

HERMENEUTIC CONSISTENCY, STRUCTURED ONTOLOGY AND MEREOLGY AS EMBODIED IN FACET THEORY AND THE MAPPING SENTENCE

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ABSTRACT

Hermeneutic consistency is the property possessed by a reliable interpretation. In this essay we present a review of the work by Paul Hackett and his metaphysical explorations of the hermeneutic consistency and theoretical and empirical validity of using the mapping sentence for creating structural ontologies. We propose that the hermeneutic consistency of a structural ontology is a product of both the ontological categories and their mereological interrelationships. The mapping sentence grounded within facet theory is advanced as a structured ontology and mereology and a mapping sentence for the validity of hermeneutic consistency of the mapping sentence is proposed as a philosophical ontology.

INTRODUCTION

From its inception and development in the work of Louis Guttman in the 1940's (Guttman, 1947) facet theory has implicitly assumed a philosophical stance regarding its subject matter: human beings. This standpoint conceives of human activities and understandings of these as being comprised of discrete components and envisages that appreciation of these parts and their interrelationships avails understanding of the broader life areas they make up: Facet theory and its mapping sentence form a structured categorial ontology (Hackett, 2014). In this paper the work of Hackett (2013, 2014) is considered regarding some of these assumptions and how they have shaped facet theory through the use of its major instrument the mapping sentence. We propose that three conceptual words/phrases characterise facet theory: hermeneutic consistency, structured ontology and mereology. Hermeneutical relates to a method of interpretation (Heidegger, 2008, Gadamer, 2004) growing out of their work on knowledge and truth. The phrase hermeneutic consistency refers to the ability to achieve a reliable explanation or interpretation in regard of an informational source. The second phrase, structured ontology, brings together the concept of ontology, or the underlying nature of experience or existence, where structured ontology explicates such understanding within a determinate structure. Finally, mereology is the study of part-to-whole and part-to-part relationships within an entity. Thus, we claim that it is evident that facet theory and specifically the mapping sentence is well characterised through the use of these terms. In the following pages we discuss the philosophical meanings of each of these three concepts and consider the applied implications of these in facet theory research.

Qualitative and philosophical facet theory

In the 1940's Louis Guttman conceived of and developed the approach to research in the social sciences known as facet theory (Guttman, 1947, see Levy, 1994 for a theoretical summary).

Facet theory, its application and the subsequent analysis of the data that facet theory research yielded, has been quantitative in nature (e.g., Canter, 1985a, Shye, 1978, Shye and Elizur, 1974, Borg and Shye, 1995). Facet theory research and depiction of research content domains has taken the form of structured categorial ontological systems known as mapping sentences (see Canter 1985b for details). Categorial systems have long found their presence in philosophical and psychological research. For example: in *psychology* the most familiar are probably those by Kelly and *Personal Construct Theory* – (Kelly, 2013) and Piaget and *child development* - (Piaget and Inhelder, 1969) in *philosophy* – (Chisholm, 1996). At the heart of a categorial position is an assumption that breaking down human existence into categories or subcomponents avails peerless insight into what it means to be an individual and also facilitates appreciation of social behaviours. Thus, by understanding the mereological nature of human behaviour and experience we are able to better understand what it means to be human. Facet theory has explored this content area using quantitative methods and data analysis resulting in an array of quantitative data analysis techniques (e.g., Shye and Amar, 1985).

However, over the past few years Paul Hackett has advanced the conception and expediency of qualitative facet theory. To these ends, he has been undertaking qualitative analyses of content domains employing the mapping sentence to guide the origination of research, research design and data analysis and theory development, all within a facet theory mind-set. In his research he has positioned facet theory as a philosophical orientation regarding its subject matter: the behaviour of and understanding of human beings (Hackett, 2013, 2014). What Hackett means by the word qualitative needs clarification. The term ‘qualitative facets’ has already appeared in the facet theory literature, however this has been used to mean a qualitatively arranged facet structure rather than a linear or quantitatively ordered facet: This was not Hackett’s conception of qualitative and is not employed in this essay. Rather, in this paper qualitative is used in the more usual social science sense as meaning rich observational data. Under this latter definition, there is an implication for the researcher to gather narratives, observations, visual records, and other forms of non-numerical data where the subsequent analyses of these data sets takes the form of attempting to establish reliable and valid interpretative hermeneutics.

MAPPING SENTENCE STRUCTURAL ONTOLOGY AND MEREOLGY

In the previous section we stated that the second author has been working on the development of a qualitative and philosophical format of facet theory by using conceptual and theoretical mapping sentences and through gathering and analysing interpreted qualitative data forms. Both the philosophical and theoretical underpinnings of facet theory and the facet theory approach to research design, data collection and analysis is best communicated through consideration of the primary instrument of facet theory, the mapping sentence. The mapping sentence is both the major tool of facet theory research design and analysis and is also a series of structural/spatial hypotheses. As Canter (1985b) says: “... a piece of facet research is a process of refinement, elaboration and validation of a mapping sentence.” (p266): We will be using a mapping sentence in precisely these terms in this paper. Philosophically, the mapping sentence is a structural ontology and in application to any substantive area of research and understanding can also be seen as a mereological device. Related to the notion of the mapping sentence is that *a mereology* forms a *compositional identity*, where composition is the relation between a whole and its

specific parts, in which parts form the whole and where the whole is nothing more than its parts: the whole *is* its parts (see, Cotnoir and Baxter, 2014).

Delving more deeply into the terms of the argument in this paper, the word ontology has slightly different meanings when used by a variety of disciplines that have incorporated ontology into part of their lexicon and ways of thinking. For example: in *philosophy* - ontology is a branch of metaphysics concerned with the nature of being (a broad consideration of ontology is provided by Poli and Seibt, 2014); within *logic* - ontology is the set of entities that a given theory assumes beforehand; in *technology* an ontology provides a systematic explanation of existence; within *information and computer sciences* – ontology is the rigorous designation of existent components (sorts, characteristics) and their inter-associations. From these definitions it can be seen that to some extent there are common elements in what ontology is taken to mean. Ontology may therefore appear to refer to being and components of existence, which are perhaps instantiated, a priori, to any consideration of a content domain. Given the differences in the use of the term ontology we wish to escape any possible confusion that may arise by providing a precise definition and understanding of ontology as we use this term:

“Ontology is the study and formal explication of a domain of content in terms of its more fundamental or basic categorial components as these may be understood at this elemental level and as their meaning may be further revealed through consideration of more sub-ordinate, particular or evident categorial entities”.

The second phrase in the title of this paper, *structured ontology*, brings together the concept of ontology or the underlying nature of experience where structured ontology explicates such understanding within a determinate structure. Under the definition of ontology we have provided, a mapping sentence is clearly a form of structured ontology.

Mereology is another term that can appear to have ambiguous definitions and understanding associated with it although this term is probably most confusing due to the rarity of its usage. Mereology is defined within metaphysics as: “... any theory of part hood or composition.” (Harte, 2002, p7). However, as with the term ontology, mereology has a slightly nuanced understanding within different disciplines of usage, for example: *philosophy* – (Henry, 1991); *science* – (Calosi and Graziani, 2014); *logic and mathematics* – (Urbanik, 2013); *semantics* – (Moltmann, 2003). As with the term ontology we wish to avoid confusion and misinterpretation and consequently we provide our own definition of mereology as follows:

“Mereology the systematic and explicit investigation, analysis and understanding of the relationships within an ontology, in terms of the part to part, part to whole, part to context and background and part to observation range, relationships, where and when context and background are essential and inherent components of the existence and realisation of the ontological system when changes in the background and context would result in the ontological system being significantly different to the one observed in terms of part-to-part, part-to-whole, part-to-context, whole-to-context relationships and where the specification of a different range of observations would significantly alter either the content of the ontology and the knowledge embodied within the ontology.”

From the above definitions of ontology and mereology, in qualitative facet theory and within a facet theoretical philosophy, two central theses arise:

“When taken together, a specified structured ontology and a mereological account of this structure form what is known as a mapping sentence”.

“For any specified area of interest, a mapping sentence provides a hermeneutically consistent account of a domain of interest.”

In the title of this brief paper we posited that three words/phrases characterise facet theory: hermeneutic consistency, structured ontology and mereology: The latter two of these terms have briefly been defined. In our usage of the phrase hermeneutic consistency, hermeneutical refers to a specific interpretive methodology as understood through the writing of Heidegger (2008) and Gadamer (2004). These authors were interested in knowledge and truth and based upon this we offer a definition of the phrase *hermeneutic consistency* as:

“The ability of an interpretation process to provide a coherent, trustworthy and relatively consistent understanding about an event or other source of information”.

Thus, it is evident that facet theory and specifically the mapping sentence is well characterised through the use of the terms structural ontology and mereology with the explicit intent of developing hermeneutically consistent knowledge.

The utility of a non-numerically based facet theory with the conceptual rigor that the mapping sentence is able to offer is illustrated by the second author’s consideration of Aristotle’s *Categories* (Aristotle and Ackrill, 1975) and the mapping sentence developed by the second author to present this categorical system (Hackett, 2014), which, in itself, is an ontological device. Aristotle’s ten ontological categories are: 1: Substance (οὐσία); 2: Quantity (ποσόν); 3: Quality (ποιόν); 4: Relation (πρός); 5: Place (ποῦ); 6: Time (πότε); 7: Being-in-a-position (κεῖσθαι); 8: Having (ἔχειν); 9: Action (ποιεῖν); 10: Affection (πάσχειν). Based upon the categories, Hackett (2014) proposed the mapping sentence in Figure 1.

This mapping sentence offers an account of *The Categories* that clearly displays Aristotle’s ontology and uniquely a potential mereological relationship between categories parts-to-parts and parts-to-whole and in so doing opens further exploration of Aristotle’s ontology.

Mapping a domain: further potential

The mapping sentence is at the heart of both traditional quantitative and philosophical considerations and qualitative explorations of facet theoretical approaches to exploratory and confirmatory research. The mapping sentence is the basis for facet theoretical investigations, structural hypothesis testing, and theory generation. It is also, we propose, as a stand-alone approach for investigations in the humanities and the social sciences. The mapping sentence is able to specify an area of research interest in such a way as to define the important aspects of a content domain and their interrelationships to allow a greater appreciation of the domains content. Following E.J. Lowe’s claims for the utility of the graphical display of an ontology (Lowe, 2007, p18) we now provide a qualitative / philosophical mapping sentence demonstrating the hermeneutic consistency of understanding that arises from non-numerical research that is organized through using a mapping sentence.

The content of this paper, when read by person (x) understands facet theory to embody

a mapping sentence with: **ontology**
(*facets*)
([*elements*]) and with the structure between these
(*background*)
(*range*)

ontological components being in terms of the: **mereology**
(*part-to-part*) relationships, and
(*part-to-whole*)

judges this to have: **range**
(*more*)
(*to*) hermeneutic consistency in relation to the ontological domain.
(*less*)

Figure 2. Mapping sentence for the validity of hermeneutic consistency of a mapping sentence.

If we start our consideration of the mapping sentence in Figure 2 with the range facet this delimits the understanding that the mapping sentence is communicating to be the extent to which a mapping sentence structured ontology is able to avail hermeneutically consistent knowledge of its content domain. Person (x) is taken to be any person reading and understanding the mapping sentence. The combinatorial arrangements of the two content facets are determinants of the values observed in the range, where: the ontology facet specifies the content of the mapping sentence ontology to be – *facets* (with sub-divisions of facet elements); *background* (which lists background characteristics of the instantiation of the ontology); *range* which specifies the epistemological / characteristics of the observations that constitute the mapping sentence’s logic: the mereology facet characterises the nature of the relationships that are extant within the mapping sentence ontology to be – either *part-to-part* (facet/facet element-to-facet/facet element) or *part-to-whole* (facet/facet element-to-mapping sentence);

CONCLUSIONS

In this paper we have provided support for claims regarding the potential of the mapping sentence to guide, analyze and interpret qualitative research that may be undertaken within a facet theory rubric (Hackett. 2013, 2014, 2016a&b). We have also claimed utility for the use of a mapping sentence as a purely philosophical outlook and orientation when attempting to understand human experience through our offering a mapping sentence as a philosophically coherent approach to understanding metaphysical ontologies. Facet theory and mapping

sentences form a precise though flexible framework that can be used to guide research and writing within philosophical explorations and other qualitative endeavors.

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