Heteropathic vs. Homopathic Resource Integration and value co-creation in service ecosystems

Linda D. Peters[a]

[a] Nottingham University Business School, Jubilee Campus, Nottingham, NG8 1BB, UK

Tel.: +44 115 84 66602; fax: +44 115 84 66667.

E-mail address: Linda.Peters@nottingham.ac.uk.

Revision submitted December 2015

Acknowledgements: The author thanks Professor Robert Lusch (University of Arizona) for comments on an earlier draft of this paper.

doi:10.1016/j.jbusres.2016.02.033

ABSTRACT

While the notion that resource integration is central to understanding value co-creation in service ecosystems, there is currently no clear and detailed definition of resource integration. The philosophical concept of emergence makes a clear distinction between instances of resource integration based on emergent relations between resources, here termed Heteropathic Resource Integration, and instances of resource integration based on summative relations between resources, here termed Homopathic Resource Integration. It is the new emergent properties that result from Heteropathic Resource Integration that become an important factor in enhancing resourceness and thus value co-creation. Using the concept of emergence, Heteropathic Resource Integration may lead to new emergent properties in service ecosystems, properties which may help and/or hinder the viability of service ecosystems. The assessment of the value co-created by resource integrators may be related to these new emergent properties.

Keywords: Emergence, Resource integration, Value co-creation, Value appraisal, Service ecosystems

Heteropathic vs. Homopathic Resource Integration and value co-creation in service ecosystems

1. Introduction

Vargo and Lusch (2011) propose a service ecosystems view of value co-creation, defining a service ecosystem as a relatively self-contained, self-adjusting system[s] of resource-integrating actors. This view places the integration of resources as a central means for connecting social and technological aspects of markets (Vargo & Akaka, 2012). However, the mere presence of resources does not imply resource integration per se. Lusch and Vargo (2014) imply that it is only when the resourceness of resources is recognised and acted upon that potential resources become actual resources. Thus the notion of resource availability and integration is particularly important in the field of marketing.

Taking a service ecosystem perspective on value co-creation is useful as it seeks to offer a more holistic, dynamic, and systemic view of value co-creation (Wieland, Polese, Vargo, & Lusch, 2012). Wieland et al. (2012) suggest that value can be conceptualised in terms of a change in the viability of a system, and that complexity and openness are important attributes of system dynamics. Ecosystems, in their view, are: (1) open and each instance of resource integration and value co-creation changes the nature of the system itself and thus provides a new context for the next iteration of value co-creation; (2) complex, in that every service ecosystem is both a provider and a client of service, is overlapping and is nested with other service ecosystems; and (3) that systems seek greater viability (i.e. survivability and well-being) though relational consonance (i.e. compatibility between system elements) and resonance (i.e. harmonious interactions among actors in the service ecosystem). Service ecosystems may range in size and scope from the smallest (the individual and their interactions with others) to the largest (the global economy; Wieland et al., 2012). This view

reflects changes in systems thinking, which has evolved from first-order (or hard) conceptualisations of systems as anti-reductionist (the system cannot be understood purely in terms of the nature and constitution of its parts or components, but must recognise the relationships between them as well) to second-order (or soft) conceptualisations where systems are self-referential (or cybernetic: Mingers, 2014).

Two key concepts are related to resources in Service-Dominant Logic (S-D Logic): *integration* and *interaction* (Peters, Löbler, Brodie, Breidbach, Holllebeek, Smith, Sörhammar, & Varey, 2014; Löbler, 2013). The underlying assumption is that all interactions of resources somehow lead to resource integration. The proposal of differing types of resource integration processes challenges this assumption. While considering interaction a necessary condition for resource integration, not all interaction leads to resource integration, or indeed results in resource integration in the same way. Resources could simply interface, with no integrative processes taking place at all. On the other hand, interaction between resources can result in resource integration processes. Use of the philosophical concept of emergence makes a clear distinction between two such processes: instances of resource integration based on emergent relations between resources, and instances of resource integration based on summative relations between resources. For this reason, understanding resource integration as a process that results in either emergent or summative relations between resources has several key benefits, not least of which is the ability to differentiate clearly between types of resource integration processes and their results.

The main contribution of this paper is to formulate a definition of resource integration that focuses on two different types of resource integration processes: one based on the concept of emergence and the other based on the concept of aggregation or summation. In addition to providing a concise definition of differing types of resource integration processes, this paper also explores the implications of this definition for understanding how the novel properties

that arise from emergent resource integration processes operate, and how such properties link to resourceness and value co-creation in service ecosystems through the value assessment of the beneficiary.

In the next section, we explore the philosophical concept of emergence, and discuss its key features related to understanding resource integration as either a summative or an emergent process. In the third section we discuss how the concept of essentialism helps us to relate these types of resource integration processes to the appraisal of value, illustrating our discussion with the work of McColl-Kennedy, Vargo, Dagger, Sweeney and Kasteren (2012) on health care customer value co-creation practice styles. We then conclude our paper with implications for managerial practice and further research in the area of resource integration. We provide a glossary of terminology and sources as an appendix, which summarises definitions of key terms.

2. Resource integration as emergent or summative processes

What exactly does the term 'emergence' mean? Bhaskar (2008, p. 49) defines it thus: "In emergence, generally, new beings (entities, structures, totalities, concepts) are generated out of pre-existing material from which they could have been neither induced nor deduced." Smith (2010) asserts that emergence is the process of constituting a new entity with its own particular characteristics (i.e. structures, qualities, capacities, textures, mechanisms) through the interactive combination of other, different entities that are necessary to create the new entity but that do not contain its characteristics. In other words, in emergent processes it is the relation or interaction of parts – not merely the parts themselves – that gives emergent properties their existence. Put simply, the emergent whole is more than the sum of its constituent parts. Thus, we define *emergence* as a process that generates *new emergent*

properties (e.g. entities, structures, totalities, concepts, qualities, capacities, textures, mechanisms, etc.).

Therefore, while some researchers maintain that resource integration is the result of specific interactions (Ballantyne & Varey, 2006; Fyrberg & Jüriado, 2009), it is clear that interaction alone provides an insufficient conceptual foundation for understanding resource integration. While interaction represents a *necessary* condition for resource integration processes, it is not in itself a *sufficient* condition for all instances of resource integration because interaction may result in two distinct kinds of effect.

According to the Stanford Encyclopaedia of Philosophy (2013), Mill (1843) coined the terms *homopathic* and *heteropathic* for these two types of effect. Homopathic effects, and the laws that govern them, follow the principle of the composition of causes in which the total effect of several causes acting in concert is identical to the sum of the effects of each of those causes acting alone (Mill, 1843), later termed resultant effects (Lewes, 1873). For example, if two opposing forces exert pressure on an object, one from the north and one from the south, the final resting place of the object is exactly the same as if firstly the northern force had acted upon it, and then the southern force. Another example would be the nutritional benefits of eating a fruit salad. If you eat all the apple pieces first, and then the melon pieces, or if you eat a combination of apple and melon in each spoonful, the nutritional benefits are identical. In other words, it is an aggregative or summative effect in which the joint effect of several causes is simply the sum of their separate effects. This is *Homopathic Resource Integration*, based on summative resource integration processes.

The second type of effect coined by Mill (1843), heteropathic effects, and the laws that govern them, are those in which the joint action of multiple causes is not merely the sum of effects of the relevant causes. While Mill (1843) considers both homopathic and heteropathic types of laws as causal laws and both such effects as causal interaction, it is the latter type of

effect that the philosophical school known as the British Emergentists term ‘emergent’ (McLaughlin, 2008), and which is defined here as *Heteropathic Resource Integration*, based on emergent resource integration processes.

This distinction led emergentists to propose two kinds of laws. Intra-ordinal laws which relate to events within an order, and trans-ordinal laws in which higher-level properties emerge from lower-level ones. Such trans-ordinal laws relate to what Broad (1925) terms ultimate properties (i.e. attributes, qualities, features, characteristics, types), or those properties not deduced from the properties of the component parts. An example would be the ‘wetness’ of water, an emergent property that cannot be attributed to the properties of hydrogen or oxygen in isolation, but which acts according to trans-ordinal laws. Such new emergent properties can, of course, become inputs into new resource integration processes (emergent or summative).

The concept of emergence makes a clear distinction between instances of Heteropathic Resource Integration based on emergent processes where trans-ordinal effects and laws operate to create new emergent properties, and Homopathic Resource Integration based on summative processes where intra-ordinal effects and laws operate to create a combination of the existing properties of the constituent parts alone. The following statement thus forms a starting point for analysis, as an axiom (or premise) rather than a proposition (Williams, 2012):

> ***Premise 1:*** *Processes based on either emergence (underpinned by trans-ordinal effects and laws that result in emergent relations between resources and new emergent properties) or summation (underpinned by intra-ordinal effects and laws that result in summative relations between resources and a combination of pre-existing properties) are*

both a necessary and a sufficient condition in distinguishing Heteropathic from Homopathic types of resource integration.

2.1. Key features of Heteropathic and Homopathic Resource Integration

Having identified the process of emergence as the key characteristic that distinguishes differing types of resource integration, other key features of the concept of emergence might help to clarify how Heteropathic and Homopathic Resource Integration differ. These are logical consequences (or corollaries; Williams, 2012) of *Premise 1*.

2.1.1. Non-reducibility

Heteropathic Resource Integration is fundamentally a non-reductionist process. The notion that emergent properties are both novel and unpredictable stems from the work of Alexander (1966) who maintains that a quality is novel in the sense that it has not occurred before, and is unpredictable in the sense that it could not be predicted. It is not possible to explain the quality any further than this, and therefore it is necessary to accept the quality with natural piety (Alexander, 1966). Novelty and unpredictability therefore form key features of an emergent property. As Smith (2010, p. 28) notes: "By trying to understand entities by reducing them to their component parts existing at lower levels, reductionists miss what are often the most important qualities of things, their irreducible emergent properties". Non-reducibility is also a key feature of complex service systems (Wieland et al., 2012; Mingers, 2014) in which a holistic view of value co-creation phenomena is required. Thus, the implication for understanding value co-creation in S-D Logic is that there may be instances where reducing value co-creation processes to their constituent components (i.e. actors, resources, etc.) is appropriate (for Homopathic Resource Integration) and there may be

instance where it is not (for Heteropathic Resource Integration) because these component parts alone will not account for what emerges from the value co-creation process.

Lawson (2013) sees processes of emergence as primarily compositional, where components are organised rather than simply aggregated. The emergent entity (or whole) emerges together with the entity's *organising structure*, or emergent relations. This organising structure is a property of the emergent whole, but is not identical to it (Lawson, 2013, p. 286) and therefore does not allow us to reduce the characteristics of these new emergent properties to the properties of the constituent resources themselves. This is a key difference between Heteropathic Resource Integration, in which emergent relations mean that resources integrated in this way may not be reduced to their component parts, and Homopathic Resource Integration, where summative relations allow such resource disaggregation. Therefore:

> ***Premise 1 – Corollary 1:*** *It is not possible to explain the new emergent properties resulting from Heteropathic Resource Integration by reducing them solely to the properties of the base resources integrated (i.e. Heteropathic Resource Integration is non-reducible).*

2.1.2. Stratification and supervenience

Stratification, which in systems theory is the hierarchy or nesting of systems (Mingers, 2014), distinguishes between structures and the events they generate (Bhaskar, 1975). Therefore, while the intra-ordinal laws that characterise Homopathic Resource Integration relate to events within an order and are thus 'flat' or non-stratified, the new emergent properties found in Heteropathic Resource Integration will be at a different level than that of the base (or basal) resources themselves. Nevertheless, these new emergent properties

supervene (i.e. are dependent) upon their base resources (McLaughlin, 2008) meaning that a change in these new emergent properties cannot take place other than through a change in the constituent resources themselves. This idea translates, in S-D Logic terms, into the phenomenological determination of value and relates to how actual events are supervenient (i.e. reliant) upon our perceptions of the world. Thus value relates not simply to what actually emerges from Heteropathic Resource Integration, but also to our perceptions of these events. If we do not perceive these new emergent properties as valuable, then even if they are available we are unlikely to benefit from them.

Thus, summative effects are the joint effect of several causes and simply the sum of their separate effects, making Homopathic Resource Integration (based on such summative effects) non-conditional in time and space. In other words, if the north force moves the object first, and the southern force follows, the object will end up in the same place as if both forces had been exerted their effects at the same time, or indeed the same place had firstly the south force operated and then secondly the north force operated.

However, this is not the case for heteropathic effects. While it is not possible to understand the new emergent properties by reducing them to the sum of their constituent parts, nevertheless they can have feedback effects on such parts (Bhaskar, 2008). Thus time and space (i.e. process) is an important feature of Heteropathic Resource Integration. This focus on spatio-temporal process reflects a systems view of resource integration; such feedback will change the systems as a whole in some way (Wieland et al., 2012), and is fundamental to understanding the dynamic behaviour of real-world systems (Mingers, 2014). The implication for value co-creation in S-D Logic is that Heteropathic Resource Integration may result not only in perceived value for a specific beneficiary, but also for the wider system as a whole, and that this value co-creation process is subject to the specific spatio-temporal conditions under which it happened. Thus, supervenience and stratification are critical aspects of

resource integration as a process. This conclusion means that similar base resources may result in very different emergent new properties depending on the temporal ordering and the interdependence of system levels found in that specific process. Humphreys (1997, p. 4) argues that understanding of emergence requires a strict criterion of event identity, in which "... the exact time and way in which an event occurs is crucial to that event having the identity it does." The importance of this spatio-temporal rhythmic to supervenience should not be underestimated. Being conditional in time and space means that differing new emergent properties may result from the integration of identical resources under different spatio-temporal conditions. Supervenience is not simply a dependency relationship; it is also a spatially and temporally bound process. Thus, we propose that:

> ***Premise 1 – Corollary 2:*** *While the new emergent properties resulting from Heteropathic Resource Integration will be at a higher level than the base resources themselves (i.e. it is stratified), they are nonetheless supervenient (i.e. dependent) upon their lower-level base resources in both time and space.*

2.1.3. Downward causation

Downward causation, and its correlate causal reduction, is a serious concern in the philosophical discussion of emergence (Lawson, 2013). Simply stated, it means that "…. emergent properties are to have their own distinctive causal powers and they are also able to exercise their causal powers 'downward' with respect to the lower levels from which they emerge" (Kim, 2008, p. 140). Thus, as Kim (2008) argues, there is a fundamental problem with the emergence of a tautological loop of causality, in which the results of emergent resource integration processes (i.e. the new emergent properties) can affect the resources from which they arose. Humphreys (1997) addresses this problem of downward causation by

proposing that emergence is a process of fusion, in which resources themselves are subject to basal loss. When emergence occurs "...the lower level property instances [i.e. base, or basal, resources] go out of existence in producing the higher level emergent instances" (Humphreys, 1997, p. 7). Similarly, Löbler (2013) states that resources may not only 'become', but conversely, specific resources can cease to act as resources when they are no longer part of value-creating processes. Basal loss then allows the avoidance of downward causation because the basal properties no longer exist, and cannot compete as causes with the new emergent property.

However, there is a problem with basal loss as an answer to the issue of downward causation. As Wong (2006) notes, the basal properties giving rise to an emergent property also constitute myriad non-emergent structural properties of the system as a whole. "If these lower level properties literally ceased to be in fusing into [the new emergent property], then so, it seems, would those structural properties. These structural properties may include those crucial to the proper functioning of the system" (Wong, 2006, p. 355)'. This observation echoes the distinction Lawson (2013) makes between the emergent entity itself and the emergent relations or structure that comes with it. Resources may be involved in multiple functions, and only some of these may relate to any given emergent property. Therefore the notion of basal loss cannot solve the problem of downward causation, as it neglects the structural properties that may also be reliant on these basal resources. This conclusion reflects a service ecosystem view of value co-creation in that such ecosystems are wholes that are overlapping and nested (Wieland et al., 2012). The implication for understanding value co-creation in S-D Logic is that resources may be integrated to form new emergent properties (e.g. new relationships or structures) at one level, yet retain their original form or identity at another (lower) level.

Wong (2006) critiques Humphrey's (1997) notion of fusion emergence, and proposes two types of emergent laws, referred to in *Premise 1* as trans-ordinal laws. Firstly, *manifestation laws* codify the conditions (both qualitative and quantitative) under which emergent properties appear. Secondly, *behavioural laws* characterise the behaviour of emergent properties. In contrast to Kim's (2008) causal exclusion thesis, which maintains that there can only be one complete and wholly independent causal explanation for any given event or sequence of events, both manifestation laws and behavioural laws may provide causal explanations. Lawson (2013, p. 287) stresses that an emergent entity cannot impact its own parts; it can only act through them. By contrast, the organised structure that emerges can causally affect the various components. Therefore, relational organisation is a causal feature distinct from the global powers of an emergent system. In relation to marketing, researchers recognise the importance of relational organisation in understanding brand value (Barney, 2014; Merz, He, & Vargo 2009). Merz et al. (2009) state that not only is brand value co-created through isolated dyadic relationships between the firm and its customer, but also through network relationships and social interactions among the service ecosystem of all stakeholders.

This argument highlights the relational nature of emergent properties. While a focus on the production of effects is central to the notion of what a resource is in S-D Logic, in that: "... essentially, resources are not, they become" (Vargo & Lusch, 2004, p. 2), and resources are valuable because they connect actors (Chandler & Vargo, 2011), there is very little guidance in the marketing literature on this process of becoming. As Wieland et al. (2012) point out, service exchange enables not only access to resources, but allows the creation of new (and exchangeable) resources in the process. In other words, resources become as a result of their relationships to other resources. This process is what DeGregori (1987, p.

1243) terms resource enhancement; it is not that the base resource has changed, but that "... ideas, skills, and behaviour had, and these literally created the resource."

Murphy (2006) sees downward causation as a selection among lower-level processes on the basis of higher-level supervenient properties which are causally irreducible. Examples of such intentional mental properties include the formation of attitudes, mental images, and perceptual experiences – all of which have reference to some 'thing', and are representational in nature. They rely upon the relations between people themselves (their intrinsic nature) and their environment, and such relations may be both historical and/or social. Similarly, Silberstein (2006, p. 205) notes that "... mental properties emerge because one of the capacities of emergent systems is to help generate new emergent systems". That is, it involves the creation of stable patterns over space and time.

This conclusion has implications in S-D Logic for resourceness, defined as "The quality and realization of potential resources through the process of human appraisal and action which then transforms potential resources into realized resources" (Lusch & Vargo, 2014, p. 121). It implies that the quality of a resource relates directly to the human appraisal and action made in relation to that resource, that this appraisal and action is embedded in social systems, and that supervenience implies that even if the base resources do not appear to change in Heteropathic Resource Integration, higher-level relationships and structures may form as new emergent properties. This result is in stark contrast to Homopathic Resource Integration, where no such new properties are created. Thus, Heteropathic Resource Integration literally increases resourceness. Therefore:

Premise 1 – Corollary 3: *The new emergent properties resulting from Heteropathic Resource Integration can have feedback effects on lower-order resources through their*

relational organisation (i.e. Heteropathic Resource Integration allows for downward causation but without causal reduction).

2.1.4. Differentiation: the dialectic of structure and agency

The relationship between structure and agency is fundamental for much theoretical work in the social sciences. Agents and structures are not independent phenomena, but are intertwined, such that the structural properties of social systems (i.e. those giving form and shape to social life) are recursively organised by the agency of the actors within these social systems through their continuous flow of reflexively monitored conduct (Boland, 1996). Staber and Sydow (2002) explain that structures never determine action; rather individuals are engaged in structures that transform in the process of their actions. Individuals are active agents with the capacity to transform their setting through action (i.e. agency). However, by placing individuals within a social context, those contexts constrain their individual actions, and unintended consequences may result (Giddens, 1984).

This dialectic of structure and agency plays an important role in the creation and maintenance of new emergent properties. As Elder-Vass (2006) contends, on the one hand causal mechanisms may account for the creation of the new emergent properties that result from Heteropathic Resource Integration (termed morphogenetic causal mechanisms; Archer, 1995). In systems theory this positive or reinforcing feedback may produce exponential growth (e.g. compound interest generated on a monetary investment) or decay (Mingers, 2014). On the other hand, morphostatic causal mechanisms maintain the continuing existence of such properties and account for the stability of the organisational relations that constitute Heteropathic Resource Integration. In systems theory this negative (or balancing) feedback maintains some system variable at a constant level (e.g. the action of a float maintaining the level of a liquid in a system: Mingers, 2014). Thus both morphogenetic and morphostatic

elaboration (Archer, 1995) may be present in emergent processes, and must be differentiated. Morphogenetic elaboration establishes new emergent properties from resource integration events, and morphostatic elaboration maintains these properties through the resulting relational structures. The implication for value co-creation in S-D Logic is that Heteropathic Resource Integration may allow the creation of new emergent properties, however if there is no supporting structure in place, they may not remain stable for long enough to have an effect.

This distinction between creation and maintenance highlights another feature of emergence, that of *disemergence*, or "... the decay, demise or disjoint detachment of the higher-order level" (Bhaskar, 2008, p. 50): new emergent properties may also require maintenance. Thus the creation and maintenance, or lack of maintenance, of new emergent properties forms the dialectic of presence and absence, of emergence and disemergence (Morgan, 2007). Emergence may be possible because of the absenting of constraints (Bhaskar, 2008), and thus the positive presence of new emergent properties may co-exist with the negation (or absence) of constraints that prevent those properties from existing, or allow them to succumb to disemergence through lack of maintenance. This view reflects Lusch and Vargo's (2014) belief that in the activation process of resource integration it is necessary to overcome resistances or barriers that prevent or stifle resourceness. They state that: "The growth of resourceness is generally about the history of human civilization, the growth of human knowledge and skills, and thus the rise in the stockpile of potential resources" (Lusch and Vargo (2014, p. 125). Homopathic Resource Integration may take place precisely because of the constraints operating in a given social context, offering the unintended consequences (Giddens, 1984) of preventing or stifling resourceness. Thus, emergent processes are twofold, in that they may firstly create, and then maintain, new emergent properties and are subject to the dialectic of both presence and absence.

Premise 1 – Corollary 4: *The creation (morphogenesis) of new emergent properties (events) and the maintenance (morphostasis) of new emergent properties (structures) are non-identical (i.e. differentiation is present in Heteropathic Resource Integration) and these events and structures are subject to the dialectic of presence and absence.*

Insert Table 1 here

Table 1 provides a summary of the characteristics of Heteropathic vs. Homopathic Resource Integration. We now examine the notion of essentialism, its relationship to emergence, and how the appraisal of value may be related to new emergent properties created as a result of Heteropathic Resource Integration.

3. Essentialism, emergence, and the appraisal of value

This section explores notions of essentialism and how they relate to the definition of Homopathic vs. Heteropathic Resource Integration. Co-creation practice styles (and how they relate to desired outcomes such as quality of life) uncovered by McColl-Kennedy, Vargo, Dagger, Sweeney and van Kasteren (2012) illustrate this discussion to make the conceptual work and constructs more accessible, to examine causal relations, and to show how they may operate in a particular context (Siggelkow, 2007). As the case centres on the co-creation practice styles of individuals, this section considers resource integrators as individuals. However, note that resource integrators also could be organisations, institutions, or nonhuman actants. We start by summarising the healthcare co-creation practice styles case, and then use this to understand the concept of essentialism and its relationship to resource integration, emergence, and value co-creation.

3.1. Co-creation practice styles; an illustrative case example

In identifying co-creation practice styles, McColl-Kennedy et al. (2012, p. 372) identify patterns of difference and similarity in healthcare patients between the roles they adopt, the interactions they nurture, and the activities they engage in. Examples of such activities include cooperating, collating information, combining complementary therapies, co-learning, changing ways of doing things, connecting, co-production and cerebral activities. They recognise that different individuals might choose or have the ability to become involved in the co-creation of value processes in different ways. So, while choice and ability may help to define the characteristics of different healthcare customer styles, it does not offer a constant-conjunctive relationship between customer practice styles and desired outcomes. McColl-Kennedy et al. (2012) note that it is not only access to these resources that influences healthcare outcomes, but the way in which these resources relate to the activities that the individual undertakes, the interactions they engage in with others in the service network, and the role they adopt in relation to this resource integration process. These contingent factors help to explain the differences in co-creation practice styles.

McColl-Kennedy et al. (2012) identify five different co-creation practise styles according to the configuration of these roles, activities, and interactions. First, the Team Management style demonstrates high performance (or doing) of activities, numerous and varied interactions with others in the service network, and role perceptions in which they assemble and manage the healthcare and other actors as a team. Second, the Passive Compliance style demonstrates a low level of activities, a low number of interactions with others in the service network, and role perceptions of compliance with the directions of the healthcare providers. Third, the Insular Controlling style demonstrates a high level of activities but low number of interactions with others in the service network, and their perceived role is one of controlling

from a distance. Fourth, the Partnering style demonstrates a moderate level of activities and interactions with others in the service network, and a belief that their role is to act as a partner with the healthcare providers. Finally, the Pragmatic Adapting style is characterised by relatively low levels of activities and a high number of interactions with others in the service network, and a belief that their role is primarily one of adapting to their changed circumstances following diagnosis.

Using the definition developed by Cohen, Hassan, Lapoint and Mount (1996), McColl-Kennedy et al. (2012) conceptualised a patient's quality of life as: (1) beliefs about their control over life, its meaningfulness and worthwhileness; (2) the help and support available to them, and (3) their physical symptoms. McColl-Kennedy et al. (2012) found that the practice style of the healthcare customer had a significant relationship with the consequential health outcome and quality of life. They found that those with a Team Management or Partnering style had a relatively higher quality of life than those with a Passive Compliance or Insular Controlling style (who had a relatively low quality of life) or a Pragmatic Adapting style (who had a moderate quality of life). How did their co-creation practice styles account for this? The concept of essentialism and its relationship to emergence might inform this question, and this illustrative case example can show how Heteropathic vs. Homopathic Resource Integration might explain these results.

3.2. Essentialism and practice styles as dispositional properties

The results of McColl-Kennedy et al. (2012) seem to indicate that there is an essential difference between the resource integrators that might account for their differing co-creation practice styles. The essentialist debate is long standing in the emergence literature: what does the term 'essentialist' mean, and how does it relate to emergence? "An argument can be classified as essentialist if it holds that an essential property yields explanatory knowledge of

how individuals, groups, institutions, structures, etc., operate" (Cruickshank, 2007, p. 180). Sayer (1997) argues that a distinction should be made between forms of essentialism which are reductionist and deterministic, and those that are relational. He maintains that recognising the existence of structural relations which have features essential to them (i.e. structural/causal relations that operate in open systems) is not the same as reductionist and deterministic views of essentialism. Essentialism is a useful concept because "... we still need to distinguish classes of objects and identify causal powers which enable and constrain what those objects can do" (Sayer, 1997, p. 453), and he recognises that while things necessarily tend to act in the way they do, the circumstances in which they act introduce contingent factors. Thus, according to Sayer (1997, p. 457) "... essences do not capture the basis of every aspect of an object, but merely highlight that a specific property is essential or necessary for some specific behaviour or outcome to take place."

In understanding essential properties, Groff (2013, p. 213) makes a distinction between dispositional and categorical properties. The identity of dispositional properties depends on what they dispose their bearers to do, whereas the identity of categorical properties depends on what they are. Humans have variable powers that can be gained or lost over time, and which gives them the power to change their own dispositional properties, an essential property known as agency (Ellis & Lierse, 1994). As such, they have the dispositional power to co-create and appraise value. Therefore, reflecting its premise of phenomenological determination of value by resource integrators, in S-D Logic emergence (and the associated new and unique properties that result from it) or summation (the aggregation of resource properties) are fundamental processes leading to the existence of value and its assessment.

However, dispositions may not show themselves all of the time but may be subject to conditions, and might only be observable under certain circumstances. For example, someone who speaks French may not do so all the time, or at this moment, but may do so if they are on

holiday in Provence where French is the main language spoken. Therefore, context is an important feature of resource integration processes (Ellis, 2006). Grönroos and Voima (2013, p. 138) stress the importance of context, whether social, physical, temporal and/or spatial, as a determinate of the experience of value-in-use.

Mumford (2013) suggests a classification based on disposition to behave: "There is no mystery why all electrons or other kinds of things behave in a certain way. It is because they behave that way that things are members of that kind." (Mumford, 2013, p. 16). The value co-creation practice styles featured in the illustrative case above show that resource integration processes are not simply a pre-determined outcome based on some (categorical) essential quality, but that they can happen by design, "... as the intended outcome of intentional intervention by purposeful actors" (Smith, 2010, p. 29), and in the case of emergent resource integration processes in particular, are "... significantly constituted through rationality, not merely composition" (Smith, 2010, p. 30).

In the natural world, instances of emergence occur that do not require intentional intervention. These natural processes are what Polanyi terms a passive boundary condition (Clayton, 2006, p. 16). In the realm of the social, where features that arise out of and depend necessarily upon human interactions take place, such features are as real and objective as those of any other domain, having their own irreducible causal powers (Lawson, 2013). Thus, social reality is an emergent form of system or organisation. This embeddedness implies processes of interrelationship and coordinated interaction in a system of systems. Polanyi terms these active boundary conditions in that they actively shape the outcomes in a top-down manner (Clayton, 2006, p. 16).

Ellis (2006, p. 96) maintains that properties such as intelligence, affective evaluations, agency, rationality, self-understanding, self-esteem, and mutual recognitions are emergent qualities that entail the full depth of humanity. These new emergent properties, which result

from Heteropathic Resource Integration, enhance service ecosystem viability in two ways: through facilitating compatibility in the service ecosystems by aligning elements such as attitudes, beliefs and actions (i.e. consonance), and through facilitating the harmonious interactions of system components (i.e. resonance; Wieland et al., 2012)

While each of the five practice styles identified by McColl-Kennedy et al. (2012) may offer insights into how healthcare customers differ in terms of their actions, roles, and interactions (which reflect their dispositions to behave), they are not prescriptive. However, a twofold approach, looking at both the dispositional properties of the resource integrator and the conditions under which the resource integration takes place, may help explain value co-creation. The dispositional properties of resource integrators, which conform to behavioural laws (Wong, 2006), characterise the behaviour of emergent properties. Thus the activities in which patients engage, the interactions that they nurture, and the roles that they adopt constitute behavioural laws.

This approach, however, is subject to manifestation laws (Wong, 2006), which codify the conditions under which emergent properties appear. For example, societies where healthcare provision is widely available would see the emergence of different value co-creation activities (and thus practice styles) than in those where healthcare expertise is scarce. Because both the roles that are available to an individual and the interactions that they are able to nurture, are subject to the structural and cultural features of their environment (Archer, 1995), they would form the manifestation laws under which healthcare patients operate. Thus, while the disposition of a healthcare patient may be to engage in certain activities (behaviour laws), these are subject to contextual and contingent factors. Those with a Team Management or Partnering value co-creation practice style may be able to leverage their interactions and activities in ways that support a more positive and proactive role in their healthcare. Those with a Passive Compliance value co-creation practice style on the other hand may be

predisposed to reject such activities (behaviour laws), and thus forgo a more proactive role, even if the context is similar in terms of the interactions open to them (manifestation laws). Therefore, the second premise in relation to Heteropathic Resource Integration and value co-creation in service ecosystems is:

> ***Premise 2:*** *The dispositional properties of resource integrators (i.e. behavioural laws), together with relevant contextual and contingent factors (i.e. manifestation laws), will form the basis of the value co-creation practices that lead to either emergent or summative resource integration processes, producing either Heteropathic or Homopathic Resource Integration, respectively.*

3.3. Emergent properties and value appraisal

Appraisal is an important aspect of value co-creation, because it is a central feature of resourceness (Lusch & Vargo, 2014). As Grönroos and Voima (2013, p. 136) stress, the nature of value-in-use is the extent to which the appraiser feels better off (positive value) or worse off (negative value) through experiences. The concept of Heteropathic vs. Homopathic Resource Integration illuminates key differences between these value co-creation practice styles.

For the practice styles of McColl-Kennedy et al. (2012), those enacting an Insular Controlling practice style engage in similar activities to those enacting a Team Management style, with the exception of connecting (with family, friends, and others in the service network) in which they did not engage, and showing a more limited engagement in cerebral activities. The resources available to those with an Insular Controlling style may be similar to those available to members of the Team Management style (i.e. family, friends, and healthcare experts) but the Insular Controlling members do not utilise them, seeing their role

as one of controlling their healthcare from a distance and not sharing their feelings and problems with others. This approach puts constraints on the quality-of-life outcomes they might experience, as their interactions are largely superficial and tend to be self-focused (McColl-Kennedy et al., 2012). This practice style thus represents a simple aggregation of resources, where the resultant 'whole' is a simple aggregation of the parts (Homopathic Resource Integration), and which provides fewer, if any, new emergent properties in their quality of life. Quality-of-life aspects such as psychology (moderately negative), existential (low positive), support (low positive) and physical (low to moderately negative) demonstrate a relative lack of resourceness compared to Team Management members (McColl-Kennedy et al., 2012), largely because they do not engage in open communication and collaboration with others but prefer to focus within themselves.

The contrast is more stark for the Passive Compliance member group, who demonstrate a real lack of activities (cooperating and collating information only) and a very low level of interactions with others. Their overwhelming desire to comply passively means that while they may assemble resources (such as information) and cooperate in compliance with their treatment, they simply combine resources (i.e. instructions and advice from medical staff only), with little evidence of resource integration processes based on emergent relations and resulting in new emergent properties. They represent the working of homopathic intra-ordinal effects and laws, in which the effects are summative, characterised by constraints that keep the new emergent properties of well-being and quality of life absent (*Premise 1*).

By contrast, those with a Team Management style build complex and interconnected relations between their actions, interactions, and perceived role that results in the emergence of more positive and stronger aspects to their quality of life. Their practice style demonstrates Heteropathic Resource Integration, and facilitates the creation of new emergent properties through the working of heteropathic trans-ordinal effects and laws (*Premise 1*). This outcome

is not the result of any one particular action or interaction, but arises from novel and complex interrelationships among these resources. This improved quality of life cannot be reduced to a simplistic summation of their various activities (i.e. it is non-reductionist: *Premise 1 – Corollary 1*), yet these activities are reliant (i.e. supervenient: *Premise 1 – Corollary 2*) upon their perceptions of the world and of what they understand will provide them with positive value. Through complex interrelationships among their activities, they attempt to create more stable patterns over space and time that they believe will improve their health. In other words, they have positive feedback effects on lower-order resources through their relational organisation (*Premise 1 – Corollary 3*). This approach reflects a systems viability view of value co-creation, in that an increase in the viability of the system (i.e. its sustainability and well-being) is what is of value (Wieland et al., 2012). It also demonstrates how these complex interrelationships allow the positive presence of new emergent properties which co-exists with the absence of constraints that would prevent those properties from existing (*Premise 1 – Corollary 4*). Heteropathic Resource Integration has increased the resourceness of the resources available.

While the implication in the work of McColl-Kennedy et al. (2012) is that these new emergent properties (i.e. changes in quality of life) were largely positive for those that engaged in Heteropathic Resource Integration, they need not necessarily be so. It is entirely possible that negative new emergent properties could arise. As DeGregori (1987, p. 1260) notes: "Since we have described the process as one of emergent evolution, then, there are emergent possibilities that we cannot predict. Further, if the thesis is held true that we create the conditions for our existence, it is equally true that we can destroy the conditions of our existence."

The differences in the quality of life that emerge from the value co-creation practice styles identified by McColl-Kennedy et al. (2012) thus become important factors in assessing value.

Those with a Team Management or Partnering style may see evidence of higher quality of life than those with an Insular Controlling or Passive Compliance style. The new emergent properties that account for this (i.e. more positive experiences in relation to psychological, existential, support, and physical symptoms) clearly provide them with positively assessed value, as these new emergent properties motivate them to engage in the activities, interactions, and role enactments that help make their emergence possible. As McColl-Kennedy et al. (2012, p. 385) note: "Even though customers may be provided with similar value propositions, they may choose to undertake different types of activities and integrate resources in different ways." Those with a Team Management or Partnering co-creation practice style have greater resourceness than the other practice styles observed.

Therefore, the emergent properties of resource integration (or indeed the lack of them) themselves become the focus for the value appraisal of the resource integrators. This implies that resourceness in value co-creation (and the appraisal of value itself) relates to the *new emergent properties* that result from Heteropathic Resource Integration. For Homopathic Resource Integration, the lack of such new properties constrains such value appraisal, and therefore limits resourceness. For resource integrators, their ability to enhance resourceness stems from their emergent properties of intelligence, affective evaluations, agency, rationality, self-understanding, self-esteem, and mutual recognitions. Thus, the third premise in relation to Heteropathic Resource Integration and value co-creation in service ecosystems is:

> ***Premise 3:*** *The new emergent properties resulting from Heteropathic Resource Integration provide the focus of the value appraisal of resource integrators (i.e. resourceness and value co-creation relates to these new emergent properties).*

4. Conclusions

This paper utilises the concept of emergence to define and understand two types of resource integration: Heteropathic and Homopathic Resource Integration. Using this concept resource integration may or may not lead to new emergent properties, and resourceness and the assessment of the value co-created by resource integrators relates to the presence or absence of these new emergent properties.

Several key features distinguish Heteropathic Resource Integration in particular, and these relate to our understanding of resource integration and value co-creation in S-D Logic. First, non-reducibility implies that base resources alone may not account for our understanding of value co-creation processes, emergent new properties may be present that need to be taken into consideration. Second, the stratified nature of Heteropathic Resourch Integration and its relationship to the lower-level basal resources that support it implies that it may result not only in perceived value for a specific beneficiary, but also for the wider system as a whole, and this value co-creation process is subject to specific spatio-temporal conditions. Third, the presence of feedback loops implies that the quality of a resource directly relates to the human appraisal and action made in relation to that resource, that this appraisal and action is embedded in social systems, and that supervenience implies that even if the base resources do not appear to change in Heteropathic Resource Integration, higher-level relationships and structures may form as new emergent properties. This view is in stark contrast to Homopathic Resource Integration, which creates no such new properties. Thus, Heteropathic Resource Integration literally increases resourceness. Finally, the differentiated nature of the creation and maintenance of new emergent properties implies that even if new emergent properties arise, if there is no supporting structure in place they may not remain stable for long enough to have an effect. In addition, it is necessary to overcome resistances or barriers that prevent or stifle resourceness, as Homopathic Resource Integration may take place precisely because

of the constraints operating in a given social context, offering the unintended consequences (Giddens, 1984) of preventing or stifling resourceness.

In S-D Logic, emergence (and the resulting associated new and unique properties) or summation (the aggregation of resource properties) are fundamental processes through which value comes to exist, and through which it is assessed. Specifically, the dispositional properties of resource integrators and the conditions under which the resource integration takes place, may help to explain value co-creation. For resource integrators, their ability to appraise value stems from their emergent properties of intelligence, affective evaluations, agency, rationality, self-understanding, self-esteem, and mutual recognitions. Therefore, the emergent properties of resource integration (or indeed the lack of them) themselves become the focus for the value appraisal of the resource integrators. Thus resourceness in value co-creation (and the appraisal of value itself) relates to the new emergent properties that result from Heteropathic Resource Integration. For Homopathic Resource Integration, the lack of such new properties constrains such value appraisal, and therefore limits resourceness.

5. Managerial implications

Several important implications for managerial practice arise from this work. (1) Not all instances of resource interaction result in resource integration. Therefore, managerial efforts should be directed mainly at opportunities to facilitate the integration of resources. (2) Making a distinction between summative and emergent relations is an important aspect of understanding and designing service systems. The emergent properties resulting from emergent relations have novelty and unpredictability as key features. Thus, managers need to look beyond the constituent components of the value proposition to the relations it fosters for value co-creators. (3) Heteropathic resource integration is conditional in time and space, so process features of service-for-service exchange are critical to understanding value co-

creation processes. (4) Heteropathic Resource Integration may result not only in perceived value for a specific beneficiary, but also for the wider system as a whole through consonance and resonance. Therefore managerial practice may wish to focus on creating opportunities to facilitate resource enhancement through encouraging Heteropathic rather than Homopathic Resource Integration. (5) Managerial actions directed at encouraging positive or reinforcing feedback (which may produce exponential growth) need to consider not only actions that help to establish emergent new properties from Heteropathic Resource Integration, but also how to support and maintain the existence of these properties through balancing feedback.

6. Further research

This study has a number of implications for future research in resource integration in S-D Logic. Firstly, how do specific features of Heteropathic vs. Homopathic Resource Integration inform our understanding of value and value co-creation processes? For example, how might the notion of stratification – in which a lower-level mechanism (such as psychological mechanisms) can explain higher-level phenomena (such as how groups enact practice) – help us to understand how individual phenomenological determination links to meso- and macro-level phenomena, and thus the causal efficacy of social structures? Emergent properties may have consequences above and beyond the individual actors involved in the resource integration process. If Heteropathic Resource Integration affects the wider service system(s), further research could clarify how such value becomes available to other actors. Another research area would be to examine how, given specific conditions, the spatio-temporal effects of higher-order resources influence lower-order (and perhaps non-integrated) resources? Finally, and fundamentally, if Heteropathic Resource Integration creates higher-level systems that have new emergent properties that are not reducible to their lower level of explanation, then how do we identify and examine these new properties?

References

Alexander, S. (1966). *Space, time, and deity*. New York: Dover Publication.

Archer, M.S. (1995). *Realist social theory: A morphogenetic approach*. Cambridge: Cambridge University Press.

Ballantyne, D., & Varey R. J. (2006). Creating value-in-use through marketing interaction: the exchange logic of relating, communication and knowing. *Marketing Theory*, *6* (September), 335–348.

Barney, J. (2014). How marketing scholars might help address issues in resource-based theory. *Journal of the Academy of Marketing Science*, *42*, 24–26.

Bhaskar, R. (1975). *A realist theory of science* (3rd ed.). London: Verso Press.

Bhaskar, R. (2008). *Dialectic: The pulse of freedom*, Oxon: Routledge.

Boland, R. (1996). Why shared meanings have no place in structuration theory: A reply to Scapens and Macintosh. *Accounting, Organizations and Society*, *21*(7/8), 691–697.

Broad, C. D. (1925). *The mind and its place in nature*. London: Routledge & Kegan Paul.

Chandler, J., & Vargo, S. (2011). Contextualization and value-in-context: How context frames exchange. *Marketing Theory*, *11*(10), 35–49.

Clayton, P. (2006). Conceptual Foundations of Emergence Theory. In P. Clayton, & P. Davies (Eds.), *The re-emergence of emergence* (pp. 1–34). Oxford: Oxford University Press.

Cohen, R., Hassan, A., Lapointe, B. and Mount, B. (1996). Quality of Life in HIV Disease as Measured by the McGill Quality of Life Questionnaire, *AIDS*, *10* (2), 1421-1427.

Cruickshank, J. (2007). Essentialism. In M. Hartwig (Ed.), *Dictionary of Critical Realism*, (pp. 180–181). London: Routledge.

DeGregori, T. (1987). Resources are not; they become: an institutional theory. *Journal of Economic Issues*, *21*(3), 1241–1263.

Elder-Vass, D. (2006). Re-examining Bhaskar's three ontological domains: the lessons from emergence. In C. Lawson, J. Latsis, & N. Martins (Eds.), *Contributions to Social Ontology*, (pp. 160–76). London: Routledge.

Ellis, B., & Lierse, C. (1994). Dispositional essentialism. *Australasian Journal of Philosophy*, *72*(1), 27–45.

Ellis, G. F. R. (2006). On the Nature of Emergent Reality. In P. Clayton, & P. Davies (Eds.), *The re-emergence of emergence* (pp. 79–110). Oxford: Oxford University Press.

Fyrberg, A., & Jüriado, R. (2009). What about interaction?: Networks and brands as integrators within service-dominant logic. *Journal of Service Management*, *20*(4), 420–432.

Giddens, A. (1984). *The constitution of society: Outline of the Theory of Structuration*. Chicago: Polity Press.

Groff, R. (2013). *Whose powers? Which agency?* In R. Groff, & J. Greco (Eds.), *Powers and capacities in Philosophy: The new Aristotelianism* (pp. 207–228). London: Routledge Press.

Grönroos, C., & Voima, P. (2013). Critical service logic: Making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, *41*, 133–150.

Humphreys, P. (1997). How properties emerge. *Philosophy of Science*, *64*, 1–17.

Kim, J. (2008). Making sense of emergence. In M. Bedau (ed.), *Emergence: Contemporary readings in Philosophy and Science* (pp. 127–154). Cambridge: MIT Press.

Lawson, T. (2013). Emergence and social causation. In R. Groff, & J. Greco (Eds.), *Powers and capacities in Philosophy: the new Aristotelianism* (pp. 285–307). London: Routledge Press.

Lewes, G. (1873). *Problems of life and mind: The foundations of a creed* (vol. 1). Boston, MA: Houghton, Mifflin and Co.

Löbler, H. (2013). Service-Dominant Networks: An evolution from the Service-Dominant Logic perspective. *Journal of Service Management*, *24*(4), 255–282.

Lusch, R., & Vargo, S. (2014). *Service-Dominant Logic: premises, perspectives, possibilities*. Cambridge: Cambridge University Press.

McColl-Kennedy, J., Vargo, S., Dagger, T., Sweeney, J., & van Kasteren, Y. (2012). Healthcare customer value co-creation practice styles. *Journal of Service Research, 15*(4), 370–389.

McLaughlin, B. (2008). Emergence and supervenience. In M. Bedau (ed.), *Emergence: contemporary readings in philosophy and science* (pp. 81–97). Cambridge: MIT Press.

Merz, M., He, Y., & Vargo, S. (2009). The evolving brand logic: a service-dominant logic perspective. *Journal of the Academy of Marketing Science*, *37*, 328–344.

Mill, J. S. (1843). *System of logic*. London: Longmans, Green, Reader, and Dyer.

Mingers, J. (2014). *Systems thinking, critical realism and Philosophy: A confluence of ideas*. New York: Routledge.

Morgan, J. (2007). Emergence. In M. Hartwig (Ed.), *Dictionary of Critical Realism* (pp. 166–167). London: Routledge.

Mumford, S. (2013). *The power of power.* In R. Groff, & J. Greco (Eds.), *Powers and capacities in Philosophy: the new Aristotelianism* (pp. 9–24). London: Routledge Press.

Murphy, N. (2006). Emergence and mental causation. In P. Clayton, & P. Davies (Eds.), *The re-emergence of emergence* (pp. 227–243). Oxford: Oxford University Press.

Peters, L. D., Löbler, H., Brodie, R. J., Breidbach, C. F., Hollebeek, L. D., Smith, S. D., Sörhammar, D., & Varey, R. J. (2014). Theorizing about resource integration through service-dominant logic. *Marketing Theory*, *14*(3), 249–268.

Sayer, A. (1997). Essentialism, social constructionism and beyond. *Sociological Review*, *45*(3), 453–487.

Siggelkow, N. (2007). Persuasion with case studies. *Academy of Management Journal*, *50*(1), 20–24.

Silberstein, M. (2006). In defence of ontological emergence and mental causation. In P. Clayton, & P. Davies (Eds.), *The re-emergence of emergence* (pp. 203–226). Oxford: Oxford University Press.

Smith, C. (2010). *What is a Person?* London: University of Chicago Press.

Staber, U., & Sydow, J. (2002). Organizational adaptive capacity: A structuration perspective. *Journal of Management Inquiry*, *11*(4), 408–424.

Stanford Encyclopaedia of Philosophy, accessed online 10/05/2013 at: http://plato.stanford.edu/entries/properties-emergent/

Vargo, S., & Akaka, M. (2012). Value co-creation and service systems (re)formation: A service ecosystems view. *INFORMS Service Science*, *4*(3), 207–17.

Vargo, S., & Lusch, R. (2011). It's all B2B...and beyond: Toward a systems perspective of the market. *Industrial Marketing Management*, *40*(2), 181–187.

Vargo, S. L,. & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, *68*(January), 1–17.

Wieland, H., Polese, F., Vargo, S., & Lusch, R. (2012). Toward a service (eco)systems perspective on value co-creation. *International Journal of Service Science, Management, Engineering, and Technology*, *3*(3), 12–25.

Williams, J. (2012). The logical structure of the service-dominant logic of marketing. *Marketing Theory*, *12*, 471–482.

Wong, H. Y. (2006). Emergents from fusion. *Philosophy of Science*, *73*(3), 345–367.

Table 1

Summary of Heteropathic vs. Homopathic Resource Integration.

	Heteropathic Resource Integration	**Homopathic Resource Integration**
Fundamental nature ***Premise 1*** **and** ***Corollary 1***	The presence of emergent properties that are new and novel (i.e. have not occurred before) and unpredictable. Novelty and uniqueness are fundamental attributes of emergent properties, and are neither reducible to nor determined by the attributes of their base resources. The whole is more than the sum of its parts.	The resultant effects are identical to the sum of the effects of each of the base resources acting in isolation. Attributes are reducible to and determined by the attributes of their base resources. The whole is equal to the sum of its parts.
Types of Relations ***Corollary 2*** **and** ***Corollary 3***	Base resources form a compositional relationship that involves those components being organised in particular ways. This organising structure is a property of the emergent whole, but not identical to it.	Base resources form an aggregated relationship that involves a simple combination of those resources.
Operation of Effects ***Corollary 3***	Heteropathic effects: • Are dependent on both temporal and special processes. • Have feedback effects on their lower-order systems (i.e. their base resources). • Supervene upon their base resources (i.e. are dependent on them).	Homopathic effects which are non-conditional in space and time.
Operation of Laws ***Corollary 1*** **and** ***Corollary 3***	Trans-ordinal laws relate to events from which higher-level properties emerge from lower-level ones. Stratified. Manifestation laws codify the conditions under which emergent properties appear; behavioural laws characterise the behaviour of the emergent properties.	Intra-ordinal laws relate to events within an order and are thus 'flat' or non-stratified.
Differentiated Processes ***Corollary 4***	Differentiated processes of creation and maintenance (morphogenesis and morphostasis) explain the presence and/or absence of new emergent properties. Emergence is characterised by 'the absence of absence' in which the absence of constraints allows new properties not only to emerge, but to be maintained or to become subject to disemergence.	May take place because of the constraints operating in a given social context, offering the unintended consequences of preventing or stifling resourceness.

Appendix

Glossary of terms.

Term	Definition	Source
absence	Real determinate negation or non-being. It can encompass 'never existed anywhere anytime' to the change or distanciation of something that once did exist.	Bhaskar (2008)
basal loss	Where base resources go out of existence in producing higher- level emergent properties.	Humphreys (1997)
base (or basal) resources	Resources that form the basis for resource integration processes.	Stanford Encyclopaedia of Philosophy (2013)
categorical property types	Properties as the manifest qualities of an entity (i.e. what they are).	Groff (2013)
disemergence	The decay, demise or disjoint detachment of new emergent properties. The process of begoing, or of ceasing to exist.	Bhaskar (2008)
dispositional property types	Properties that account for what an entity is able to do.	Groff (2013)
emergence	The process of constituting a new entity with its own particular characteristics through the interactive combination of other, different entities that are necessary to create the new entity but that do not contain the characteristics present in the new entity. The emergent whole is more than the sum of its constituent parts.	Smith (2010)
emergent properties	The entities, structures, totalities, concepts, qualities, capacities, textures, mechanisms, etc. generated through emergent processes.	Bhaskar (2008)
essentialism	Where an intrinsic property yields explanatory knowledge of how something (i.e. individuals, groups, institutions, structures, etc.) operates.	Cruickshank (2007)
Homopathic Resource Integration	Processes of resource integration based on homopathic effects, in which the total effect of several causes acting in concert is identical to the sum of the effects of each of those causes acting alone.	Mill (1843)
Heteropathic Resource Integration	Processes of resource integration based on heteropathic effects, in which the joint action of multiple causes acting is not merely the sum of effects of the relevant causes.	Mill (1843)
intra-ordinal laws	Laws which relate to events within the same order or strata.	Stanford Encyclopaedia of Philosophy (2013)
morphogenetic elaboration	The processes of change resulting from the interplay between structure and agency that shapes and re-shapes society and gives society its form.	Archer (1995)
morphostatic elaboration	The processes that maintain society's continuing existence and account for the stability of those features established by morphogenetic elaboration.	Archer (1995)

presence	The positive bipolar to absence. That which exists.	Bhaskar (2008)
resource integration	Where resource interaction results in either emergent or summative relations.	Peters et al. (2014)
resource interaction	The coming together of resources.	Peters et al. (2014)
resourceness	The quality and realisation of potential resources through the process of human appraisal and action which then transforms potential resources into realised resources.	Lusch & Vargo (2014)
stratification	The multi-tiered depth of being. The recognition that things have their own level of being and may exist within a larger nested, or laminated, system.	Bhaskar (2008); Mingers (2014)
supervenience	Where new emergent properties are dependent upon their lower-level base resources.	McLaughlin (2008)
system relational consonance	The compatibility between system elements.	Wieland et al. (2012)
system resonance	The harmonious interactions among components in the system.	Wieland et al. (2012)
system viability	The survivability and well-being of a system.	Wieland et al. (2012)
trans-ordinal laws	Laws which relate to events in which the higher-level properties emerge from lower-level ones.	Stanford Encyclopaedia of Philosophy (2013)