternative versions of the meme we have proposed can support adoption of the concept in a range of research contexts where a more technical use of evolutionary ideas could be beneficial.

Memetics and generalised Darwinism in MOS

Evidence for real memetic processes, Dawkinsian (meme concept 1) or otherwise (meme concepts 2 and/or 3), would help to support a synthesis between meme theory and ideas of management and organisations grounded in generalised Darwinism. Of course, some applications of macro evolutionary processes in organisations already adopt an overtly metaphorical stance (e.g. Morgan 1986) but those who adopt a generalised Darwinist view assert that a real evolving system will occur wherever variation, selection and retention occur together (Aldrich *et al.* 2008). However, they lack a generally accepted micro element that is equivalent to the gene in biology. In turn, therefore, an equivalent to the biological modern synthesis (Huxley 1942), which unites the macro evolutionary algorithm with the micro processes of gene replication, has not been achieved in the field of MOS, where the idea of a Darwinian process remains less convincing than its biological progenitor (Scholz and Reydon 2013). It is worth remembering that Gregor Mendel's discoveries of particulate inheritance of characteristics, which proved crucial in demonstrating the genetic mechanisms of Darwin's (1859) evolutionary algorithm, remained undiscovered by those attempting to tackle the problem for thirty-five years (Guttman *et al.* 2002). Consequently, the meme's relatively limited adoption should not be taken, at this stage of its development,

as evidence for a lack of validity in the assertion that the concept does represent a real cultural replicator in the Dawkinsian or some other sense.

Memes as metaphor

If a metaphorical element to the meme's operationalisation is recognised, any cultural phenomenon can be explored through genetic metaphor without the need to resolve the problems of the realist memetic view for that instance. Those favouring a wholly metaphorical position will be able to adopt meme concept 4 and draw on the wealth of genetic and biological metaphors indicated by Dawkins (1976) and others, perhaps in a development of Lissack's (2003) memes as indexicals idea. Recognising the underpinning tenets of meme concept 4 will support its reflexive use, thereby limiting the risk of unwarranted reifying of the specific metaphors used. Subsequently, the criticism that memetics leads to naive realist interpretations of culture based on genetic analogies or a drift into a realist invocation of the Lamarckian inheritance of acquired characteristics might be avoided. Sandberg (2007) points to the persistence of Lamarckian traits in the theories of universal Darwinists, critiquing those who he argues conflate the two views of evolution, for example, Hodgson (2001) and Knudsen (2001). The possibility of a Lamarckian process, which has been raised in relation to the meme (Heylighen and Chielens 2009; Dennett 2017), can be explored through our meme concepts 2 and 4 because, they describe potentially directed processes of replication which would lead to evolution where Lamarckian acquired characteristics could be retained.

The potential for contributing to fundamental meme theory

By conducting extra-memetic research, MOS can contribute critical evaluation of fundamental meme theory and indicate the validity of the alternative strands we have identified. Doing so will help to resolve the paradox that there are four versions of the meme available for memetic MOS, but three relevant strands of fundamental meme theory, none of which directly match Dawkinsian replication as it is described for genes (Dawkins 1976; 1982). In terms of the distinction we have recognised in the memetic sources identified for the review, we are calling for the scope of the white memetic MOS literature (Adams *et al.* 2017) to be expanded to expose the problems of defining cultural units and the impact of replication on free choices to rigorous peer review. Our review has shown that, to date, these matters have been largely debated only in the grey literature.

Reflexive memetic MOS will also facilitate debate of some of the wider aspects of fundamental meme theory that we have not addressed here because we have identified the operationalisation of replication and cultural units to be the pressing matters for MOS. However, we can point to some potential avenues which research might explore. Despite the invocation of the concept of memetic phenotypes in MOS (Weeks and Galunic 2003; Sandberg 2007; Whitty 2011), for memes, the replicator/phenotype distinction remains unresolved (Vada 2015). Indeed, it has been argued that conceiving memes to exist in peoples' minds and their phenotypes to exist in the environment is too simplistic (Dennett 1991) or even that there is no such replicator/phenotype distinction in culture (Heylighen and Chielens 2009).

The recognition that evolution builds complexity, which can be conceived as information (Gell-Mann 1995), has enabled scholars to consider the meme concept from a more abstracted position than the three strands of fundamental meme theory we have identified (Blute 2005; 2010; Heylighen and Chielens 2009; Dennett 2017; Boudry 2018). The information-based point of view can usefully encourage a flexible account of how memes and potentially their phenotypes might be manifested but it can also lead to a dissolution of the key characteristics of the meme, including the meme/phenotype distinction. A tautology can arise because, if memes are the units of cultural information, then all cultural information must be memetic and, therefore, any copying of information must be memetic replication (Heylighen and Chielens 2009; Boudry 2018). However, where the abstracted information point of view is invoked to suggest that memes might be substrate neutral, there tends to be a need to revert to the human brain, mind or memory to account for the spread of memes (Heylighen and Chielens 2009; Dennett 2017; Boudry 2018) which implies there is, in fact, some form of meme/phenotype distinction.

The lack of clarity regarding the meme/phenotype distinction means that, in turn, there has been a lack of development of the germ/soma distinction which is important in complex biology (Dennett 2017). Germ-line replication occurs as genes are inherited from one generation to the next, for example, through gametes in sexually reproducing species, and somatic replication occurs as biological phenotypes, for example our bodies, are maintained through the generation of new body cells (Dawkins 1982; Guttman *et al*. 2002). The lack of a definitive account of germ-line replication in

memetics has meant that replication has been assumed to only take place between people (e.g. Blute 2010; Boudry 2018) but also assumed to take place in individuals' brains (e.g. Dennett 1991; Aunger 2002).

Clearly, much work is required to develop and synthesise fundamental meme theory. We argue that, focussing on operationalising and judging potential management and organisation memes through the four alternative versions of the meme concept we have provided can orientate research around a more rigorous approach to developing meme theory. Through memetic MOS, evidence can be gathered for matters such as the meme/phenotype distinction and germ/soma equivalence in culture. However, an extra-memetic approach will ensure useful findings for the topics of MOS, no matter what the outcomes mean for the validity of the meme concept and fundamental meme theory.

Conclusion

We have set the scene for a memetic MOS research programme where the operationalisation of the meme can be conducted via a research protocol which involves reviewing the alternative strands of fundamental meme theory to synthesise a definition of cultural units with a view of the nature of replication. Recognising the meme concept that has been adopted as one of the four alternatives we have provided will help to show how memetic MOS is orientated as a discipline and, therefore, make meme theory more attractive and accessible to scholars working in wider, established areas of the field. This will help support the growth of a more coherent memetic MOS discipline that can provide impactful research for the field and evidence with which the ontological status

of the meme can be evaluated, eventually resolving the real cultural replicator or gene metaphor dilemma.

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