The Relevance and Applicability of Process Metaphysics to Organizational Research

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Process metaphysics (process philosophy) has been suggested as a route, to a more "process-based" approach to organizational studies, as opposed to a "substance-based" view said to be dominant in Western thinking - including most contemporary organizational researchers. This paper explores into some of the ideas of early 20th century process thinkers and provides an interpretation of some of the major work of Alfred N. Whitehead. The objective is to evaluate its possible relevance to modern organizational research. The paper argues that Whitehead's radical ontology - that was based on a generalization of quantum theory in physics - appears largely to have been refuted or disregarded by succeeding process philosophers. Furthermore, his epistemology is found to represent a process view on scientific knowledge creation taken for granted by most contemporary researchers. For different reasons, major elements of his theories do not appear to be directly relevant to efforts to advance organizational theory into more radical process based theories.

On the other hand, the paper argues that the early 20th century process thinkers – including Whitehead - offer a plurality of analytical conceptions that may serve as useful and inspirational contributions to further development of methods and perspectives to investigate into organizations, change and innovation processes. There are also particular approaches within the domain that have properties quite similar to some of those conceptions in process philosophy – like "sensemaking processes" as represented by Karl Weick and others, which may in particular benefit from exploring the area of process philosophy.

Introduction

The topic of organizational change processes - including those focusing on innovation processes - is central to organization studies. Like any other area of science there is a flux of new ideas, new conceptualizations and also new "re-discoveries" of old ideas that are offered to the debate on how to frame new research initiatives, how to improve our methods of investigation and how to conceptualize such a phenomenon as "organization" in order to further advance theory. This is all very good. However, in the wake of a number of creative suggestions and contributions, there is also a time for some critical evaluations and assessments.

In this paper I would like to address and to critically examine a particular strand of thought that has been suggested by several writers over the last few years, and that continues to attract interest, namely the idea that process philosophy in the tradition of early 20th century philosophers such as Alfred N. Whitehead, Henri Bergson and William James, can and should be productively applied to organizational research and theorizing.[1] The line of reasoning is also presented in brief by Van de

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[1] See, for example Chia R (1999) A Rhizomic" model of organizational change and transformation: Perspective from a metaphysics of change *British Journal of Management* 10: 209-227; Tsoukas, H, and Chia R (2002): "On organizational becoming: Rethinking organizational change", *Organization Science* 13/5: 567-582; Styhre, A (2004): "Rethinking knowledge: A Bergsonian critique of the notion of tacit knowledge", *British Journal of Management* 15: 177-188; Hernes, T and Bakken T (2006): "Organizing is Both a Verb and a Noun: Weick Meets Whitehead, *Organizational Studies* 27(11): 1-18; Carlsen, A (2006): "Organizational becoming as dialogic imagination of practice: The case of indomitable Gauls", *Organization Science* 17/1: 132-149; Bordum, A (2007): "Managing Innovation Potential: Revising Plato and Reading John Dewey as a Philosopher of Innovation Management", *Philosophy of Management*, vol 6, no 1.

Ven & Poole in their discussion of various ontological and epistemological positions underlying different methods for studying organizational change[2].

In particular Chia and Tsoukas have argued that our current theories of change are not sufficiently "process-based" to adequately capture the dynamics of change, and that the introduction of process metaphysics to organizational change theory represents an important and potent step forward. While they also acknowledge that there has indeed been a substantial amount of research based on "process views" within organizational research, with numerous references at least back to Cyert and March's book "The Behavioral Theory of the Firm", they essentially argue that even the most radical attempts (like that of comparing organizational process to improvisation in jazz) fail to advance process theory to a sufficiently radical level. Such radical insights, they claim, "will be drawn out *only* if their calls for greater attention to process lead to a consistent reversal of the ontological priority accorded to organization and change."[3] They then suggest a theory of "Organizational Becoming" as a foundational approach to understand "the pervasiveness of change in organizations".

The work by Styhre, Hernes & Bakken, Carlsen and Bordum are all interesting recent examples of work where conceptions inspired or derived from process thinking represented by various process philosophers (Bergson, Whitehead, James and Dewey respectively) have either been applied to empirical studies (Carlsen), to analytical comparisons with the work of prominent organizational scientists, such as Weick, along with further refinements of conceptions of language for organizational studies (Hernes & Bakken), or to analytical comparison and development of conceptions of knowledge and knowledge potential in organizations as well as in innovation processes (Styhre, Bordum). Tsoukas and Chia similarly draw inspiration and conceptions from Bergson and James. In particular they seem to share some of the enthusiasm for "intuitive" ways of experiencing "true insights" with those of Bergson, as opposed to the more analytical approach generally favoured in scientific inquiry.[4] All of these illustrates that at least at the conceptual level, these philosophers have something to contribute to organization and management studies. [5]

The Metaphysics of change

As a point of departure however, I will provide a few quotes from the interesting work presented by Chia.[6] He argues that:

> "..there has been little attempt to understand the nature of change *on its own terms* and to treat *stability, order* and *organizations* as exceptional states" (The author's italics).

Rather, he suggests to:

> "..draw on the relatively forgotten tradition of process philosophers to throw fresh light on to the true nature of change and to explore genuinely alternative approaches to the understanding of organizational change, renewal and transformation. It pits a *metaphysics of change* in which primacy is accorded to movement, change and transformation, against the still-dominant Parmedian-inspired *metaphysics of substance* which elevates stability, permanence and order."[7]

The process metaphysical approach is accordingly said to represent a potent as well as radical departure from dominant western thought in line with "Parmediean substance thought" said to be taken for granted by most organizational change researchers.

It is furthermore argued that such a radical departure from familiar modes of organizational theorizing has direct implications for our thinking about the management of organizations:

[2]Cf Van de Ven, A and Poole M S (2005): "Alternative Approaches for Studying Organizational Change", *Organizational Studies* 26(9): 1377 – 1404; There is a comprehensive literature within contemporary philosophy covering a wide range of topics addressed by Whitehead and the other process philosophers. The topics I have chosen to address here are limited to providing a brief overview of what is held by some of those others to be important aspects and at the same time that I assume are relevant to a discussion of its relevance to the contemporary discussion within organizational change theory. At the same time, it might serve as a brief introductory to those unfamiliar with Whitehead's process theory.

[3] Tsoukas and Chia: op cit p 570.

[4] ibid p 571.

[5] It appears that Rescher 's introductory book to Process Metaphysics (1996) has served as a mediating medium for a substantial chare of the new interest in process philosophy among organizational researchers.

[6] Op cit 1999

[7] ibid p210

> "If we follow the logic of this alternative *metaphysics of change* to its logical conclusion, it would imply that the *management* of change must, accordingly, entail, not the deliberate change oriented form of external intervention so much preferred by conventional organizational change theorists and practitioners, but the alternative *relaxing* of the artificially-imposed (that is culturally-inspired) structures of relations: the *loosening up* of organizations. Such a relaxing strategy will allow the intrinsic change forces, always kept in check by the restrictive bonds of organizations, to express themselves naturally and creatively. According to this understanding, therefore, change occurs naturally and of its own volition once the invisible hand of cultural intervention is removed." [8]

And later on Chia concludes that:

> "What this means is that "organizational change" is not something that needs deliberate intervention or orchestration. Instead, merely *relaxing* the deeply entrenched organizational and institutionalized habits, which keep "organizations" together and which enable them to be thought of as "thing-like", is itself sufficient to allow change to occur of its own volition. It is this "hands-off" attitude towards organizational change which is the implicit advocacy of this process metaphysical mindset." [9]

Hence, Chia suggests that a process metaphysical theory in a direct sense can be seen to inform the area of organizational change theory in a far reaching sense. It is held that it is possible to deduce particular theories about organizations directly from such a philosophy, and that it is possible to conclude something in particular that appears to have a fairly strong normative and instrumental character, for instance with respect to how managers should go about managing organizational change (or rather "not-managing") or how they should manage (or not-manage) organizations in more general terms. This, I will argue, is to draw out implications and assumptions far too far. It seems to me to represent a mode of arguing that is quite the opposite of what I believe was held to be a fundamental point in Whitehead's epistemology, a mode of arguing that Whitehead denoted "The fallacy of misplaced concreteness", which may be interpreted as the temptation to confuse something deduced from creative analytical conceptions (a purely mental process that extend from time and space constraints) with knowledge about something of actual existence in the empirical world.

To make my point here, I will have to provide an interpretation of some essential points in process theory. In doing so, I will concentrate on a discussion of Whitehead's cosmological[10] theory addressed with an emphasis on interpretations of the historical and philosophical context to where it was contributed at the time. Even though the references noted above rather concern some of the other process thinkers, I believe Whitehead's work is both fundamental and representative to the understanding of the tradition.

One of the major contributions by process philosophy, as represented by Whitehead, was that it offered a theoretical solution at the level of epistemology, to the historical conflict between rationalism and historical empiricism and their mutual inabilities to explain exactly how we may have certain/true knowledge in our minds about whatever of nature. Whitehead's revolutionary theory (at the time) was suggesting that we may not have absolutely certain or true knowledge, only asymptotically so, and that the uncertain ontological knowledge that we have, must result from the interaction of creative conceptions of mind with perceptions of things physically existing in time and space (that is nowadays referred to as "the empirical"). This interaction of conceptual thinking and perception of actual entities he called "prehension" - a wording that is somewhat unfortunate, as the word that has later come to be used for approximately the same epistemological phenomenon is rather "proposition."[11] That is: we can have knowledge about the actualities of the world in the form of "propositions", or "theories" or "hypothesis" that are constantly being attempted revised and can thereby overall be described in terms of an evolving knowledge process.

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[8] ibid p 211

[9] ibid p 225

[10] The word cosmology refers to a more constrained extension of the philosophy than the term metaphysics. In particular Whitehead's theory of God is not included in his cosmology, whereas God is included in his metaphysics.

[11] Leclerc, I (1990): "Whitehead and the Dichotomy of Rationalism and Empiricism", in Rapp, Friedrich and Reiner Wiehl (eds): *Whitehead's Metaphysics of Creativity*, State University of New York Press pp 14-17

Whitehead's ontological theory about "actual entities" is carried over to this "process epistemology", as the fundamental conception that also mental activities must be interpreted as subjected to evolutionary change over time and thereby contribute to the evolution of theory that constitute "what we know". Now, this Whiteheadian theory is not revolutionary anymore, as it is in fact embraced by the empirical sciences as the almost taken for granted understanding of what constitute modern scientific activities. Most of us nowadays tend to have such a process understanding of knowledge about actual phenomena, not a "fixed substance" like one. And, it should perhaps also be stressed here: Whitehead did not "invent" the way modern empirical sciences have essentially been conducted and interpreted through out the last century. He merely formulated a cosmological theory to explain the relationship between modern science practices, as they were, and an overall interpretation at the ontological and epistemological level of analysis.

A possible source of the apparent confusion in the wake of the new "re-discovery" of process philosophy, can possibly be found within Whitehead's philosophy itself, in the part of his theory where he attempted to generalize across all of the sciences as well as to the universe in its totality (apart from God), to a new and complete "process based relativity theory" which also included a new conception of space/time. He approached this ambition from the – at the time - new quantum theory in physics. In this part of his philosophy he suggested that "substances do not exist" apart from in the form of "micro events" that "prehend" into one another and that are everywhere connected to one another to form "societies of events" that come to represent what we perceive of as "the actual entities of the world"[12] – for instance a human being, a machine or an organization. The classical view of an atom was based on the principle that atoms cannot be cut up or broken into smaller parts, thereby constituting fixed substances as the ultimate micro foundation of all matters of the world. The new quantum theory broke "atoms apart" into collections of fluctuating processes that organized into relative stability by statistical regularities – that is, by regularities at the level of aggregated phenomena. What was usually deemed as a physical thing, a stable durable object, was itself based on nothing but a statistical pattern of processes.[13]

This is the fundamental point that Whitehead drew upon in his effort to provide a new theoretical basis to relativity theory and to reconstrue space-time as well as the conceptions of other physical and mental objects as being instances of "fragmentary individual micro-experiences". It is the basis for Whitehead's "epochal theory of time" or "atomic theory of time" - that might perhaps more precisely be denoted as a "quantum theory of time". However, there appears to be fairly broad consensus among process philosophers that this part of his theory was far too radical, and that it has not been verified by "our immediate experiences" outside of physics. In particular, it is not clear that Whitehead's representation of entities as we generally perceive of them at the level of everyday perception, has much to gain from being represented as "societies of fluctuating micro-events". Furthermore, the actual existence of Whitehead's microscopic "actual occasions" has not been proven. Hence, it tends to be refuted as a theory – or disregarded.[14] Reference to and application of Whitehead's radical ontological theory of becoming of actual entities, accordingly risks a bit of confusion when "translated" to, say, modern organization theory.

It is a striking impression from some of the literature on process philosophy as discussed within organization studies, that what for instance Whitehead apparently saw as a meta theory that incorporated all the sciences *as they actually were conducting their research* at the time (in particular in physics and biology) is found by some modern researchers to have both specific and radical implications for some particular area of research, which even is said to point away from those modes of modern research within that area in which it is dominantly thought of and conducted. I would accordingly like to address this paradoxical discussion by focusing on some of the different levels that the idea of process may be usefully derived and possibly applied to organizational change and innovation process studies; at the level of process metaphysics, at the level of analytical conception (the "idea of process"), and at the level of methods for conducting process studies.

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[12] Eslick argues that also Whitehead's actual entities are based on the idea of a unitary ultimate rigid entity as the fundamental building blocks for an ontological theory about nature. Hence, he points out that Whitehead is not really solving the problem of change. Eslick, L (1958): "Substance, Change and Causality in Whitehead", *Philosophy and Phenomenological Research,* 18: 503-13

[13] Rescher N (1996) Process metaphysics: *An introduction to process philosophy*. Albany, NY: SUNY Press p 98

[14] cf Rescher op cit, or Eslick op cit

What is process philosophy?

Nicholas Rescher has offered an introduction to the area of process metaphysics (or process philosophy)[15], and to the major philosophers associated with the tradition. He also introduces the overall perspective, basic contentions and a brief overview of the various areas of thought broadly addressed within process philosophy. Rescher states that a characteristic of metaphysics is to articulate ideational perspectives to provide a framework for understanding the world about us and our place within it. It need not be designed to compete with what is represented by everyday knowledge and scientific understanding, but it can – indeed, should – absorb and supplement them within one comprehensive and harmonious overarching perspective. Hence, by nature metaphysics at its best is integrative and illuminating across sciences, and process philosophy is said to have met considerable success with this regard.

According to Rescher, process philosophy can be characterized as theories that hold that process has *primacy* over things, that substance is subordinated to process, that things are simply constellations of processes. Or it holds that process has *priority* over substance, which implies that things are always subordinated to processes because processes inwardly engender, determine, and characterize the things there are. The opposite view is seen as represented by similar but opposite forms of "substance views". Of the two types of process thought, the one that holds that process has primacy over things is associated with "a strong" (Heraclitean) view. Whitehead's quantum theory of "actual occasions" is a theory within this category. The other type that holds that process only has priority over things, is referred to as the weak (Empedoclean) version.[16] It appears that Whitehead's refuted radical "quantum theory of actual occasions" is the major representative of the first type among the 20th century process philosophers, at least the one that is commonly referred to. "The strong view" with regard to the ontological status of process holding primacy over substance, has thereby possibly "lost" its core reference.

The most noted process philosophers of the early 20th century are the following: Charles Sanders Pierce, William James, Henri Bergson, John Dewey, Alfred N. Whitehead and Wilmon H. Sheldon. As their primary antecedents, Rescher points at Leibnitz and Hegel. In particular Leibnitz' early theory of "monads" (units) understood as "bundles of process activity" or "centres of force" that he saw as constituting the phenomena of the world rather than any sort of fixed substances, came to represent a particular influence on Whitehead's effort to expand quantum theory to a general ontology.[17] Hegel's dialectical conception of process appears to have been relatively more influential in Sheldon's later theory of bipolar tensions, or "creative polar opposites" in which the tension between opposites is seen to engender change processes.[18]

There are considerable differences between those philosophers associated under the process philosophy umbrella. A major kind of difference has its roots in what type of process is taken as paradigmatic. For instance, Whitehead saw physics as the paramount process type from where he generalized across other areas of science. Charles S. Pierce and Henri Bergson on the other hand saw biological processes as fundamental, whereas William James based his ideas on a psychological model. Sheldon, like Whitehead, took physics as fundamental, but rather electromagnetism than quantum theory. Another difference is that while Whitehead (being a mathematician for 40 years before he became a philosopher) articulated his theories in strict scientific terms, others – like Bergson – relied on intuitive reflection. These various process philosophers can accordingly not be seen as representing one "school of thought", but rather appear to be associated under an umbrella with a limited set of joint contentions. Neither can we say that any of them, in any dominant sense, saw themselves as part of a joint school of thought, even though for instance Whitehead in his introductory to "Process and Reality" wrote that:

> "I am also greatly indebted to Bergson, William James, and John Dewey. One of my preoccupations has been to rescue their type of thought from the charge of anti-intellectualism, which rightly or wrongly has been associated with it" [19]

If anything particular is common to all the early 20th century process philosophers, it is perhaps their relationship to evolutionary Darwinism, which had emerged as a fundamental scientific and

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[15] He also offers an extended bibliography on the tradition
[16] See Tsoukas & Chia and Hernes & Bakken opera cit; also Van de Ven, A and Poole M S op cit (2005
[17] Leclerc, 1990 op cit
[18] Rescher op cit p 24
[19] Whitehead, A N. (1978): *Process and Reality,* New York: The Free Press p xii

philosophical revolution at the time[20]. Process philosophy, in particular the Whiteheadian and the Bergsonian versions, represent particular solutions to the theological challenges associated with the unification of natural evolution with the creative role of God – in which a process view of "creation" for obvious reasons provided an attractive new set of propositions. All of them also tend to stress the primacy of activity over passivity and to draw on a range of associated factors such as change, creativity, innovation, time and so forth, while maintaining that these conceptions are basic to our understanding of the world.

It is also clear that process philosophers in the main do not deny things (substances). Rather they re-conceptualize them as manifolds of process.[21] On this basis it might as well be concluded that "the weak view" has reached some consensus among modern process philosophers, in the acknowledgment that the primary controversy between the process view and the substance view is rather based on conceptual than ontological distinctions, and accordingly is one of relative priority rather than of primacy.[22]

Whitehead's metaphysics of creativity in historical perspective

Whitehead stands out as the most influential representative of Process Philosophy – a reflection also of the impressive ambitions and creative intellectual contributions that he represented. I will now give some considerations to the work of Whitehead on the basis of an historical perspective on his work.

First of all, we need to understand Whitehead within his own historical and philosophical context in order to make sense of what kind of issues his theories were struggling to solve, and on that basis, of what we may take from it within the domain of organizational and management research. This is of course not an easy task, as there obviously are different interpretations of Whitehead's philosophy represented among philosophers. In the following I mainly draw from a brief presentation offered by Ivor Leclerc.[23] Furthermore, such an understanding also requires an account of the ontological foundations of the entire modern development of philosophy, where even a brief outline requires some space to elaborate.[24]

Rather than the claim for a linear line of dominance within western thought all the way back to the ancient Greeks as advocated by some, the route is probably better seen as one of occasional major shifts. One of these is represented by the rise of modern science and philosophy in rejection to traditional natural science and philosophy as represented by Aristotelian scholasticism. It emerged on a basis of what is commonly denoted "neoplatonism," that developed through the work of Augustine and Descartes and came to dominate in the sciences of the seventeenth century.

Whitehead's ontology as opposed to the ontology of "neoplatonism"

In his preface to "Process and Reality", Whitehead positions his cosmological work in relation to the following:

"In order to obtain a reasonably complete account of human experience considered in relation to philosophical problems which naturally arise, the group of philosophers and scientists belonging to the seventeenth and eighteenth centuries has been considered, in

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[20] Evolutionary biology has of course had a tremendous impact also on areas like in Organisational Theory (for instance in the Freeman and Hannan (1977) tradition) as well as within Economics

[21] Rescher op cit p 51

[22] Process philosophy has had its stronghold in the United States (Where also Whitehead conducted nearly all his philosophical work while at Harvard), in particular within the area of Process Theology where followers such as Charles Hartshorne, Paul Weiss, Lewis S. Ford and John B. Cobb Jr. have kept it vibrant. The establishing of the Society for Process Studies, the journal "Process Studies" and the "Center for Process Studies" in Clairmont California in the early 1970s appears to represent a vitalization of the tradition more broadly. It also appears to have been "rediscovered" in Germany in the latter part of the same decade, or perhaps rather translated from the US to German philosophers.

[23] Leclerc op cit

[24] For other historical accounts, see for instance Ford, L (1984): *The Emergence of Whitehead's Metaphysics,* Albany: State University of New York Press; Wulf-Gazo, E (1990): "Whitehead and Berkeley: On the True Nature of Sense Perception", in Rapp, Friedrich and Reiner Wiehl (eds): *Whitehead's Metaphysics of Creativity*, State University of New York Press; Lowe, V(1981): "Alfred North Whitehead: A Biographical Perspective" in Holz, Harald and Ernest Wolf-Gazo (eds): *Whitehead and The Idea of Process*, Verlag Karl Alber GmbH Freiburg/München

particular Descartes, Newton, Locke, Hume, Kant. Any one of these writers is one-sided in his presentation of the groundwork of experience; but as a whole they give a general presentation which dominates the development of subsequent philosophy…a careful examination of their exact statements disclosed that in the main the philosophy of organism is a recurrence to pre-Kantian modes of thought. These philosophers were perplexed by inconsistent presuppositions underlying their inherited modes of expression." [25]

Hence, Whitehead positions his "philosophy of organism" in clear opposition to what he perceived of as the dominant neoplatonist philosophy at the time. The basic ontological doctrine of neoplatonism is that what "is" must be immutable, which in the strictest sense was represented by the existence of God. However, since abstract representations of real entities ("forms") were also seen as changeless in themselves, they too were considered "beings" in this strict sense. In the traditional platonist view, forms in enaction constituted "soul" (thoughts), which entails that souls too were considered "beings". However, in the traditional view these "souls" were seen as being the principals of agency embodied in the physical as their acting rationales rather than "beings" in themselves. In the neoplatonist doctrine this idea of embodiment disappeared. All change (becoming) now pertained strictly to the physical, to the realm of nature, maintaining a strict distinction between the acting agency of the soul on the one hand, and the becoming of the physical on the other. [26]

This considerable modification that came to be introduced in the seventeenth century centred on a new interpretation of matter. In the classical view, matter pertained to the physical as the recipient of "form", and was having an ontological status that was contrary to that of form, namely that of "not-being". This interpretation gradually changed into an understanding where the physical was seen as constituted by matter alone – as opposed to the classical conception of the physical as composite of both form and matter. From now on, matter alone constituted "being" in terms of everything physical, where as the classical understanding of "form" evaporated. This turn is what constituted a distinct and gradually dominant "substance view" of the world.

Descartes was the first to appreciate fully the philosophical implications of this new theory of nature. Matter had become an ultimate. It was simply matter, being everywhere the same and thereby incapable of changing into anything else. Matter had become the ultimate "being" as opposed to its previous "not-being" status. Descartes also noted that qualitative categories no longer had any meaning in relation to matter. Hence, the category of quantity remained as the only relevant one – due to matter's extension in space. This permitted for the dominant role Descartes then gave to mathematics in the philosophy of nature. Descartes further recognized that the logical implication of this was a metaphysical duality of two separate "worlds of beings". In addition to the physical, there is the one constituted by souls (thinking, intellect). This metaphysical dualism profoundly affected subsequent philosophy, represented a complete breach with the traditional view of "soul" as an active force included in physical nature, representing the principle of life, of emotion and of agency. The physical had become passive – without any capacity to influence. Only "soul" was active. On the other hand, "soul" had lost all of its associations apart from the activity of "thinking" (intelligence).

All this carried through into subsequent philosophy through Locke, Hume and Kant, where it came to represent the foundation for both empiricism and rationalism in the 18th and 19th centuries, which later came to represent taken for granted presuppositions for late 19th and early 20th century process philosophers. It was this inheritance that Whitehead gradually opposed, in comparison to which he finally came to represent a renewal of metaphysical philosophy presented for the first time in his Gifford Lectures at Edinburgh University in June 1928, published in "Process and Reality" the year after.

In doing this he embarked on a theory of an indefinite plurality of ultimate beings that he termed "actual entities", inspired by both quantum theory in physics, evolutionary biology and Leibnitz' theory of "monads". However, where as "monads" were conceived of as neoplatonic souls, Whitehead's entities are not souls, but are rather bipolar conceptions of both physical and mental content - fundamentally similar to the Aristotelian view[27]. Whitehead maintained - as did

[25] Whitehead, op cit p xi
[26] Leclerc op cit p 2
[27] As argued by Felt Whitehead actually misinterpreted the Aristotelian conception of "substance" (Ousia), thereby causing some ambiguity on the side of Whitehead as to the interpretation of Arestotelian process

Aristotle - that the physical must be understood as "in a process of becoming", which entailed that the physical must be "acting". This acting at the level of ontology, he denoted "prehending".

Whitehead made a distinction between two kinds of acting; physical acting (physical prehending) and mental (conceptual) acting (mental prehending). Physical acting is conceived to be the acting of actual entities in reference to one or more other actual entities. Mental or conceptual acting however, is the acting of an actual entity with reference to "eternal objects". In the neoplatonist view, soul is "pure action", which is to say that it cannot be "acted upon" by other souls, which constitutes a purely subjectivist foundation for knowledge of data. Whitehead, on the contrary, maintained a necessary objectivism as to his "data", which he argued represent a necessary foundation for any claim to "scientific knowledge".

He explains his position on this in *Adventures of Ideas* where he points out that "for an actual entity to be an "object" (data) for a prehending actual entity (interpreter), necessitates the former being "given", which means that it is antecedent to the latter, affirming that thus an object must be a thing received, and must neither be a *mode* of reception or a thing *generated* in that occasion."[28] He clearly perceived of this "receiving" of the object of study (data) not as a passive situation, but one in which the data were also "acting" on the observer. This situation is what he referred to as "creativity", in which the emergence of a new reality results from the interactivity of the actual world with the new in the actual act of creating the new. This is what is essentially contained in his notion of "physical acting" and the "continuity of physical activity".

Whitehead's notion "prehension" can more precisely be understood as "interacting", and physical prehension can better be understood as "interactions among actual entities". This can be compared with his notion of "mental prehension" or "conceptual prehension" in which data are "eternal objects" (conceptual abstractions). Whitehead held that the pure mental or conceptual prehension is an autonomous act. It is not a "being acted upon" like physical prehension. It is a mental "grasping" or "conceiving" of the "forms" in abstraction as derived from their physical determination of actual entities.

He furthermore denoted this derivation a "conceptual valuation", which he then distinguished from another autonomous kind of mental act denoted "conceptual reversion". The latter is the conceiving of form which is "reverse" or "opposite" or "contrary" to that of conceptual valuation. It is by the power of "conceptual reversion" that possibilities divergent from those derived from the data become accessible, which provides the basis for explaining the concept of "imagination". Mental prehension is thereby not constrained by time and space, where as physical prehension is.

Whitehead refers to mental acting and physical acting as differences in kind, and does not ascribe to mental acting any independent ontological status, as did neoplatonism. He holds that the actual entities that have ontological status, require both kinds since both are needed for the understanding of nature, and neither is reducible to or derivable from the other. Hence, conceptions created by mindful thought must interact with "influential" data of whatever physically exists in time-space, in order for there to be any understanding of what is. The "influence" capability of such "data" results from the complex and interconnected creative mental and physical interactions given in their "processes of becoming". In line with this, the fallacy of misplaced concreteness refers to the tendency to claim knowledge about objects in the real world simply by deductions from what is contained in autonomous acts of mental reflection.

Whitehead's epistemology as opposed to epistemology of historical rationalism and empiricism

On the basis of this bipolar ontological theory of actual entities, Whitehead developed an epistemology that evaded severe difficulties in the epistemologies of historical empiricism and rationalism, namely the problem of the knowledge of nature. This problem had been a primary concern to historical empiricism. On the basis of the neoplatonist ontology, sensuous perception is purely a mental act, an autonomous act of the mind. In the mind this gave rise to "ideas" of sensation in terms of "qualities" that referred to the mind alone, not to material things (matter). Hence these "sensuous ideas" were essentially "universals" that could not be seen as particulars

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thinking. Felt, J (1985): "Whitehead's Misconception of "Substance" in Aristotle", *Process Studies,* (14/4): 224-236

[28] Whitehead, A N. (1933): *Adventures of ideas.* London: Pelican Books 8, 229.

within the world of ordinary things. In the historical empiricist theory there is accordingly no basis for any direct knowledge of physical things other than by inference, which led Locke to maintain that valid inference is possible, where as Hume did not, holding that there could not be genuine knowledge of nature – only a "probability" of such. [29]

Core to Whitehead's rejection of both the empiricist and the rationalist positions, was his view on two particular characteristics of traditional thinking; the idea of genuine knowledge as necessarily "intuitive", and the idea of knowledge as necessarily "certain". The conception of knowledge as "intuitive" derives from Plato's *noesis* of the forms. This corresponded with the neoplatonic doctrine of the soul and was essential to Descartes claim that knowledge is essentially "mathematical" - as the foremost example of knowledge as intuitive. The conception of "certain" is also taken from Plato, but changed significantly as a result of the neoplatonist interpretation. Plato held that knowledge (episteme) per se was "true" and thus "not false". This however, is significantly different from "certainty" because "certainty" rather refers to the thinking subject than to the definition of true knowledge per se. Descartes required this "feeling of certainty" on the side of the thinker, as the authorization of authentic "knowledge". This idea was then accepted by later thinkers of both rationalistic and empiricist orientation. To this Whitehead argued that we cannot know "what a thing is" by merely thinking of mathematical patterns or equations. On the contrary Whitehead insisted that empirical investigation is required for us to have knowledge of what is. Hence, Whitehead rejected both the conception that knowledge is "intuitive" in this sense, and the idea that knowledge necessarily had to be "certain." [30]

Whitehead accordingly maintained that genuine knowledge of nature necessitates the perception of physical entities. This however, required a different analysis of perception than that of the empiricists. Firstly, he rejected the presupposition of traditional thinking that vivid sensuous perception has the status of ultimacy (certainty required ultimacy). He held that perception is part of the physical and mental 'actings' of actual entities and hence cannot be ultimate, but rather may change along with new actings. He argued that the first requirement is to admit that there is a physical acting (or influence) by the perceived actualities on to the perceiver. This physical interacting does not alone constitute perception. So, the second requirement is that perception also requires mental acting by the perceiver. Knowledge accordingly, requires interacting between pure mental acting and physical interacting, an integration, or synthesis, of the conceptual and the physical.

This integration of mental acting and physical interaction is what constitutes a "proposition". This comes about as follows: Mental prehension refers to conceptions representing abstract potentiality, meaning they have a completely general reference to any actual entity. In a proposition, there is no such generality, as the mentally conceived conception is integrated with a particular actual entity (or several) physically received. Some particular mental conception is being "proposed" as the hypothetical definiteness for those actual entities. Given the distinction between conceptual valuations and conceptual reversion, the number of possible "proposals" is unlimited. This propositional integration, according to Whitehead, is the basis for all perception based knowledge of nature. That is to say: sensuous perception is not a direct intuition of physical things; it is a proposition about them. All thought related to the actualities of the world, must necessarily be propositional – or theoretical. [31]

Throughout the history of modern science, the view that scientific investigation and knowledge proceed by the method of hypothesis, propositions and hence "theory" has been gradually accepted, and also that perception of the empirical is related to analytical conceptions of mind. Whitehead's conclusion that scientific knowledge per se is "propositional" or "theory" is also generally accepted. It was the lack of adequate philosophical basis for this doctrine that was Whitehead's concern, not that any of the scientific activities within the empirical sciences at the time was not in conformity with his theory.

The relevance of process metaphysics to organizational theory

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[29] Leclerc op cit p11
[30] Whitehead ibid pp 12-13
[31] ibid p 15

Victor Lowe describes Whitehead as "one of the most quoted philosophers of our century – and one of the least understood."[32] At the very least his work is not easy to comprehend, in part due to the highly scientific form of his way of expressing himself, particularly in his original wording. I shall not claim that I have understood Whitehead entirely, as the outline above clearly depends more on my interpretation of those interpreting Whitehead, than it rests with any serious independent inquiry into his writing (assuming that while being a social scientist, it might be better to trust the evaluations of other philosophers than to try to become one). My essential point by drawing this outline of an historical evaluation of Whitehead's metaphysical theory, is to indicate that the appeal to early 20th century metaphysical theory in order to inform a more "fundamental", "genuine" or "true" process-thinking within organization studies, might possibly be flawed in several respects.

First, like any other phenomenon we study within the realm of the social, cosmological philosophy needs to be interpreted within its historical and theoretical context. To infer that written documents nearly a century old, and related to the contextually given understanding then, would present an idea in the same manner as the same documents indicate to us today, is likely to be inaccurate. To take a process perspective: the world has been moving on, and so have our conceptions and taken for granted presuppositions. It is for instance not evident that a focus on "microscopic" change, as advocated by Tsoukas and Chia[33] is more consistent with an overall process view than any other focus on level of analysis, at least if we assume that Whitehead's radical quantum theory of becoming is not supported. A major challenge in many empirical process studies is to provide reasonable accounts for the interactivity within extended - or large scale - change processes and to analyze the interactions of these with the micro-change processes observed at the narrowly observed organizational level. Micro-processes can hardly be adequately understood in isolation from the more extended and historical processes within which actors associate and shape the meaning of the particular local process.

Second, cosmological theory such as the one represented by Whitehead, is based on generalized interpretations of scientific practice as they were actually conducted at the time. It is fairly unlikely that such a theory represents a position from which to radically transform the way anyone of the particular sciences might go about doing their research – or that it should be expected to provide authoritative guidelines for such a change. At best, a metaphysical theory might illuminate in a comprehensive way, our understanding of what we in the broader sense, are doing.[34] Given the complexity and variety of the phenomena of the world, process metaphysics is more likely to make more salient the value of methodological and theoretical creativity and diversity in the processes of overall knowledge creation, than suggest the advocacy of some particular analytical approach to the study of empirical phenomena.

Third, the appeal to process metaphysics as represented by Chia and Tsoukas (in terms of reference to its ontology or epistemology as representing a source from where to deduct a particular, "true", "genuine" or otherwise far reaching "process theory" about what organizations in fact are) appears to be somewhat contrary to Whitehead's philosophy: any proposition or theory about such entities as "organizations" that we may perceive of empirically (that are not simply autonomous "mental conceptions") requires the interaction of "mental conceptions" and "physical interactions". Hence, according to Whitehead, a knowledge proposition or theory about organizations requires empirical investigation and analysis in order to be a proposition about some phenomenon in the world at all. To infer something in particular about organizations from the perspective of process metaphysics is neither "true" nor "genuine" theory, only creative analytical speculation.

The fundamental perspective on organizational change suggested by Tsoukas and Chia, is in short a version of Whitehead's analytical theory of "the becoming of actual entities". In addition they include conceptions of stabilization from categories and conceptions of recursive interaction.[35]

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[32] Lowe, Victor (1985): *Alfred North Whitehead: The Man and His Work, 1861 – 1900*. Baltimore: John Hopkins University Press. p 3

[33] op cit p 580

[34] An analogy with respect to the relationship between the physical sciences and Whitehead's metaphysics is offered by Friedrich Rapp (1990). Among other things he discusses why a highly successful area the physical sciences have not applied any Whiteheadian like conceptions of process.

[35] For stabilisation from categories cf Lakoff, G. (1987): *Women, Fire, and Dangerous Things*. Chicago University Press, and Johnson, M. (1993): *Moral Imagination*, University of Chicago Press; for recursive interaction cf

However, the process view that they present; that organizations constantly change and become ordered as a result of a multiplicity of change activities, is fundamentally based on an axiomatic analytical construct that forms a simple tautology. This can be illustrated in the following way: Assume a world with the existence of only two independent (non-related) processes that evolve into the future. If these two processes interact with one another, the outcome of such interacting by logical necessity will be different at all the different points of time that this might happen. Variable outcomes over time – and accordingly variable processes of change – are logically unavoidable when you introduce such an axiomatic point of departure, even limited to only two such independent and interacting processes. To generalize theoretical propositions about real world phenomena from a perspective where phenomena such as organizations result from continuous change activities is a logical deduction from the axiomatic point of departure. To support this logical deduction by picking a number of illustrations from the ethnographic studies literature and from organizational studies that have been conducting detailed studies of such change activities, does not add much empirical validity, because such a tautological concept can be applied to any phenomenon to produce a perfectly reasonable description that confirms the appropriateness of the perspective.[36] Most objects can indeed be described in an unlimited number of dimensions, of which this is certainly one. To identify such similarity does not refer to the context of empirical investigation, but rather to the context of conceptual justification.

Fourth, it follows from this, that direct inferences within the realm of organization theory from what – in the perspective of Whiteheadian epistemology - is in fact not a theory or a judgment of various theories about organizations, but simply an appeal to different mental conceptions, do not meet reasonable requirements for scientifically based claims to any sort of normative or instrumental implications onto the empirical field of the subject matter. This holds equally when evaluated from our general perceptions of the criteria for valid knowledge as represented within the sciences. Hence, the argument Chia advocates, that "

> ..if we follow the logic of this alternative *metaphysics of change* to its logical conclusion, it must imply that the *management* of change must, accordingly, entail, not the deliberate change oriented form of external intervention (..), but the alternative *relaxing* of the artificially-imposed structures of relation: the *loosening up* of organizations…..",

is not a theoretical proposition, but an incident of creative conceptual "reversion". Process metaphysics simply does not deliver theoretical implications like those suggested.

Finally, it appears that the reference to "a *metaphysics of change*" as what we now need to develop organizational theory as opposed to "the still-dominant Parmedian-inspired *metaphysics of substance* which elevates stability, permanence and order", leaves some room for further qualification. Possibly this description rather refers to the scientific context of the late 19th/early 20th century, more than it is an accurate characterization of present state of affairs. Rather than a metaphysics of substance dominating Western thinking from the times of the ancient Greeks, it could be that is was the neoplatonist view that came to dominate over the previous Aristotelian scholasticism somewhere in the 17th century, that brought a fundamentally new "metaphysics of substance" to Western thinking. Such a view is hardly dominant any more. As noted, Whitehead's opposing process metaphysics presented 80 years ago, is quite consistent with what I believe are taken for granted presuppositions regarding knowledge developments within the various sciences today – indeed also within the domain of organizational theory. I shall of course not deny that static conceptions and categories are widespread within organizational research. However, I will argue that an overall process view of *organizational knowledge* as well as of organizations is rather common, and also that organizational processes and the diverse ways we may study them, actually have become highly influential parts of the research area.

Since the time of the process philosophers, it is probably a fair characterization to say that philosophy at large has moved away from the kind of grand unification of science metaphysics similar to Whiteheadian philosophy, on the reasoning that the enormous generalizations they required led to a flexible looseness in wording and interpretation that was experienced as rather unproductive. A more pragmatic view that appreciated the diversity of the sciences emerged, bringing focus for instance on matters of language and on analytical issues in what is commonly

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Von Foerster. H. (1984): "On constructing a reality", in P. Watzlawick (ed.) *The Invented Reality*, W.W: Norton, New York, 41-61

[36] Tsoukas and Chia, 2002

referred to as "Philosophy of Science". This has grown into a diverse area of philosophy somewhat closer to each of the domains of the sciences. This turn - with the relative strong influence from philosophical pragmatism, is what may be seen to dominate an area like organizational change theory today, rather than, say, any metaphysics of substance. A return to cosmological philosophy as represented before the days of "the Philosophy of Science", is an interesting and possibly stimulating voyage, but not necessarily a productive one (in the pragmatic sense).

I have not found space here to further demonstrate that the part of Whitehead's ontology where he insists on a generalized quantum theory based on "micro-events" or "actual occasions" as the *only* foundation for existence of every phenomena in the world, is in fact refuted. There is a substantial literature on the topic, and I find that Rescher's explicit down-tuning of this part of Whitehead, could be seen as an indicative conclusion within an overall positive representation of process philosophy. I shall not decline from noting though, that merely the insistence on something particular constituting each and everything in the world (including time), appears rather counter-intuitive – at least within the context of a contemporary acknowledgment of a diverse foundation for science as a whole. Whitehead's insistence on such a unified foundational theory also appears to be inconsistent with other parts of Whitehead's own thinking, as outlined in this article. It is important to note that the amount of "creative" thinking and "word inventions" done by Whitehead to overcome the difficulties of this "impossible" theoretical venture, appears to have left a tempting bunch of "ingenious" citations (close to true poetry) that may at least in part explain why Whitehead is both one of the most cited and one of the least understood philosophers of the previous century.

Process versus substance view

What then, is there to be said about the particular debate over the "process view" versus the "substance view"? According to Rescher, the "substance view" is representing the "opposite view" that identifies what constitutes process philosophy in broad terms, as what it is not. Reference to those representing the "substance stance" however, is limited to P. F. Stawson's *Individuals,*[37] apparently with no further references to more recent work within this tradition. I believe it is not completely evident on the basis of Rescher's book, that the general impact of the process versus substance controversy carries a lot of weight today.

Given the Whiteheadian epistemology that is generally appreciated nowadays, the relevant "new" aspects that may be offered by historical process philosophy are rather to be found at the level of mental conceptions, among its diverse representations of "the idea of process" in the shape of analytical conceptions that may be applied as perspectives or analytical frameworks to analyze complex information given by empirical fields of investigation. As is evident from the work for instance by Stuhre, Hernes & Bakken, Carlsen, Bordum and also Tsoukas and Chia, process philosophy offers a stimulating plurality of such analytical constructs. Quite similar to the Whiteheadian understanding of knowledge creation, there is now a common view represented by phenomenologists and psychologists alike that the human brain tends to organize thinking by means of two different processes. One of them has to do with a certain kind of hierarchical framing that gives a particular perspective to the flow of information that is addressed. The other concerns the selection, organizing and analysis of the data (information), given the framework. Hence, the process view and the substance view can for the most part be perceived of as different analytical framings. To decide upon which of them hold priority over the other, does not seem to represent a productive issue in relation to an empirical science like organization studies. A call for studies that "treat stability, order and organizations as the exceptional states that need explanation rather than the instances of change"[38] is of course a viable and practical consequence of taking a process perspective seriously. Whether such studies produce better theories than those we already have, depends on what discoveries such approached leads to – discoveries that need to be more than what can be said by logical deduction from their axiomatic points of departure.

However, as is also evident from Rescher's presentation, "process thinking" is also based on contentions that serve as irrefutable underpinnings (tautologies) of what typically constitutes a paradigm. Hence, process philosophy is said to solve a number of theoretical problems at the level of crude logic that demonstrates its advantages over rival logical constructs. As such, it aspires as

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[37] Strawson P.F. "*Individuals: An Essay in Descriptive Metaphysics* 4th edition Methuen 1987
[38] Chia, 1999 op cit

one of the fundamental perspectives we may have, from where to derive further conceptions that may develop into methodologically unified areas of scientific inquiry. The lack of "definiteness" in the general characterization of what constitutes "process" however, is an obvious obstacle to the productivity of such a venture – for instance as compared to other axiomatic systems like "general equilibrium theory" in economics or "systems theory" in sociology. There is always the possibility that a logically well founded paradigm will rather produce ideology than actual knowledge, due to its impractical applicability to empirical investigations. However, at this point I believe the area of organizational research has seen some substantial progress recently, when it comes to advancing more operational conceptions of what constitutes a process and how it may be studied, as for instance represented by the introduction of "Chaos Theory", "Actor Network Theory" and other methodological conceptions, as for instance influenced from the area of Science and Technology Studies (STS).[39] Various others have emerged from case studies suggesting analytical conceptions inferred from narratives of observed processes[40] and from the "process of sensemaking" approach to organizational studies.[41]

Finally, the theoretical concept of "mental and physical interactional bipolarity" may indeed represent a particularly interesting point of departure for investigations into the dynamics of organizational change and innovation. This is the position most explicitly taken by Sheldon, however Whitehead – as we have seen – also makes considerable use of this construct in his theorizing on the nature of creative processes. He even points at the necessary bipolarity of the principle of process with the opposite principle of ordering which is commonly appreciated as the "dilemma of innovation" within the area of innovation management studies. One interesting feature with analytical conceptions based on a bipolar geometry is that these establishe a "free space for agency" by which to escape from "logical" determinism given by unitary conceptions. This is a particularly interesting feature within the social sciences where agency creates such a huge potential for variation in processes and outcomes that are otherwise also influenced by other kinds of tangible and intangible forces. The conception of bipolarity is what Hernes and Bakken explore in their analysis of the relationship between, and the mutual transformation of, nouns and verbs in organizational theorizing (the interrelatedness and bipolarity of verbs and nouns). It appears that perhaps some of the most useful contributions that we might draw from Whitehead relate to his sophisticated work on "prehension" understood as "mental and physical bipolar interactivities". The recent emergence and growth of various network theories in the area of innovation studies as well as within business strategy and logistics, appears to justify the appropriateness of such an analytical conception to management studies.

Alternative approaches for studying organizational change
There has been a substantial turn towards "process studies" in recent years. The seminal work by Van de Ven et al in the so called "Minnesota studies" represents but one major contribution. One of the interesting parts of their work, is that it introduces and draws on "chaos theory" in organizational and management research, which conceptually has some similarities with

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[39] See for instance Pickering (A. (1995): *The mangle of practice.* Chicago: University of Chicago Press; Giere. Ronald N. (1999): *Science without laws.* Chicago: University of Chicago Press; Kaufmann, Stuart (1993): *The origin of order.* New York: Oxford University Press

[40] Pettigrew, Andrew (1990): "Longitudinal field research on change: Theory and practice", *Organization Science* 1(3): 267-292, (2001): "Management research after modernism", *British Journal of Management* 12/Special Issue: S61-S70, and (1997): "What is a processual analysis?" *Scandinavian Journal of Management.* 13/4: 337-348; Nonaka, I. (1994): "A dynamic theory of organizational knowledge creation. *Organization Science* 5/1: 14-37; Langley, A (1999): "Strategies for theorizing from process data", *Academy of Management Review* 24: 691-710; Eisenhardt, K. (1989): "Making fast strategic decisions in high-velocity environments", *Academy of Management Journal,* 32: 543-576; Dansereau, F., F.J. Yammarino and J. C. Kohles (1999): "Multiple levels of analysis from longitudinal perspective: Some implications for theory building, *Academy of Management Review 24: 346-357*

[41] As represented by Weick, Karl E. (1995): *Sensemaking in Organizations,* Sage, Thousand Oaks, CA. Dutton, J. E. (1993): "The making of organizational environments: An interpretive pathway to organizational change" in L.L. Cummings, B.M. Staw (eds.): *Research in Organizational Behavior,* 15, JAI Press, Greenwich, CT: 1995-226; also Gioia, D.A. and K. Chittipeddi (1991): "Sensemaking and sensegiving in strategic change initiation. *Strategic Management Journal,* 12:433-448, and Weick, Karl E., Kathleen M. Sutcliffe and David Obstfeld (2005): "Organizing and the Process of Sensemaking", *Organization Science,* 16/4: 409-421

Whitehead's "quantum theory" drawn from physics, in the sense that "data" are seen as collections of fluctuating processes that may organize into relative stable patterns or identities by statistical regularities. The studies bring significant new insights into the particular aspects of processes that are captured by the "pattern seeking" analytical approach in combination with a systematic empirical methodology to obtain and analyze perceptual data across real time observations. Hence, chaos theory obviously has become part of the methodological repertoire of organizational process studies. How much closer to "true Whiteheadian process thinking" can you get?

I would also like finally to give a few thoughts to Van de Ven & Poole's[42] suggested typology and discussion of alternative research methods for studying organizational change which is based on their different ontological and epistemological positions in relation to process thinking.

Their call for plurality in methods on the basis that insights gained from different kinds of studies are fundamentally complementary to one another appears to be quite in line with a process view – at least in the Whiteheadian sense. The creative potential represented by the multiplicity of conceptions, studies and propositions offered, must be part of the basis for achieving future scientific progress – which is evidently an evolutionary process. This is also completely in line with an overall pragmatist conception, by which the various approaches will finally be evaluated in terms of their relative contributions to knowledge as valued by society at large. I also find that their classification and discussion of the various methods are illuminating and clarifying with respect to the contributions from each category of studies. Their discussion is also firmly grounded in an extended discussion of research methods within the area of organization studies – in particular since around 1990. As such, it represents a neat outline and an appropriate conclusion from a lengthy discussion.

Conclusion
This paper has attempted to explore into the debate within management and organization research on the suggested turn to a more fundamental process thinking by pulling directly from historical process philosophy. The ambition has been to bring more clarity to this debate regarding some of the basic characteristics of process philosophy, in order to illuminate and assess both constraints and potentials. The exploration of Whitehead's philosophy in this paper is not an attempt at a complete dismantling of his thinking, but aims at illuminating some of the challenges that raises from the call for more fundamental process thinking inspired from early 1900 process philosophy.

An overall conclusion is that the call for historical process metaphysics as represented by late 20th century philosophers such as Pierce, James, Bergson, Dewey, Whitehead and Sheldon to support a radical turn towards a more "true" or "genuine" process based approach to organizational research, is hardly as appropriate or productive as claimed by some. At the level of analytical conceptualization however, the philosophical tradition offers interesting and potentially useful contributions that deserve further exploration within management and organization research. This indeed includes elements of Whitehead's own work. Some of these elements offer particularly interesting conceptual contributions to organizational change and innovation process studies. As examples from other management researchers indicate, there might be even more to be harvested from the other process philosophers that I have not had the opportunity to investigate further in this article.

At the level of research methodology, the analysis is inconclusive at the specific level. However in the general perspective of process philosophy, methodological pluralism and creativity at the level of empirical science is supported.

It is also fair to conclude that Whitehead's epistemology is nowadays generally appreciated through out the empirical sciences – including of course management and organization research. There are of course instances still, by which someone appears to infer theory about empirical phenomena simply through logical deductions from higher order analytical conceptions. This – according to Whitehead – is to conduct "the fallacy of misplaced concreteness". It is to confuse the context of

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[42] Op cit 2005

analytical justification with the context of empirical investigation in the process of theory development.

Whitehead's ontology leaves a divided impression. On the one hand, his ambitious attempt to reinvent a radical new and unified cosmological theory of relativity on the basis of first and foremost "quantum theory" in physics, appears both to have been too radical and to have been refuted or at least disregarded by later process philosophers. The so called "strong" ontological view on the priority of process over substance thereby appears to have lost an influential advocacy. However, it appears that the "weak" view is consistent with what stands out as the most substantial contribution from Whitehead's philosophy to science theory, namely that this version adequately deals with the many different notions of "process" articulated in management and organizational studies and that the view also adequately deals with the general process of advancing management and organization theory. The other part of Whitehead's ontology where he outlines the principle of "creativity" by means of interactions within a bipolar conception of mental vs. physical interrelatedness, has a particular resonance within the numerous network-based theories of organizational and innovative activities across the management sciences. A more concentrated study of these Whiteheadian conceptions appears particularly interesting to "process view" studies as of today.

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