Abstract In the earlier chapters of this book, I have presented facet theory and mapping sentences in both their quantitative and qualitative formats. However, I have emphasised the traditional mapping sentence and quantitative facet theory research. In this chapter, I concentrate on more recent forms of mapping sentences and facet theory and provide a review and examples of qualitative facet theory and the declarative mapping sentence. To achieve this, I will consider the declarative mapping sentence in greater detail and then consider its application in a study into fine art that takes into account perceptual neuroscience and visual impairment. The study employs the declarative mapping sentence to allow the investigation of the modern art trope of the grid image through theoretically reviewing extant grid images. Uniquely, the mapping sentence then provides a guide for painting a body of work, which constitutes both the investigation and validation of the mapping sentence. Other qualitative uses of the approaches are also presented. The chapter ends with suggestions for future research.
The Evolution of Facet Theory

Theories are explanations of events and phenomena in our world and as the world around us changes so must our theories. Facet theory is no different to any other theory and we must resist the urge to necessarily preserve it in some unchanged state and to keep on asking similar questions to those we have asked before and to discover similar answers. It is perhaps a strength that a theory possesses if the theory can adapt whilst remaining coherent in its underlying theoretical principles. Facet theory has changed and developed over the years and most recently, it has moved from being a solely quantitative approach to addressing qualitative information. This transformation has not been accepted by all scholars and I have recently been told that the facet approach is a statistically based approach to the hypothetical-deductive method. This statement is indeed true. However, facet theory is so much more than just this. It is my opinion that the most important aspect of facet theory is the mapping sentence and what I have already described as the facet theory imagination. Moreover, both of these parts of facet theory are eminently appropriate for use when approaching qualitative and more philosophical forms of scholarly activity. Conceived in this manner, the approach is exceedingly flexible, which I will demonstrate later in this chapter through reporting upon how I have used a declarative mapping sentence to both understand art and to create artworks.¹

It should however be understood that my conception of facet theory incorporates a sensitivity towards the research experience. Paul Capobianco (2019) emphasises this point when he states that in my writing (e.g., Hackett 2014a) “The mapping sentence is presented as an extension of this imagination: the embodiment of a stance that structures behavior and experience in terms of discrete categories or facets within

¹ An earlier version of this chapter was published in Hackett (2020b).
which are sub-units or elements meant to exhaustively account for each facet’s variations.” (Capobianco 2019, p. 12).

Following on from my own proposition of a qualitative facet theory (Hackett 2014a), David Canter has recently proffered ‘qualitative structural theory’ (Canter 2019), which is a half-way-house between a thoroughly qualitative appreciation of facet theory and the traditional quantitative rendition of the theory.

David Canter has been to the fore in advocating the need for a theoretically rigorous approach to facet theory research, rigor combined with his own open-minded and flexible usage of the approach. Canter’s view is most clearly evident in the vast literature he has authored, co-authored, and the research literature that has emerged from researchers associated with him, in the area of what he calls investigative psychology (for an overview see, Youngs 2013). Investigative psychology is the study of both offenders and the ways of apprehending them and involves using psychological understanding at all points of the crime investigation process. It is concerned with criminals, prosecutors, law enforcement agencies and other related parties (Canter and Youngs 2009). Young has claimed that Canter’s broad based ‘facet approach’ both in the field of applied criminology and within a more general academic context represents ‘… an approach to psychological research, through the development of this (investigative psychology) discipline, which has relevance far beyond the criminal context.’ (Youngs 2013, p. 3). Canter’s work has greatly extended the ways in which facet theory has been conceptualised and applied to investigate human behaviour.

Other researchers such as Proudfoot et al. (2011) have used facet theory in an extremely abbreviated, almost schematic form. They cited Guttman and Greenbaum (1998) as their source for using facet theory and the mapping sentence as a hypothesis generator that did not seek recourse to empirical data gathering. In their research, formal hypothesis testing was via expert opinion about their twelve-facet structure for understanding internet intervention research.

As can be seen, there has been an extension of facet theory beyond its traditional realms and in the following sections I briefly report upon some of my own, more novel, uses of the facet approach.
Mapping a Domain: The Mapping Sentence as a Stand-Alone Approach and Integrative Tool

The mapping sentence is at the heart of the facet approach to exploratory and confirmatory research. In this section, I offer support for the mapping sentence as a tool to integrate research that does not use facet theory in its execution. In such a situation, the mapping sentence allows formal and exacting consideration of the variables that comprise a research domain. I also present the mapping sentence as a stand-alone tool for conceptualising a complex understanding and investigation of human behaviour and experience. I advocate the use of the mapping sentence in a non-orthodox manner and in a way that requires the collection of qualitative data rather than the usual numerical information. Canter, in his investigative psychology, has evaluated qualitative materials such as personal narratives from criminals. Indeed, Canter stresses the importance of using ‘… careful description and categorisation’ as the basis for theory development (Youngs 2013, p. 14). I have used the mapping sentences as a stand-alone technique in several applied research areas in which I did not employ traditional facet analysis (smallestspace analysis, etc.). For example, I have utilised the mapping sentence as a definitional tool within visual research, classifying fine art images and then as a guide for painting fine art works that explore the content domain specified in the mapping sentence. Through my research, I have developed a specific form of the mapping sentence for use with non-numerical information and which typically does not possess a range facet, which I have called the declarative mapping sentence (Hackett 2020b).

The Need for and Use of the Declarative Mapping Sentence

So far in this book, whilst I have considered both the declarative and traditional forms of mapping sentences I have concentrated mainly upon presenting the traditional form of mapping sentence. In this chapter, I
provide further details about the declarative mapping sentence which I use to support my assertions that it is both appropriate and profitable to use this form of mapping sentence within qualitative research and philosophical scholarship. I also provide examples of the use of the declarative mapping sentence in order to provide further information about the approach and its philosophical and linguistic antecedents. Hereunder I provide several examples from both my own research (including studies I have undertaken in the areas of philosophy and fine art) and examples that derive from the scholarship of others. The examples I present include studies concerned with religious behaviour, the evaluation of IT systems, clinical reasoning and other diverse illustrations. Moreover, I argue that it is a necessity to provide transparent definitions, in the form of well-structured mereologies, which offer boundaries to a research domain and suggest the structural qualities of the concepts contained within the specified domain. I propose that the declarative mapping sentence is an extremely useful instrument for designing, carrying-out, and analysing research that is both non-numerical and complex.

Qualitative research is often seen to have weaknesses when compared to quantitative forms of enquiry, such that it is imprecise and may not be generalized outside of the sample used in the research. However, quantitative research also has its weaknesses, for example, the abstract nature of its studies and its reductionist tendencies. Indeed these and other weaknesses of quantitative research have contributed to my motivation for developing the declarative mapping sentence for use in qualitative research. Qualitative approaches provide rich data and insight and offer peerless levels of understanding of the lived experience of a phenomenon. I developed the declarative mapping sentence as a flexible template for qualitative research with the additional aim of using this as a framework to facilitate greater levels of comparability between findings from different qualitative studies. The declarative mapping sentence also provides the researcher with increased levels of confidence in their findings.² The

² It is important to state at this point that not all researchers would agree that lack of comparability between research studies is a problem. Indeed some would claim this as a virtue. I am drawn to this argument as I see great merit in the one-off, individualistic study. However, I also feel numerous instances exist in which the ability to directly compare different qualitative research studies would be both interesting and productive in terms of knowledge generation (Hackett 2020b).
fundamental utility of the mapping sentence is demonstrated in Paul Capobianco’s description of the process of using a mapping sentence to guide research:

the reflexivity of a mapping sentence built into the systematic methodology prescribed by facet theory compels the researcher to ask in what ways the collected data gels or does not gel with the mapping sentence’s facets; that is, to what extent the hypothesis about the categorial breakdown of the domain in the mapping sentence is respondent-appropriate and relevant to how an individual actually “understands” their experience within the domain’s complex context. Capobianco 2019, p. 13

Both forms of mapping sentences (traditional and declarative) act in the role suggested by Capobianco as they are very similar as they are both explicit statements of a research domain which is achieved by exhaustively identifying the important aspects or variables (facets) and their components (elements). Respondents are also specified for a specific study. All mapping sentences are formal propositions in regard to the content they are specifying. Research that utilises a mapping sentence does not use the mapping sentence as an unsupported statement. Mapping sentences may take this somewhat remote and abstract form at their conception but they must then progress to include information that is gathered from participants in the research, the literature, scholarship, and so on. Through this process, mapping sentences progress beyond being simply speculative.

Mapping sentences in all their uses offer propositional statements of an area of interest that is subject to investigation in order to test the veracity of the mapping sentences structure. Qualitative research explores and produces rich insight by revealing the feelings and thoughts of individuals towards a state of affairs, object, event, and so on. Geertz (1973) noted that ‘thick descriptions’ were at the heart of qualitative research, description that went beyond a terse statement in regard to a phenomenon and several authors (e.g., Gorli et al. (2012), in the context of multi-method research) have noted how qualitative research can offer meaningful

3 In Hackett (2020b) I present an example of how the use of both traditional and declarative mapping sentences to view and explore a single content area, which in this example is bird behaviour.
Thick descriptions are developed by a researcher as rigorous accounts of human activities that incorporate contextual information and which include comments, explanations, and observations from research participants. Such descriptions provide documentation of the whole of an experience including expressions of what the event means to a person or persons and which allows for a deeper level understanding to be communicated to readers of such narratives. Gorli et al. (2012) commented upon how qualitative research worked with thick data in order to produce descriptive information and knowledge, which was idiosyncratic but deeply and personally meaningful.

However, Hackett (2020b) wrote that the deeply personal and rich nature of qualitative research is not only a strength but that this may lead to the findings that arise from qualitative research being fragmented and disconnected from existing research that was concerned with the content domain. The outcome of such fragmentation may be the retardation in theory development about the phenomenon of interest.4

A consequence of the difficulties associated with directly comparing the results from different qualitative research studies may have led to some social and psychological researchers turning to quantitative approaches in their studies. In quantitative research, stringent sampling methods are clearly defined and explicitly stated research variables enable quantitative research approaches to produce results from which researchers may generalize to a broader population from their specific project’s findings (Lincoln and Guba 1985).

The criticism that qualitative research is only able to be directly informative and speak with authority only about the sample of respondents used in the specific study may appear damning and may incline towards a quantitative approach. However, numerical research too has its critics. For example, the conversion of human behaviour and experience to a numerical measure means the study and its results become distant from the real, actual experiences of those living within the context of the event that is under investigation. Numerically based research also analyses data using statistical methods which are seen by many to lessen or even negate the rich and personal qualities of the understanding that is developed in

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4 See, Polit and Beck (2010) for a discussion on generalizing from qualitative and quantitative data.
qualitative research (Townsend et al. 2010). Moreover, numbers have the proclivity of suggesting a spurious notion of precision and due to the universality of numerical systems a sense that results analysed numerically are themselves universally applicable.

Hackett (2020b) offered examples of familiar situations in which numerical rating scales may be used in familiar situations and how this may be problematic and provided the example of a doctor asking a patient about their experiences of pain. It is quite likely that we have been in the situation of a doctor asking us to rate how severe a pain is on a scale of 1 to 10 (very little pain to excruciating pain). Asking this question provides the doctor with very useful clinical information and insight. However, a response to a question like this would be unlikely to produce a response that is comparable between individuals. This is common sense as one person may have given birth or have been involved in a major accident in which they were severely injured. Such an individual may rate the pain their current pain experience from a tooth ache as “4”. However, an individual who has not previously experienced a severe form of pain may rate the current pain as being “8 or 9”. Moreover, people are individuals, both physiologically and psychologically, and regardless of previous experience, people differ in terms of both how they experience the world and the language the use to communicate such experiences. The problem therefore in using such a rating is using it under the assumption that it is either comparable with ratings from other people or assuming that any form of parametric statistical analyses of this data would yield valid results. I would suggest that it is here of more value and interest to gather personal histories and the stories and personal experiences along with a description of their present pain experience.

Hackett (2020b) also made reference to the example from the research of Edwards et al. (2004). These researchers were concerned with physiotherapy techniques and noted that people were often asked to rate their experiences on a 0 to 10 scale (that was similar to the above noted procedure). They claimed how patients’ experiences were made abstract through the use of a numerical scale and that this form of data did not adequately reflect or portray the sophistications of the therapeutic procedure. They too believed that experiential narratives would better capture and convey patient experience and that numerical assessments in this
situation constituted a metaphorical manipulation of the experience of pain.

The traditional mapping sentence was developed in order that quantitative data may be gathered that reflected the combined interactions and effects of multiple variables (facets) in structuring experience within a specified content domain. The strengths of a quantitative approach is in its ability to produce data in which confidence may be held and which the researcher may generalize outside of the context of the study within which it arose. However, I have noted the weaknesses of the quantitative approach and the problems of numerical reductionism. With the problems of quantitative research in mind I have developed a qualitative facet theory (see e.g., Hackett 2014a, 2016b, 2020). The first and most important change that I made in my qualitative conceptualisation of facet theory was the removal of the range facet from the mapping sentence. This important alteration was made as it is the range facet that specifies the responses that will be gathered in a piece of facet theory designed research, and traditionally it specifies these as being numerical. In the next section of my writing I will discuss the range facet and below (in Fig. 4.1) I provide an example declarative mapping sentence that attempts to encapsulates the influences upon a person that may affect their experience of reading a book. I include this declarative mapping sentence to aid this discussion.

The Presence or Absence of the Range Facet

The example of a declarative mapping sentence given in Fig. 4.1 lacks a range face. The range facet is absolutely essential within the traditional mapping sentence as it provides the coherence to responses to the content of the mapping sentence, orients the respondent to the content domain that is being investigated and assures consistency in the responses and in how they are analysed.

The absence of a range facet is an extremely important aspect of the declarative mapping sentence and is a consequence of the open-ended forms of data gathering that is undertaken in qualitative research. The reason for the removal of the range facet in the declarative mapping
Person (x) experiences reading the book in terms of it being read: as a book
on a reader
on a computer/tablet
on their phone

where their aim is to read the book for: pleasure reasons, and where this is
education
work

read: at home and whilst they are: alone
whilst traveling with friends
at work with family
at college with colleagues

Fig. 4.1 Example of a declarative mapping sentence for the experience of reading
sentence and the reason that this is a strength is because its removal allows different types of observations and other forms of information to be gathered and understood within the framework of the declarative mapping sentence’s definition of the content domain of interest. On this understanding of a mapping sentence, it is a template which structures a domain and allows direct comparisons to be made between studies and for knowledge to be developed through such comparison. If a researcher decides to include range facet in a declarative mapping sentence it is included in a form that does not specify specific measurements of outcomes, it never specifies numerical or quantitative outcomes, and it will tend to be stated in broad terms.

An example of a declarative mapping sentence with a range facet is that used by Wihlborg et al. (2019). The range in their declarative mapping sentence is not a true response range and numerical responses were not gathered from respondents across such a range. Instead, the researchers used their declarative mapping sentence to develop a qualitative research study and following the completion of the research they performed a secondary-analysis of the qualitative information that they had gathered during a group discussions. The authors then allotted the discussion to one of two dichotomous options on what they called an ‘organisation range’. In doing this, they organised the qualitative information they had gathered using their mapping sentence. By using the declarative mapping sentence in this way, they employed the ontological and mereological characteristics of the mapping sentence’s facet, elements, and connective phraseology to organise their data and the organisational range was used to designate the epistemological features of their observations. Here, the organisational range was a component of the mapping sentence’s logic instead of being a delimiter placed upon what constituted a valid response from a subject.

When used within qualitative research a mapping sentence acts as a template for designing, gathering and analysing the information that is provided by participants. The trustworthiness of a declarative mapping sentence is assured through the stating of facets, elements, and connective phrases, the repeated use of the declarative mapping sentence and its ability to promote consistent and comparable understanding of the phenomena being investigated. Furthermore, in both traditional and
declarative mapping sentences the legitimacy of a sentences’ stated facet structure is established through the instituting of a rational and convincing relationships between the specified facet structure and the real-world phenomena to which the mapping sentence applies. Without the range facet being present, a declarative mapping sentence may expedite the development of knowledge in relationship to broader conceptual domain more responsively than when a traditional mapping sentence is used. An illustration of this breadth is demonstrated if a declarative mapping sentence was used in the investigation of dental treatment. In this situation, participants could be requested to critically engage with the experiences they have had of dental treatment and a declarative mapping sentence would provide a framework for the interpretation of the data that arises from interviews, observations, sort procedures, and so on. Such a mapping sentence would also allow a flexible though comparable analysis of the different forms of data gathering. A traditional mapping sentence when used to assess dental treatment, on the other hand, must specify a range of acceptable output from the research instruments used this phenomenon. For instance, the range could be stated as the level of satisfaction they experience, the frequency of their visits, their willingness to pay for the treatment, or a host of other outcomes. However, respondents could not explicitly combine response ranges when they offer an answer although they may in fact be doing so implicitly, nor can they proffer an expression of regarding what they think or feel about the specified range provided except by responding within this range.

In order to more fully understand the way in which a declarative mapping sentence functions and how it may establish itself as a trustworthy research instrument for the domain to which it is applied, it is useful to consider the sentences generic composition in greater detail. A declarative mapping sentence always includes the person or persons who are its subjects or participants or indeed the person who is reading, understanding, and/or in some way responding to, the declarative mapping sentence. Background facets may also be present in a declarative mapping sentence.

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5 It is also possible to have non-human animals as the subject of a mapping sentence (see, Hackett 2020b or indeed inanimate objects or concepts as the subject of a mapping sentence who applied the mapping sentence to objects of fine art (see, Hackett 2013, 2016a, 2017c)).
sentence in which they specify the characteristics that are considered to be aspects of the research domain or situation that are important to include in research in order to understand the research domain or are influential in the instantiation of the mapping sentence ontology. A mapping sentence ontology is also specified in a declarative mapping sentence in terms of both a content ontology (sub-components of the ontology in the form of facets and facet elements) as well as a connective ontology (the words and phrases that are used to connect the facets and facet elements). A declarative mapping sentence is also overt and explicit as it clearly defines the relationships present within the mapping sentence’s ontology in terms of both part-to-part (facet/facet element-to-facet/facet element) and in terms of parts-to-whole (facet/facet element-to-mapping sentence).

Above, I have been describing the declarative mapping sentence and its characteristics and I now consider the practical questions of when and where it is appropriate to use a declarative mapping sentence in a research project.

When and Why to Use a Declarative Mapping Sentences

I have developed the declarative mapping sentence through research and scholarship in which facet theory has been as a philosophical orientation in which the world is conceived such that life is conceived as complex and full of phenomena and events that are intertwining (Hackett 2013, 2014a, 2016b). Consequently, over recent years I have modified the traditional mapping sentence and quantitative facet theory to be used with in non-numerical research. When examinations of research information that has been gathered at different times and in varied locations is examined by qualitative researchers and their interpretations are consistent, then the information has been interpreted in a reliable manner and hermeneutic consistency is present. My aim in extending the mapping sentence’s usage into qualitative enquiry was in order to facilitate hermeneutic consistency through its employment. Initially I did not rename the traditional
mapping sentence in order to identify my distinctive form of this tool. However, this led to some people misunderstanding my adaptation of the mapping sentence. I therefore renamed the traditional mapping the declarative mapping sentence to distinguish this instrument when used with non-numerical data. The new name also emphasises the point that a range facet is likely not included in the declarative mapping sentence and that this is intentional and not a mistake. I have used the declarative mapping sentence in a variety of situations as demonstrated in the following publications: (Greggor and Hackett 2018; Hackett 1983, 2013, 2014a, b, 2015, 2016a, b, 2017a, b, c, 2018a, b, c, 2019a, b, Hackett et al. 2011, 2016, 2018; Koval et al. 2016; Lou and Hackett 2018; Schwarzenbach and Hackett 2015; Shkoler et al. 2020).

The declarative mapping sentence offers an empirically and theoretically valid framework (a generic although adaptable structural ontology) within which to design and interpret qualitative research. The findings are potentially hermeneutically consistent because the structure of the ontological components in the declarative mapping sentence remains constant whilst its contents emerge from the specific information gathered. This allows the mereological relationships between various aspects of the research to be initially hypothesised whilst permitting the substance and combinatorial meaning of the elements present in an enquiry to be idiosyncratic to a participants’ and to be determined by them. In this chapter, I expand upon and attempt to support these claims through considering the metaphysical and linguistic sources of the declarative mapping sentence and review how both others and I have employed the framework within research in the social sciences and humanities. My argument for the trustworthiness and utility of the declarative mapping sentence rests upon the overall structure of a sentence being an appropriate instrument into which may be incorporated the meaning of complex research domains and then used to design further enquiries (Hackett 2020b). In the following sections, I provide some illustrative examples of how I, and others, have used the declarative mapping sentence in selected research studies.
Mapping Sentences and Abstract Fine Art

Each of us perceives and understands art in a highly idiosyncratic manner. This is never truer in the context of various types of abstract fine art. In this situation, one person may perceive a master piece whilst another person may say that their ten-year-old daughter could have done a better job! There is therefore a problem in defining what art is and as a consequence of this, several different bases for such definitions have been proposed. Any definition of art must comprise the conditions that are needed to delineate what art is and for a definition to endure it cannot be refuted even by a single example that falls outside its definitional properties. There are several orientations that can be taken towards attempting to understand fine art. For example, many scholars (Dickie 1974, 2000; Bachrach 1977; Fokt 2013; Oppy 1991; Stecker 1986; Wollheim 1987) have upheld an institutional theory or definition of art: “institutions such as museums and galleries, and specific agents working within them, have the power to dictate what is art and what is not.” (Oxford Reference 2020). Another perspective is the one assumed by philosopher Paul Crowther (2007) in his consideration of an aesthetic orientation towards art and the functions that art performs. However, in my research, it was not my aim to answer grandiose questions in regard to what constitutes art. Instead, I conducted research and extended the use of a mapping sentence into this highly subjective and qualitative area of human experience with the aim of using the mapping sentence as a framework for descriptive discussion about art (Hackett 2013, 2016a, 2017c).

Crowther (2007) attempts to answer questions such as: what constitutes art, what accords value to an artwork and what are the criteria for establishing the merits of a work of art. He adopted and extended a phenomenological perspective is in which he emphasised rudimentary features of human perception and related these to both contemporary as well as abstract visual fine art. Additionally he questioned whether what we may think of as the value of a piece of art is rooted in aesthetics and suggested a model to assist in understanding the value of a piece of art that incorporates such perceptual features as imitation and representation. Other somewhat intangible aspects of an art work were also
included, such as, knowledge, the understanding a viewer brings to the situation of the historical links that may be incorporated and even hidden in an art work and the piece’s associations with the art canon. His model comprised features of an art work including; image; temporality; metaphysical depth; notions of the art canon; context; cognitive structure, and he emphasised the importance of the style of a piece, where original style may be linked to artistic merit (Hackett 2020b). Crowther concluded that in the post-modern, consumer age of the last twentieth century artistic value has been degraded to a point where fashion and trends in society and the economy determine both the significance and value of a work of art (Crowther 2007).

In my research and writing about abstract fine art, I was initially interested in abstract two-dimensional fine art (Hackett 2016b) and subsequently in three-dimensional forms of abstraction (Hackett 2017c). In both cases, I incorporated Paul Crowther’s structural ontology, which he believes provides a theoretical structure for understanding of abstract art. He offers this as an account for the phenomenological experiential components of the complex contextual rooted aspects through which we come to understand our visual art experiences.

Crowther’s model possesses eight characteristics which are combined and/or sub-divided, to provide the possibility of comprehensively explaining our experiences of art abstraction. The eight characteristic are as follows: (1) **resemblances** to visual forms through combinations of colours, shapes and textures, as when we see forms in works that are essentially all one colour by, (e.g., Yves Klein); (2) **gestural associations** which are evoked through gestural associations with visual forms, such as our feeling that some shapes or colours are violent or depressing; (3) **revelations of** usually invisible visual features, such as very small surface features, unique perspectives and atmospheric effects; (4) **novel environments** in which events and phenomena exist as a product of usual or novel perceptual environments; (5) **neoteric configurations** that result in the reconfiguration, destruction, remaking of, and so on, of the familiar which

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6 In this chapter I have chosen to include my research into the experience of three-dimensional abstract fine art (Hackett 2017c). I could have incorporated my work on two-dimensional abstraction but the former has grown out of the latter and I have made reference to the former when this has been appropriate.
result in neoteric visual configurations; (6) visual suggestions such as visual traces or suggestions, copies of existing features or counter-factual phenomena; (7) spatiality/structure features such as colour, shape, volume, geometry, and so on, that alone or in combination have spatial appearances; (8) fantasy imaginary and dream phenomena. (adapted from Hackett (2020b).

Crowther’s model is comprehensive and thorough. In Hackett (2016b) I asked whether his model was able to demonstrate the, “ongoing reciprocal interaction or influence that must exist between different characteristics of such a complex experience as is involved in perceiving, understanding and appreciating, valuing, disliking, etc., of an artwork” (Hackett 2016b, p. 42). I therefore developed a declarative mapping sentence depicting perception of abstract three-dimensional fine art based upon Crowther’s understanding whilst addressing what I saw to be the weaknesses of his model (Fig. 4.2). The declarative mapping sentence I offered also took into account the interplay between Crowther’s eight characteristics. Furthermore, I proposed that Crowther’s features may be better and contextually appreciated within my declarative mapping sentence.

Making Fine Art

One of the areas in which I have made neoteric use of the mapping sentence includes as a guide for my theory driven research within fine art practice. In the preceding section, I have considered how a declarative mapping sentence was be developed to account for a persons’ experiences of art works. In the writing that follows, I demonstrate how I have incorporated mapping sentences into the production of the art work itself.

In the context of my art practice, I used a mapping sentence to develop an understanding of modern abstract geometric art and subsequently the mapping sentence acted as a guide for my drawing and painting. The mapping sentence I developed was for the understanding and painting of one specific form of modernist abstract art: the modernist grid in a theoretically motivated rendering of the visual impact of diplopia (I wrote about this extensively in Hackett 2013). The development of this
mapping sentence first entailed the specification of the basic, pertinent ways that I was able to vary in my painted grid images. These were the grid’s colour, figure/ground relationship, accuracy of image, orientation, geometry, cell shape, consistency, and background. Having developed this list of the basic facets of the grid that I could manipulate in a grid painting. I then arranged the facets in a manner that logically specified the facet interrelations in the mapping sentence for grid painting (Fig. 4.3).

This mapping sentence allowed me to develop a systematic understanding of how artists had incorporated the constituent parts of grid

| Resemblance | Gestural association | Revealing |
|-------------|---------------------|-----------|
| resemble    | evoke               | reveal    |
| items –     | through the         | to        |
| events –    | combination of      | to        |
| states of   | visual qualities,   | reveal    |
| affairs –   | and / or through    |           |
|            | gestural associations, |       |
| not resemble| do not evoke        | do not reveal |
| visual forms, | and / or that:      |           |

**Fig. 4.2** Declarative mapping sentence for understanding the experience of perceiving abstract art. (Adapted from Hackett 2020b)
Novel environments & Suggestions & Spatial / Structural

|                        | use       | suggestive | spatial / structural |
|------------------------|-----------|------------|---------------------|
| items –                | do not use|            |                     |
| relations –            | to        |            |                     |
| states of affairs - that are not usually visible, or that: |            |                     |                     |

characteristics present in a specific abstract three-dimensional artwork.

Fig. 4.2 (continued)
| facet | facet name   | elements       | facet role |
|-------|--------------|----------------|------------|
| A     | art medium   | a1 painting    | modular    |
|       |              | a2 drawing     |            |
|       |              | a3 print       |            |
|       |              | a4 other       |            |
| B     | color        | b1 colored     | modular    |
|       |              | b2 monochrome  |            |
|       |              | b3 grayscale   |            |
|       |              | b4 embossed    |            |
| C     | accuracy     | c1 precision   | polar      |
|       |              | c2 imprecision |            |
| D     | geometry     | d1 linear      | axial      |
|       |              | d2 curved      |            |
| E     | consistency  | e1 consistent  | polar      |
|       |              | e2 inconsistent|            |
| F     | figure/ground| f1 figure      | axial      |
|       |              | f2 ground      |            |
|       |              | f3 changeable  |            |

**Fig. 4.3** Facet roles for the mapping sentence for defining grid image variation
images in their grid painting. I then used this mapping sentence as a guide for the painting of a series of abstract geometric grid artworks that distort the grid within the strictures implied by the mapping sentence whilst preserving a grid’s essential ‘grid-ness’ whilst visually exploring its logical and aesthetic boundaries.

My interest in the modernist and post-modernist grid as an art image comes from the way in which this geometric array uniquely covers all aspect of a two-dimensional visual plane with its more or less precisely prescribed geometry. Throughout the last ten years, I have conducted several research projects and have undertaken various art practices (painting, drawing, print-making, installation) that have investigated the grid. In this work, I concentrated upon the grid as it is typically imagined: two sets of orthogonally intersecting regularly spaced straight lines. This very unelaborated understanding of the grid imposes restrictions upon art practice and the development of understanding about how in their work, other artists had employed and adapted the image of the grid. In addition to representing the visual qualities of the grid image within my painting,
I also used the grid as a tool for depicting the visual impairment of diplopia. The grid was particularly useful in depicting visual impairment as its latticed image totally accounts for a visual plane and distorting the grid likewise presents a holistic account of visual impairment.

Due to the sophistication of my intended visual images and the complex theoretical aspects of normal and impaired vision that underpinned these, I needed a guiding account of the painted grid that would enable me to understanding the ways grid images have been used in modern art. This taxonomical statement needed to be sophisticated enough to incorporate the variations that previous artists had used in their work along with the implications of diplopia upon the perception of the grid, whilst being clear and precise enough to be practically useful in guiding later painting. In the second chapter of this book, I commented at length on how category formation, the allocation of events to categories, and the subsequent arrangement or ordering of categories appear to be fundamental human behaviours. Moreover, categorical ontologies are pervasive forms of how we understand our worlds and they form foundations upon which more elaborate cognitive operations may be built. I have also cited how facet theory’s mapping sentence has been used as a template for understanding and conducting explorations into several areas of complex human behaviour. I therefore decided to develop a mapping sentence for the categorical understanding and categorical sequencing for painting of grid-based art images.7

Both categorising and sequencing activities are also central to the creation of artworks (figure-ground, figurative-abstraction, foreground-mid distance-far distance). Categorisation and sequencing (or ordering) is present in a manner that is particularly obvious in the images that are based upon the grid image. I closely inspected paintings and drawings of grid images that arose from many artists, schools, and art movements. Influential work viewed included those from The New York School, Bauhaus and artists De Stijl, Piet Mondrian, Tomma Abts, Huszar, Wassily Kandinsky, Sean Scully, Mark Francis, Peter Joseph, and many

7 This template in essence formed a mereological account that was needed prior to my painting commenced for me to understand the elements of the grid that I could manipulate and how I could manipulate these whilst still maintaining an image that was unambiguously seen as being ‘a grid’.
others. My inspection of these contemporary paintings and drawings revealed that artists had carried and distorted the geometry of the grid from an axiomatic form within a variety of figure/ground contexts. Furthermore, this manipulation had been undertaken in an almost hit and miss random way, and with the exception of artists such as Sol Lewis, these variations of the grid image were largely undocumented. This deficiency in systematic documentation contributed to a paucity of understanding developing about applied and theoretical elements of grid-based art. This lacking was similar to situations where facet theory coordinated research by using a mapping sentence in areas of applied research where previously only atheoretical investigations had been conducted. In these situations, the mapping sentence has enabled the synthesis of the combined effects of multiple influences within the content area of interest. Much of the deficiency in understanding of the grid image was based upon how the parts of the painted grid together formed what is perceived as being ‘grid-like’.

I therefore identified the elements of the grid image that had been varied by artists in the works I considered, in terms of physical geometric characteristics of the grid, for instance, its figure—ground relationships. Through this procedure, I refined my definitional framework (mapping sentence) to permit classification of existing grid images. The facets of the mapping sentence were line straightness and density of line; the background to the grid image; and colour elements. Sub-classifications of grid variation were identified and listed for each facet, which provided a clear documentation of how the facets of a grid image can differ from each other. A complete list of facets is colour, figure/ground, accuracy, orientation, geometry, cell shape, consistency, and background. The facet elements were coloured, black and white, greyscale, embossed, precise, imprecise, linear, curved, consistent, distorted in part, figure, and ground.

8 Sol Lewitt’s documentation was prodigious and a great inspiration to my research.
9 I identified the significant parts of the two-dimensional grid that varied in the images I viewed. It would be possible to employ an approach using a random sample of respondents and aggregate (representative) responses could have been calculated that were of greater reliability and validity than the present case study. However, it is not the intention of this research to develop any form of nomothetic measurement but rather to produce initial insight and to develop a mapping sentence that is useful in grid painting.
changeable, vertical, diagonal, oblong, square, image, abstract, neutral, and cartographic. This resulted in a mapping sentence for the painted grid (Fig. 4.4):

In both art practice and theorising about grid-based artwork, the mapping sentence definition of grid image variation constitutes a definitive, pragmatic template for understanding and painting art based upon these images. The development of the mapping sentence was the start of extended practice in which I created paintings, drawings and made prints using the mapping sentence to guide my two-dimensional work: The mapping sentence essentially formed an ‘explanatory vocabulary’ for my grid painting (see Fig. 4.5 for an example of one of my paintings entitled ‘8033’).

Tests of the mapping sentence were undertaken through sketches, which were later worked into more developed and complete pieces, demonstrating how the mapping sentence informed practice-based understanding. Descriptive frameworks were developed for any of my grid images that were based upon all of the facets of the mapping sentence from which I selected one element from each facet for each piece of work (in a process analogous to selecting an element from each facet for each survey question). By using an unambiguous template for my understanding of artistic grid images I was able to experiment and change several aspects of my work whilst maintaining coherent grid perception. In addition to practical explorations, the mapping sentence assisted in exploring aspects of theory: For example, various neuroscience and Gestalt notions such as similarity, proximity and angle of line intersection, axiomatic and abstract of grid image, line doubling to represent diplopia versus perspectival distortions. Using a mapping sentence procedure, I could produce valid, reliable, and unmistakable grid images and later complete grid paintings through which I explored the perceptual complexity of the mapping sentence. There was a further function performed by the mapping sentence as the definition of the complexity of the grid image suggested the enormity of attempting to create a body of

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10 Other non-image aspects that were considered included: support size and its relationship to grid-cell size, grid line thickness and painting size and how these related to figure-ground tension; the balance between grid and background; the effects of supports (including: canvas, linen, paper, stretchers); medium (paints, powder pigments, glazes, oil colors, alkyds, oil bars).
A grid in fine art may be a work that was made up to represent all possible combinations of the grid's variable elements. This led to my decision to hold constant some facets (after reviewing literature on grid painting, that is, Albers (2013) I reasoned that I could paint and vary grid images without colour having a major role in effecting reception of the grid's structure). I therefore

| Facet A: Art Medium | Facet B: Color |
|---------------------|---------------|
| a1 painting         | b1 colored    |
| a2 drawing          | b2 monochrome |
| a3 print            | b3 grayscale  |
| a4 other            | b4 embossed   |

with the coloration of

| Facet C: Accuracy | Facet D: Geometry |
|-------------------|-------------------|
| c1 precision      | d1 linear         |
| c2 imprecision    | d2 curved         |

created with

| Facet E: Consistency | Facet F: Figure / Ground |
|-----------------------|---------------------------|
| e1 consistent         | f1 figure                 |
| e2 inconsistent       | f2 ground                 |
|                       | f3 changeable             |

and a consistency that is

| Facet G: Orientation | Facet H: Cell Shape |
|----------------------|---------------------|
| g1 perpendicular     | h1 rectangle        |
| g2 diagonal          | h2 square           |

in an orientation that is

| Facet I: Background |
|---------------------|
| i1 literal          |
| i2 abstract         |
| i3 neutral          |
| i4 cartographic     |

upon a background that is

and is perceived to be

| Range |
|-------|
| more  |
| to    |
| less  |

as a grid image

**Fig. 4.4** Mapping Sentence for Defining Grid Image Variation. ('Reproduced with kind permission of Routledge')
rewrote the mapping sentence so that the colour facet had a single element of greyscale. The mapping sentence rather than stultifying my artistic endeavours, defined a ‘creative variety’ leading me to rigorously reconsider the axiomatic Modernist grid trope, and to question the grid’s fixed qualities. This suggested the forms and structures that could be explored and insinuated as to how grid-lines and grid-cells could be crafted in relation to figure and ground qualities. My painting also questioned the representation of normal and impaired vision using the mapping sentence and in order to achieve this I incorporated neuroscientific understanding of diplopia\textsuperscript{\textsuperscript{11}} and my studio practice integrated Gestalt

\begin{figure}[ht]
\centering
\includegraphics[width=\textwidth]{Fig. 4.5 Painting 8033.png}
\caption{Painting ‘8033’}
\end{figure}

\textsuperscript{11}I identified Lee Allen to have been an artist with visual impairment who had attempted to paint his macular degeneration. His research paintings and subsequent writing were extremely informative in my research.
theory and neuroscience. The research progressed through several stages all of which were informed by the mapping sentence, which I also used to enable coherence within the body of work I produced.

The nine facets I identified in the mapping sentence for defining grid image variation (Fig. 4.6) were identified as influencing both the creation and the perception of fine art grid images. Each of these facets played a specific role (in the sense of facet roles mentioned in this text), independently and together, in designing, making and viewing grid-based art. The facets and their roles are listed in Fig. 4.6.

Facets in the mapping sentence appeared to play axial, polar, and modular roles. The interpretation of these roles and indeed the validation of the mapping sentence came about through an interpretive cycle. In this process, components of the grid were analysed in reference to the grid as a whole and my prior knowledge of facet theory, which cyclically interacted with my painting and my interpretation and understanding of the grid image. The mapping sentence demonstrated its utility in guiding art practice but in the future, this framework could be used to design research, which questioned individuals (both artists and viewers) about how they understand the grid image. This data could be gathered using, for example, Likert scales which would allow smallestspace analysis to be performed and may lead to refinement in the meaningful understanding of the MS and possible joint roles played by facets.

In the research reported above, I used facet theory and a mapping sentence in a manner that allowed me to initiate and use a guide for my artwork. This definitional taxonomy, by exhaustively identifying the variable components in two-dimensional grid-based artworks enabled me to break down my understanding of these images and then to reconstruct them reflecting the instantiation of grid variation and visual impairment. This is a novel use of the mapping sentence in which the data that I gathered to investigate the utility of the mapping sentence came in the form of visual images which confirmed the mappings validity through my resulting paintings aesthetic and theoretical merit. The mapping sentence allowed me to systematically distort the grids I created so that they embodied the perceptual effects of diplopia whilst the images remained
| facet | facet name   | elements          | facet role |
|-------|--------------|-------------------|------------|
| A     | art medium   | a1 painting       | modular    |
|       |              | a2 drawing        |            |
|       |              | a3 print          |            |
|       |              | a4 other          |            |
| B     | color        | b1 colored        | modular    |
|       |              | b2 monochrome     |            |
|       |              | b3 grayscale      |            |
|       |              | b4 embossed       |            |
| C     | accuracy     | c1 precision      | polar      |
|       |              | c2 imprecision    |            |
| D     | geometry     | d1 linear         | axial      |
|       |              | d2 curved         |            |
| E     | consistency  | e1 consistent     | polar      |
|       |              | e2 inconsistent   |            |
| F     | figure/ground| f1 figure         | axial      |
|       |              | f2 ground         |            |
|       |              | f3 changeable     |            |

Fig. 4.6 Facet roles for the mapping sentence for defining grid image variation
grids. By defining the grid’s variable components, I permitted myself a clear understanding of the axiomatic grid and how artists had varied grid images yet allowing grids to perceptually endure. To the best of my knowledge, this is the first time in published research, that a mapping sentence has been used to define art images or to guide the creation of art images or objects. It may also be the first research to use visual art as qualitative data within a facet theory rubric. In the following section, I continue my consideration of the use of qualitative data within facet theory.

### Religion and the Process of Sacralisation

Lucyna Przybylska provides another example of the use of declarative mapping sentences in her research. She is a geographer who investigated religion and what she calls the process of sacralisation (Przybylska 2014). Her research viewed how religiosity has become an area thought worthy

| G | orientation | g1 perpendicular | axial |
|---|-------------|------------------|-------|
|   |             | g2 diagonal      |       |

| H | cell shape  | h1 rectangle    | axial |
|---|-------------|-----------------|-------|
|   |             | h2 square       |       |

| I | background  | i1 literal      | modular |
|---|-------------|-----------------|---------|
|   |             | i2 abstract     |         |
|   |             | i3 neutral      |         |
|   |             | i4 cartographic |         |

Fig. 4.6 (continued)
of the social science’s consideration following on from the dominance of the secular paradigm. Religiosity is now seen to be an important part of public and private life. She considered the literature on how re-emergence of religion is understood and sacred spaces (Bilska-Wodecka 2012; Davie 2013; Havlíček and Hupková 2013; Klima 2011; Soljan 2012; Theije 2012; Zelinsky 2010;) using the Polish city of Gdynia as a case in point.

Przybylska’s analysis identified a series of facets that to account for the visual presence within Gdynia which she linked together in a declarative mapping sentence (Fig. 4.7).

Having proposed the declarative mapping sentence, in order to investigate the visual expression of religion in the city she used a variety of qualitative research approaches, including, field observation, analysis of source documents, analysis and criticism of the bibliography, visual documentation, and participant observation. Przybylska also used the declarative mapping sentence as an interpretative framework for her analysis and in writing-up her research. She stated that her declarative mapping

![Fig. 4.7 A mapping sentence of the process of sacralisation (Przybylska 2014, p. 118)](image)
sentence, “illustrates a kind of model that emphasises different components of the term landscape sacralisation, (and) it can be used to interpret, step by step, the complex phenomenon of visual manifestation of religion in the landscape.” (Przybylska 2014, p. 118). Moreover, the mapping sentence defines sacralization as well as suggesting a way to conduct research into this which enabled Przybylska to address religious needs and the public expression of their faith.

The declarative mapping sentence also facilitated her consideration of both individual expressions of the sacred (C), aspects of sacralisation (D), early and modern forms of the sacred (F) in the context of different space (E). It also allowed her to address in depth the facets of the mapping sentence both in an isolated manner and as they exerted a combined effect and which therefore enabled her research to comprehensively delve into the sacralization process. For Przybylska the declarative mapping sentence was, she claimed, useful as factors and different forms of sacralization could be designated. The declarative mapping sentence, “enables a step by step exploration of different facets of the multidimensional process of landscape sacralisation” (Przybylska 2014, p. 131). She concluded that her declarative mapping sentence was unique in the geography of religion literature in the manner in which it presented the conceptualised the process of sacralization.

Prison Officers’ Occupational Stress

Sian Blake (2020) employed a declarative mapping sentence in her research into occupational stress in prison officers in England. Blake focused on occupational stress as stress is often comes about due to the interaction and relationship between a work environment and the people who work there. Recent documentation was cited by Blake to indicate that stress, depression and other mental illnesses have been found to be present to a significantly greater extent in prison officers than other occupational groups (Health and Safety Executive 2019; Ministry of Justice 2020). Prisons are especially pertinent as they are noted as being stress inducing settings as they may involve prison officers as being in situations which they find stretch their capacity to cope: In these situations, the
level of stress reaction experienced is dependent of the individual’s interpretation of the stressor and their ability to deal with it.

Blake also contextualised Cooper and Marshall’s 1976 model of occupational stress with this group of employees. Blake set the scene for her study by noting how prisons are emotionally charged environments that are often thought of as being extremely tough and even dangerous places to work. She also commented how prisoners have programmes in which they may engage in order to help them to cope with emotional and other difficulties they may encounter. However, as a person employed as a prison officer she claims that there is much less formal support for prison officers.\textsuperscript{12} Perhaps, in part as a consequence of this lack of support, there is a culture within prison staff that is rooted in what some think of as toxic masculinity and machismo attitudes. The result of such a culture is that prison officers may feel uncomfortable to share their emotional reactions at work. However, research that has been conducted by academics and by the British government has emphasised that it is extremely likely that prison officers experience stress associated with their occupation. This is evidenced, Blake claimed, by levels of sickness that are regularly higher than sickness in the general public with ten working days on average being annually lost to sickness for each prison officer, which contrast with 4.4 days for the average worker in the UK (Blake 2020).

In her research, Blake reviewed the literature on employee stress and discovered Cooper and Marshall’s 1976 model of occupational stress. She set herself the question of whether this model could be usefully applied to the stress experienced by prison officers and if it could shed light on the unparalleled levels of stress it is claimed that prison officers experience. Her research took the form of a secondary source review of literature which she analysed and organised within the structure suggested by a declarative mapping sentence (Fig. 4.8).

Her results of this review allowed her to state that the model of occupational stress proposed by Cooper and Marshall (1976) can, to a large extent, be usefully applied to the stress that is experienced by prison officers in their work settings and that Cooper and Marshall’s model yielded understanding and insight.

\textsuperscript{12} She speaks with experience about such facilities as she is a serving prison officer.
Prison officer (x) experiences stress within their work in terms of their work being:

‘1/ Organisations structure and climate’

- ambiguously defined
- clearly defined

in terms of their roles, where they feel stressed due to:

‘2/ Stressors that are intrinsic to the job’

- poor working conditions
- work overload
- time pressures

in situations in which they feel they operate within a climate of:

‘3/ Role within the organisation’

**Fig. 4.8** Declarative mapping sentence (DMS) for Cooper and Marshall’s model of stress applied to prison officers (Blake 2020, p. 25)
and where stress may be influenced by relationship with:

‘4/ Relationships at work’

- colleagues
- management

along with their concerns about:

‘5/ Career Development’

- job security
- promotion

**Fig. 4.8** (continued)
Blake developed her declarative mapping sentence by identifying the pertinent aspects of occupational stress that have been discovered using Cooper and Marshall’s original model. After analysing the literature however she found that the mapping sentence needed modification through the inclusion of additional facets and the modification of her initial facets.

The experience of stress is a complex phenomenon, especially when a moderate amount of stress may be beneficial in the performance of a task. Blake claimed that her research demonstrated the applicability of Cooper and Marshall’s (1976) model of occupational stress, as this is present in prison officers. Stress within an occupational setting is, says Blake, a multi-faceted issue that may be difficult to understand especially as responses to stressful situations as well as the situations that a person finds stressful, may appear idiosyncratic. Her research demonstrated that Cooper and Marshall’s (1976) model offered a useful framework for attempting to comprehend prison officers’ occupational stress due to the way in which it arranged stress into explicit categories based on occupational, organisational, and individual factors. Cooper and Marshall’s model also incorporated a recognition of the previously noted causes within the individual experiencing stress along with occupational role, characteristics of the employing organisation and the interaction of all factors.

In her research, she reviewed the literature on occupational stress in prison officers using a declarative mapping sentence that was based on Cooper and Marshall’s (1976) model. She used the declarative mapping sentence’s facets and elements a frame within which she thematically analysed the contents of publications. She also included articles in the analysis related to prison officers’ stress experiences that were focused upon the interface between their home and work. The discovery of these external stress related features resulted her in amending her initial declarative mapping sentence by including a facet of external conditions (facet 6). She also added two facets that recognised the research that had looked at individual differences using the “big-five personality traits” (openness to experience, conscientiousness, extraversion, agreeableness, neuroticism) (Rothmann and Coetzer 2003) (facet 7a) and locus of control (facet 7b). The modifications are shown in Fig. 4.9.
‘1/ Organisations structure and climate’

- ambiguously defined
- clearly defined

in terms of their roles, where they feel stressed due to:

‘2/ Stressors that are intrinsic to the job’

- poor working conditions
  - workplace safety
- work overload
- time pressures

in situations in which they feel they operate within a climate of:

‘3/ Role within the organisation’

- autonomy

Fig. 4.9  Declarative mapping sentence (DMS) for stress experienced by prison officers (Blake 2020, pp. 42–43)
- ambiguity

- conflict

and where stress may be influenced by relationship with:

‘4/ Relationships at work’

- colleagues

- management

along with their concerns about:

‘5/ Career Development’

- job security

- promotion

which are in a feedback loop of influence with:

Fig. 4.9 (continued)
‘6/ External conditions – (work-home interface)’

- time-based conflict
- strain-based conflict
- behaviour-based conflict

where the individuals ability to adapt may be influenced by their:

‘7a/ Individual differences I’

- extraversion
- agreeableness
- conscientiousness
- neuroticism
- openness to experience

and / or by their having an:

Fig. 4.9 (continued)
Prison officer (x) experiences stress within their work in terms of their work being:

Blake (2020) noted that the issues of occupational stress in prison officers are systemic issues. In this group of employees, she says, stress results from the combination of actual and perceived structural features of prisons, combined in the manner suggested in the revised mapping sentence. Blake (2020) recognised Cooper and Marshall’s model as offering a useful point from which to commence an exploration of prison officer’s experiences of occupational stress. Their model, she stated, had limitations and she addressed some of these in her modified mapping sentence, which more completely explained the features that produce occupational stress in prison officers.

However, she also noted that the revisions that she made in Cooper and Marshall’s framework needed further amendments and primary research based upon the revised declarative mapping sentence. Examples she cited of revisions included facets that take into account the influence that staff-prisoner relationships can have on prison officers’ experiences of stress and the role of gender and other individual differences.

7b/ Individual differences 2”

- internal locus of control

- external locus of control

when coping with stress.

Fig. 4.9 (continued)
Characteristics of the Clinical Reasoning Process

Another example of the application of a declarative mapping sentence is provided by the research into the competence and education of ambulance nurses by Jonas Wihlborg et al. (2019). The declarative mapping sentence for this research is shown in Fig. 4.10. The researchers proposed a broad question that bound the scope of their research which was, “what similarities, differences and characteristics of clinical reasoning are found...
among groups of specialist ambulance nurse students and professional specialist ambulance nurses?” (Wihlborg et al. p. 49).

Before I consider the research by Wihlborg et al. (2019), it is important to note the presence of a range facet in their mapping sentence. Throughout this book, I have said that the range facet is used in traditional mapping sentence in conjunction with quantitative research and not in declarative mapping sentences in qualitative enquiries. This is true but there are exceptions to this statement. Range facets guide and determine the type of research that will be undertaken and specify what will be considered the output or data that will be gathered. This is essential and appropriate when conducting quantitative research. For instance, by stating that the measurements that will be taken in a study will range from 1, which equals very dissatisfied through to 5 which means very satisfied, and that responses will be in the form of 5 possible integers. However, “6”, “452”, “A”, “cat”, or “4.87” and so on, are all unacceptable responses as they are not in the response range. Establishing acceptable responses means that there is no ambiguity in the data gathered and responses may be directly compared and aggregated. Removal of ambiguity in quantitative research allows for confidence to be established in the data gathered and the results that are developed out of the research.

However, qualitative research gathers information from participants, which usually takes the form of an open expression by the participant. As such, it is not appropriate to specify which responses are acceptable and which are not. If a researcher specifies the range facet and thus the responses that are acceptable, in qualitative research he or she is engaging in a restrictive practice. In the case of Wihlborg et al.’s (2019) research, the range facet in the mapping sentence was not used to determine the form of response from respondents but to later classify open responses using a stated protocol. Consequently, the authors included a range facet which incorporated two elements in the form of ‘analytical’ and ‘non-analytical’. It is interesting that Wihlborg and colleagues, rather than labelling their output facet as a response range facet, they named this an organisation range. This is an extremely important point as the facet performed in the role of a post-data gathering protocol for organising

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13 I briefly commented upon this earlier in this book.
the information present in the open responses that they had amassed and did not require those taking part in the research to provide responses in the form of values in the organisational range. As range-bound responses were not gathered from respondents, this mapping sentence is declarative rather than traditional (Fig. 4.10).

Wihlborg and colleagues’ research took the form of a case study (Kim et al. 2006; Mauffette-Leenders et al. 2005). Participants were Swedish ambulance staff who were all registered nurses with training in ambulance nurse education and clinical practice. There were 32 participants in the study, 19 of which were students and 13 were specialist ambulance nurses. All student participants had attended or were attending specialist ambulance nurse training and had different levels of clinical nursing and ambulance care experience.

Participants were all allocated to groups and they all actively participated in discussions, which lasted 30 to 90 minutes, of case stories they were given. Cases were designed for the groups to discuss which included many theoretical and applied aspects of the clinical work that ambulance staff engage in. Open discussions involved the researcher listening actively but only interrupting and interacting with participants occasionally in order to clarify points.

The researchers designed a declarative mapping sentence with two facets that differentiated the substance of the cases. The first facet was of Clinical Reasoning and was composed of eight elements that were incorporated from Levett-Jones et al.’s (2010) principles of clinical reasoning. They used these as elements because they said these reflected the types reasoning to be found in a clinical setting of. The elements were: considering patient situation; collecting information; processing information; identifying problems; establishing goals; taking action; evaluating outcomes; reflecting and processing. Their second facet was made up of five elements that accounted for ‘case content’, with the five elements being nursing, medicine, ethics, legislation, and organisation. They incorporated this facet and its elements into the declarative mapping sentence so as to enable the identification of the different settings in which respondents’ employed reasoning. The element of nursing embodied nursing’s cardinal central properties (Ekman et al. 2011; Henderson 1991) and the second element incorporated medical aspects of their work. Elements
three to five were characteristics of their work associated with reasoning. As I mentioned earlier, the range facet was used to organise data into two elements dependent upon it employing either an analytical approach or non-analytical approach,\textsuperscript{14} where these two approaches were derived from accounts of clinical reasoning in the literature (e.g., Durning et al. 2015; Eva 2005; Marcum 2012). An argument can also be made for this range facet actually being a content facet. The researchers transcribed the discussions and the declarative mapping sentence was used to perform an analysis of the discussions’ contents.

The authors claimed that their results revealed the declarative mapping sentence they used in their research offered a structure within which to analyse and identify characteristics of the reasoning that was used by ambulance staff. The mapping sentence also facilitated variation in the configurations of reasoning elements between the different respondent groups. The first student group fluctuated between analytical and non-analytical reasoning regardless of content or process. The group became somewhat more analytical if they were reasoning about nursing and medicine. The group also focused on medicine and nursing but considered ethics and legislation less. The group directed a small amount of their reasoning on information collection and rarely on reflection and processing. The second student group's reasoning was both analytical and non-analytical with most reasoning being about nursing and a large amount of reasoning was about organisation and medicine, with little directed towards legislation. This group directed their reasoning towards all elements of the Clinical Reasoning facet; however, collecting information, reflecting, and processing were infrequent targets of their reasoning.

In their article, the authors went on to draw similarities and differences between the two groups and made especial note that ethics and legislation issues were least discussed and information collection was discussed less than evaluation, reflection and processing. In all groups’ participants’ focus was on applied considerations and mostly on evaluation and least on collecting information. Moreover, the student group tended to use

\textsuperscript{14}The researchers wished to quantify responses and they therefore assigned each unit of reasoning they discovered as being either analytic or non-analytic based on the depth of knowledge participants employed in completing a specific item during the groups’ discussions.
analytical reasoning and processed information more than those in the professional group.

In conclusion, a declarative mapping sentence was used in the research by Wihlborg et al. (2019) to design and analyse a qualitative study which they later transformed to a what may be considered to be a quantitative analysis. Using the declarative mapping sentence, they were able to establish configurations of activities within groups of ambulance staff in Sweden and to allow differences and similarities to be identified between students and trained nurses in terms of the declarative mapping sentence’s facets and elements.

**Black Lives Matter**

The next brief example of the use of a declarative mapping sentence is by Hackett and Schwarzenbach (2020). In their mapping sentence, they responded to the rightful outrage of many people towards the murder of the black man, George Floyd, by a white police officer in Minneapolis and the vitriolic attack upon the black bird watcher, Christian Cooper, by a white woman in Central Park, New York.

In the United States, as well as in many other countries, racism is rampant. There seemed to be a peak in racial atrocities towards the end of May 2020. This crescendo included the murder by a white male police officer of the unarmed black man George Floyd in Minneapolis, and the verbal attack in Central Park, New York, by a white woman on a black male bird watcher, Christian Cooper. In the George Floyd killing, a crowd looked on as he died after he had been arrested for spending an allegedly counterfeit 20-dollar bill. Christian Cooper filmed a woman calling the police to report an African American was threatening her life. When the police arrived, it was apparent that Cooper was doing no such thing and the incident was widely shared on social media as yet another racist action.

In their writing Hackett and Schwarzenbach (2020) considered the impact of these and other racially motivated events specifically upon the practice of ethnographic research. These authors first reviewed how the health and well-being of those from minority groups were affected by
racism and how these disadvantages put them in a worse position in terms of COVID-19 where Black Americans account for almost one in four Covid deaths whilst constituting only one in eight of the US population. Even in the presence of the ongoing Black-Lives-Matter movement, the chapter by Hackett and Schwarzenbach was added to a textbook on ethnography and as an after-thought, and only after the two attacks mentioned above. The authors claimed this reflected how racial issues are often neglected in our considerations of the research process and in the disseminators of knowledge and that the possibly detrimental preconceptions that are held need to be unacknowledged and addressed through “bracketing” from the start and during a research project or publication. Indeed, they bracketed the contents of their writing in terms of its inevitable inherent biases and preconceptions.

Hackett and Schwarzenbach (2020) developed a declarative mapping sentence for understanding acts of racism. In order to formulate this mapping sentence, the authors considered many aspects of what we may call racism, along with other forms of overt and covert human activity. They started by noting how racism, like other catastrophic events, is often ignored until some terrible event occurs and how in America, have not made necessary social and individual changes in order to avoid this happening. They also noted how, over the past decades, many necessary changes have been made in regard to the language that is used when speaking about people of colour but that these changes have not been accompanied by other substantial changes, for example in policing practice, incarceration rates, life opportunities for people of colour, and so on. Jessica Schwarzenbach and I also reflected upon some of our own experiences and the privileged status we occupy as white people. For example, I am a white bird watcher and I have never found myself in the position of Christian Cooper. Indeed, I do not have to consider that someone may see me with a pair of binoculars and report me to the police, in the way a person of colour does.

Having considered some of these and other background details, the authors resisted listing the egregious ways in which people of colour may be treated and instead attempted to identify the variety of ways an ethnographer can address racism. This led to the development of the declarative mapping sentence for understanding acts of racism (Fig. 4.11).
A specific person or group of people (x) commit the:

**Intent**

(intentional  )

(unintentional )

(unthinking   )

**Type of action**

(verbal       )

(physical     )

(mixed        )

racist act, which is targeted against:

**Target**

(an individual )

(specIFIC group)

(wider culture )

and has the consequence of causing:

**Consequence**

*Fig. 4.11* Declarative mapping sentence for understanding acts of racism. (Reformatted from: Hackett and Schwarzenbach 2020)
The declarative mapping sentence in Fig. 4.11 embodies the initial thoughts of the authors in terms of the pertinent aspects of a racist action. It is an initial template that qualitative researchers can use to design research into racism and the consequences of these acts. The facets denote the main types of racism that the authors consider to be important when designing or interpreting qualitative research that addresses racism. These specify the racist action in terms of these being the perpetrator's intent, the type of racist action committed, the target of the racist action, the consequence of the action, and also, who is viewing or interpreting an act of racism.

In the mapping sentence, it can be seen that the mapping sentence specifies that acts of racism may be understood in terms of:

- whether they are undertaken by either groups or individuals by people;

\[(\text{death})\]

\[(\text{physical injury})\]

\[(\text{psychological injury})\]

\[(\text{mixture of the above})\]

\[(\text{social segregation/unrest})\]

to a person or persons, and which is perceived by a person who is:

**Person viewing**

\[(\text{Black})\]

\[(\text{not Black})\]

Fig. 4.11 (continued)

The declarative mapping sentence in Fig. 4.11 embodies the initial thoughts of the authors in terms of the pertinent aspects of a racist action. It is an initial template that qualitative researchers can use to design research into racism and the consequences of these acts. The facets denote the main types of racism that the authors consider to be important when designing or interpreting qualitative research that addresses racism. These specify the racist action in terms of these being the perpetrator's intent, the type of racist action committed, the target of the racist action, the consequence of the action, and also, who is viewing or interpreting an act of racism.

In the mapping sentence, it can be seen that the mapping sentence specifies that acts of racism may be understood in terms of:
– the actions which are committed (verbal, physical, or acts that are a mixture of these);
– the intention behind such an act (intentional, unintentional, or unthinking);
– the person or persons against whom the act is targeted (individuals, specific groups, or wider culture groups);
– the action’s consequences: (death, physical injury, psychological injury, a mixture of these, and social segregation/unrest);
– the person viewing and interpreting the action (black or not black).

The mapping sentence will need to be adapted to meet the needs of each specific research project through the adaptation, deletion, and addition of facet elements. The authors believed that by using the mapping sentence will help researchers when designing research into racist actions by listing the forms of racist activities and by providing a framework within which to design research instruments. The authors concluded by stating that this was an initial proposition for the content of the declarative mapping sentence which would inevitably change through use.

**Attitudes Towards Different Forms of Transportation**

Travelling is an inevitable part of our lives. Some may find this enjoyable in a variety of contexts, whilst in a different situation they may find travelling a chore. Golam Morshed is a transportation researcher from the Technische Universität München. In his ongoing research, he has used declarative mapping sentences to design and understand a variety of aspects of transportation related behaviours.

One of the projects Morshed is concerned with looks at what we do whilst we are travelling. For example, when we are travelling we often engage in an activity that is not associated with driving. Examples of these include gazing out of the window, listening to radio or other forms of pre-recorded music, reading by in a wide variety of formats from books
and papers to electronic devices, eating, drinking, or even sleeping. Furthermore, we can engage in activities in isolation or in a variety of combinations, such as eating, drinking, and listening to music at the same time (G. Morshed, Personal Communication, 2020). Morshed noted also that the types of activities with which we engage are individualistic and also vary dependent upon who we are travelling with (family, friends, colleagues, etc.). What activities we engage in will also vary related to the modality of transport we are using. Examples he provided included the ability to sleep only if you are not driving and are taking, for example, some form of public transport. The author then notes how all activities take time to commit and that timers can be thought of as belonging to one of the following categories or types: contracted time, committed time, necessary time, and free time. Furthermore, each activity may be classified as belonging to a specific class of activity, namely, mandatory activity, maintenance activity, or discretionary activity. What we do whilst we travel also vary in terms of what they achieve. For instance, some of the things we do may be work related and may perhaps also increase our productivity. However, other activities may not be productive but simply enjoyable or relaxing (such as gazing out of a window).

When he conducted a literature search, Morshed discovered that over the last 20 years a large literature and number of research projects that have been undertaken on this topic. However, he was unable to find a clear and unambiguous definition in any of this research regarding what constituted a travel-based secondary activity. Morshed (Personal Communication, 2020) therefore used existing research in order to develop a declarative mapping sentence for secondary activities during travel (Fig. 4.12).

**Secondary activities during the travel:**

![Declarative mapping sentence for secondary activities during travel](image_url)
In the declarative mapping sentence for secondary activities during travel Morshed has incorporated all of the aspects discussed above in the form of a sentence that suggests the relationship between these.

In another study, Morshed investigates the transportation activity of car sharing. Morshed (Personal Communication, 2020) comments upon the large number of studies that have been conducted into car sharing in the USA and in other countries. He notes that car sharing has advantages such as the potential to very significantly reduce car ownership and the number of cars on the road and that little of the literature concentrates upon young drivers between the ages of 18 and 35. Thus, amongst drivers of this age relatively little is known regarding their attitude towards the practice of car sharing. Furthermore, Morshed discovered no studies that specifically investigated car sharing attitudes in current learner drivers who were attending driving schools or the holders of temporary driving licenses. Examples of temporary licenses include those available to young people of 17 years of age in Austria and in Britain where you can apply for a provisional (learners) license at the age of 15 years 9 months and start driving at 17. Restrictions apply to these and similar licenses such as having to be accompanied in the car by a person who has a full driving license. Furthermore, in Austria, all new licenses are temporary during the first year during which they must practice and at the end of the year, the new driver must pass two tests of driving.\(^{15}\) Not all the current learner and temporary driving license holders have a car that is available to them and they have to hire a car in order to attain driving practise. As an alternative to renting a car, they may engage in car sharing. Renting a car in Austria, and many other countries, is relatively expensive, especially for young people. However, the alternative, car sharing, has the problem of availability and accessing a shared car a problem exacerbated by not all towns and cities having a car sharing facility or at least one that is available to temporary license holders. As a consequence, young drivers may attempt to afford to purchase a car and once they have become used to owning a car they may find it difficult to take what may feel like a step backwards and become a car sharer. Morshed (Personal Communication, 2020) therefore developed a declarative mapping sentence to encapsulate

\(^{15}\)These and similar rules vary from country to country.
the criteria and factors that may impinge upon a person’s decision to car share in Austria (see Fig. 4.13).

As can be see, this mapping sentence is complex as there are many factors that Morshed found influential in car sharing decisions for Austrians. However, he discovered the utility of the declarative to provide a framework for his ongoing research in this area.

Using Information Technology

The final example I will present of the use of a declarative mapping sentence is of study that Zhang et al. (2016) carried out into the use of constructs in research. This is a very different type of illustration both in terms of the subject matter of its application and it having a heavily theoretical foundation. These authors started by claiming the importance of using clearly defined constructs in research and concentrated on the area of users’ reactions to information technology. As a background to their research, Zhang et al. (2016) stated how the choice of the research approach chosen by a scholar was associated with whether they held either a constructivist or positivist perspective. Constructivists understand the world to be an uncertain place in which people are seen to largely construct their experiences and their understanding of these. Positivists, on the other hand, see the world as being much more a concrete place which we can discover through careful observation. Zhang,
et al., note how the positivist–constructivist dimension has a large effect upon the type of constructs we employ and the degree of clarity we expect them to have. In their writing, they claim a position between these two poles as being the one they adopt.

The authors then go on to consider constructivism and positivism and associate this with facet theory and the use of mapping sentences. A positivist orientation may, they claim, be reflected in an expectation in the ability for a construct to be predictive of observations in the situation of the research and beyond. Conversely, holding a constructivist perspective may imply that a construct is simply a label for a phenomenon within a specific context and that this is unlikely to transfer to other situations. The authors then delve deeper into how important it is that concepts in research are rooted in clearly defined constructs. Facet theory has typically been used as a quantitative measurement and technique in the context of empirical research (McGrath 1968, 1984; Lange 2008). However, Zhang et al. (2016) believe facet theory’s core value to be its implicit logic, and they fix their attention upon using facet theory to aid in the development of clear constructs along with how it is use in conceptualisation. Zhang and colleagues believe that theories are built using constructs as building materials (Weber 2012). In my writing in Hackett (2020b) I noted how Zhang et al.’s (2016) understanding that researchers articulate who use conceptualisations to define and put limits around abstract concepts (Kaplan 1964) and that in these situations conceptualisations specify the constructs meaning (Schwab 1980). They also place an emphasis on the need for appropriately specified and used concepts that have been developed with precision (Klein and Delery 2012; Locke 2012; Osigweh Yg 1989; Skilton 2011; Yaniv 2011) which permit the understanding of the bounds of a construct (Weber 2012). Zhang, et al. continue by stressing how the facet theory methodology provides a logical perspective that helps in establishing clear conceptualisations of research constructs and allows a visualisation of the interrelation between concepts. This, they say, propels the researcher towards using clear concepts. They also emphasise how it is important to determine clear and precise grounds that will be used to allow comparison and contrast between constructs.

Later, in their own research, Zhang and colleague viewed literature on IT user’s satisfaction and noted that much had been written on construct
validity (e.g., MacKenzie et al. 2011; Petter et al. 2007; Straub et al. 2004; Suddaby 2010) but they concentrated on the need for constructs to be clearly defined, noting a paucity of literature on this. Because of this lacking, Zhang et al. (2016) decided to look at facet theory (Guttman 1954a; Guttman 1954b) and they make reference to the assertions by Guttman (1971) that he developed facet theory to allow clarity in definitions associated with research in the form of a mapping sentence: the approach which Zhang et al. (2016) adopted, using a declarative form of a mapping sentence to explore conceptual items associated with this content. After searching the literature, they noted how user satisfaction (Wixom and Todd 2005), user information satisfaction (Ives et al. 1983), and end-user computing satisfaction (Doll and Torkzadeh 1988) were central to the concept. They included these aspects of IT users’ satisfaction as facets within what in essence was a declarative mapping sentence as it did not include a range facet and which also did not have any connective ontology (this is presented in Table 4.1 below).

Based upon the IT satisfaction literature, the authors specified two facets, those of evaluative target and evaluative response. The first facet was of possible the ways in which a reaction may be expressed in relation to satisfaction with IT. This expression facet had the elements of attitude or a belief. The second of their facets contained three different targets to which satisfaction to which a user may have satisfaction within IT. The elements of this facet were information system and computer application. The authors stated that their facets formed a definition, simplified in order to illustrate the ability of their approach but that could have included other facets. However, they saw their mapping sentence as a clear statement of their conceptualisation of the concept of satisfaction with IT.

| Facet                  | User Satisfaction | User Information Satisfaction | End-User Computing Satisfaction |
|------------------------|-------------------|--------------------------------|---------------------------------|
| A: Evaluative Response | A[1]: Attitude    | A[2]: Belief                   | A[1]: Attitude                  |
| B: Evaluative Target   | B[1]: Information System | B[1]: Information System | B[2]: Computer Application     |
In Hackett (2020b), I incorporated the facets and their elements from Table 4.1 and formed a declarative mapping sentence for IT satisfaction (Fig. 4.14) by combining elements from the two facets Zhang and colleagues (2016) were able to depict satisfaction with IT in a comprehensive manner in terms of different expressions of satisfaction in terms of either user information satisfaction or end-user computing satisfaction.

Zhang et al. believed that theirs was a valid and useful definitional system as through the selection of element pairing their mapping sentence allowed the classification of all events that fall within the concept of IT satisfaction. However, Zhang et al. went on beyond simply stating that their classification system was valuable and evaluated this against the seven principles or requirements that must be met by a classification system offered by McGrath (1968). Zhang et al. (2016, p. 9) stated these requirements to be: (1) Concepts in a content universe should be specified in terms of all relevant facets; (2): The facets, collectively, should be logically exhaustive of the content universe; (3) The logical relationships among facets should be specified; independence among facets is

| Facet A                      | Facet B                      |
|------------------------------|------------------------------|
| Evaluative Response          | Evaluative Target            |
| A(1) Attitude                | B(1) Information System      |
| A(2) Belief                  | B(2) Computer Application    |
| The satisfaction of user (x) may be characterised in terms of their: |

Fig. 4.14  Declarative mapping sentence (Hackett 2020b)

16 See: Shye and Elizur 1994; Hackett 2014a; Hans et al. 1985; Levy 1990, for details of how a concept may be defined using a mapping sentence and its structuples.
preferred; (4) Each facet should be analysed into a set of collectively exhaustive; (6) The logical relationships among elements of a facet should be specified; (7) The relationships among the concepts defined according to the facets and the elements of facets should correspond to the focal phenomenon. By evaluating their declarative mapping sentence along the above criteria Zhang and colleagues found it to fulfil the requirements for being a valuable approach to classification.

Conclusions

In my continuing research, I have been developing and refining the declarative mapping sentence for several years. My aim in undertaking this work has been to advance a research tool that is flexible and applicable within a wide variety of qualitative and philosophical research contexts. In this chapter, I have given details of some of the situations in which both I, and other researchers using the declarative mapping sentence, have applied this in the design and execution of their research. The illustrations I have included have demonstrated the width and diversity of contexts within which the declarative mapping sentence has been usefully used. My selective review has demonstrated that the mapping sentence can be used within qualitative and philosophical investigations in order to engender knowledge in regard of the phenomenon that is being investigated. This is especially the case when the research is concerned with complex behaviours, events, states of affairs, and so on, and in cases where it would be inappropriate to state an outcome variable and I have suggested that the declarative mapping sentence has a value in the design and interpretation of qualitative research. In Chap. 5 I will present an example of the use of the traditional mapping sentence applied to a novel area of research: avian cognition and behaviour.

References

Albers, J. (2013). Interaction of Color: 50th Anniversary Edition. New Haven, CT: Yale University Press.
American Psychological Association. (2020b). Constructivism, APA Dictionary of Psychology: Positivism, https://dictionary.apa.org/positivism

Bachrach, J. E. (1977). Dickie’s Institutional Definition of Art: Further Criticism. The Journal of Aesthetic Education, 11(3), 25–35.

Bilska-Wodecka, E. (2012). Człowiek religijny i związki wyznaniowe w przestrzeni miasta w XX i na początku XXI wieku. Kraków: Instytut Geografii i Gospodarki Przestrzennej UJ.

Blake, S. (2020). Constantly Under Pressure: A Declarative Mapping Sentence Guided Assessment of Cooper and Marshall’s 1976 Model of Occupational Stress Applied to Prison Officer. Dissertation, School of Law and Social Sciences, University of Suffolk, UK.

Canter, D. (2019). Qualitative Structural Theory: A Basis for Decision-Making. International Studies of Management & Organization, 49(3), 265–282. https://doi.org/10.1080/00208825.2019.1627705.

Canter, D., & Youngs, D. (2009). Investigative Psychology: Offender Profiling and the Analysis of Criminal Action. New York: Wiley.

Capobianco, P. M. (2019). Book Review: Facet Theory and the Mapping Sentence: Evolving Philosophy. Use and Application. Frontiers in Psychology, 10, 468. https://doi.org/10.3389/fpsyg.2019.00468.

Cooper, C. L., & Marshall, J. (1976). Occupational Sources of Stress: A Review of the Literature Relating to Coronary Heart Disease and Mental Ill Health. Journal of Occupational Psychology, 49, 11–28.

Crowther, P. (2007). Defining Art, Creating the Canon: Artistic Value in an Era of Doubt. Oxford: Oxford University Press.

Davie, G. (2013). Sociology of Religion. A Critical Agenda. London: Sage Publications.

Dickie, G. (1974). Art and the Aesthetic: An Institutional Analysis. Ithaca, NY: Cornell University Press.

Dickie, G. (2000). The Institutional Theory of Art. In N. Carrol (Ed.), Theories of Art Today (pp. 93–108). Madison: University of Wisconsin Press.

Doll, W. J., & Torkzadeh, G. (1988). The Measurement of End-User Computing Satisfaction. MIS Quarterly, 12(2), 259–274.

Durning, S. J., Dong, T., Artino, A. R., van der Vleuten, C., Holmboe, E., and Schuwirth, L. (2015) Dual Processing Theory and Experts’ Reasoning: Exploring Thinking on National Multiple-Choice Questions, Perspectives on Medical Education 4, 168–175.

Edwards, I., Jones, M., Carr, J., Braunack-Mayer, A., & Jensen, G. M. (2004). Clinical Reasoning Strategies in Physical Therapy, Physical Therapy, 84(4),
Ekman, I., Swedberg, K., Taft, C., Lindseth, A., Norberg, A., Brink, E., Carlsson, J., Dahlin-Ivanoff, S., Johansson, I. L., Kjellgren, K., Liden, E., Ohlen, J., Olsson, L. E., Rosen, H., Rydmark, M., & Sunnerhagen, K. S. (2011). Person-Centered Care–Ready for Prime Time. European Society of Cardiology, 10, 248–251.

Eva, K. W. (2005). What Every Teacher Needs to Know About Clinical Reasoning. Medical Education, 39, 98–106.

Fokt, S. (2013). Solving Wollheim's Dilemma: A Fix for the Institutional Definition of Art. Metaphilosophy, 44(5), 640–654.

Geertz, C. (1973). Thick Description: Towards an Interpretive Theory of Culture. In C. Geertz (Ed.), The Interpretation of Cultures. London: Hutchinson.

Gorli, M., Kaneklin, C., & Scaratti, G. (2012). A Multi-Method Approach for Looking inside Healthcare Practices. Qualitative Research in Organizations and Management: An International Journal, 7(3), 290–307.

Greggor, A. L., & Hackett, P. M. W. (2018). Categorization by the Animal Mind. In P. M. W. Hackett (Ed.), Mereologies, Ontologies and Facets: The Categorial Structure of Reality. Lanham, MD: Lexington Publishers.

Guttman, L. (1954a). An Outline of Some New Methodology for Social Research. Public Opinion Quarterly, 18(4), 395–404.

Guttman, L. (1954b). A New Approach to Factor Analysis: the Radex. In P. F. Lazarsfeld (Ed.), Mathematical Thinking in the Social Sciences (pp. 258–348). New York, NY: Free Press.

Guttman, L. (1971). Measurement as Structural Theory. Psychometrika, 36(4), 329–347.

Guttman, R., & Greenbaum, C. W. (1998). Facet Theory: Its Development and Current Status. European Psychologist, 3(1), 13–36.

Hackett, P. M. W. (1983). Observations on Blink Rates in Ferruginous Duck (Aythya nyroca) in a flock of mainly Mallard (Anas Platyrhynchos). Working Paper/Field Notes.

Hackett, P. M. W. (2013). Fine Art and Perceptual Neuroscience: Field of Vision and the Painted Grid, Explorations in Cognitive Psychology Series. London: Psychology Press.

Hackett, P. M. W. (2014a). Facet Theory and the Mapping Sentence: Evolving Philosophy, Use and Application. Basingstoke: Palgrave.
Hackett, P. M. W. (2014b). A Facet Theory Model for Integrating Contextual and Personal Experiences of International Students. *Journal of International Students, 4*(2), 164–176.

Hackett, P. M. W. (2015). *Classifying Reality*, by David S. Oderberg (ed.) (2013) Chichester: Wiley-Blackwell. Frontiers in Psychology, Section Theoretical and Philosophical Psychology. *Frontiers in Psychology, 6* 461. https://doi.org/10.3389/fpsyg.2015.00461.

Hackett, P. M. W. (2016a). *Psychology and Philosophy of Abstract Art: Neuroaesthetics, Perception and Compensation*. London: Palgrave Macmillan Publishers.

Hackett, P. M. W. (2016b). Facet Theory and the Mapping Sentence As Hermeneutically Consistent Structured Meta-Ontology and Structured Meta-Mereology. *Frontiers in Psychology, section Theoretical and Philosophical Psychology, 7*, 471. https://doi.org/10.3389/fpsyg.2016.00471.

Hackett, P. M. W. (2017a). Commentary: Wild Psychometrics: Evidence for ‘General’ Cognitive Performance in Wild New Zealand Robins, Petroica Longipes, Frontiers in Psychology, Section. *Theoretical and Philosophical Psychology, 8*, 165. https://doi.org/10.3389/fpsyg.2017.00165.

Hackett, P. M. W. (2017b). Editorial: Conceptual Categories and the Structure of Reality: Theoretical and Empirical Approaches, Frontiers in Psychology. *section Theoretical and Philosophical Psychology, 8*, 601. https://doi.org/10.3389/fpsyg.2017.00601.

Hackett, P. M. W. (2017c). Opinion: A Mapping Sentence for Understanding the Genre of Abstract Art Using Philosophical/Qualitative Facet Theory. *Frontiers in Psychology, section Theoretical and Philosophical Psychology, October, 2017*, 8. https://doi.org/10.3389/fpsyg.2017.01731.

Hackett, P. M. W. (2018a). Declarative Mapping Sentence Mereologies: Categories From Aristotle to Lowe. In P. M. W. Hackett (Ed.), *Mereologies, Ontologies and Facets: The Categorial Structure of Reality*. Lanham, MD: Lexington Publishers. 21st Century.

Hackett, P. M. W. (2018b). Introduction. Theoretical and Applied Categories in Philosophy and Psychology. In P. M. W. Hackett (Ed.), *Mereologies, Ontologies and Facets: The Categorial Structure of Reality*. Lanham, MD: Lexington Publishers.

Hackett, P. M. W. (2018c). Declarative Mapping Sentences as a Co-ordinating Framework for Qualitative Health and Wellbeing Research. *Journal of Social Science & Allied Health Professions., 2*(1), E1–E6.
Hackett, P. M. W. (2019a). Facet Mapping Therapy: The Potential of a Facet Theoretical Philosophy and Declarative Mapping Sentences Within a Therapeutic Setting, Frontiers in Psychology, Section Psychology for Clinical Settings. https://doi.org/10.3389/fpsyg.2019.0122.

Hackett, P. M. W. (2019b). Declarative Mapping Sentences as a Co-ordinating Framework for Qualitative Health and Wellbeing Research. *Journal of Social Science & Allied Health Professions, 2*(1), E1–E6.

Hackett, P. M. W. (2020a). MS Pocket.

Hackett, P. M. W. (2020b). *The Complexity of Bird Behaviour: A Facet Theory Approach*. Cham, CH: Springer.

Hackett and Schwarzenbach. (2020). Black Lives Matter: Birdwatching in Central Park and the murder of George Floyd. In P. M. W. Hackett & C. Hayre (Eds.), *Handbook of Ethnography in Healthcare Research*. London: Routledge.

Hackett, P.M.W., Sepúlveda, J., & McCarthy, K. (2011). Improving Climate Change Education: A Geoscientific and Psychological Collaboration. In Y. Fisher, S. L. Hans, V. J. Bernstein, & J. Marcus (Eds.), (1985). *Some Uses of the Facet Approach in Child Development*, In D. Canter (Ed.), (1985) *Facet Theory: Approaches to Social Research* (pp. 151–172). New York: Springer.

Hackett, P. M. W., Schwarzenbach, J. B., & Jurgens, A. M. (2016). *Consumer Psychology: A Study Guide to Qualitative Research Methods*. Leverkusen: Barbara Budrich Publishers.

Hackett, P. M. W., Lou, L., & Capobianco, P. (2018). Integrating and Writing-up Data Driven Quantitative Research: From Design to Result Presentation. In P. M. W. Hackett (Ed.), *Quantitative Research Methods in Consumer Psychology: Contemporary and Data Driven Approaches*. London: Routledge.

Hans, S. L., Bernstein, V. J., & Marcus, J. (1985). Some Uses of the Facet Approach in Child Development. In D. Canter (Ed.), *Facet Theory: Approaches to Social Research* (pp. 151–172). New York: Springer.

Havlíček, T., & Hupková, M. (2013). Sacred Structures in the Landscape: The Case of Rural Czechia. *Scottish Geographical Journal, 129*(2), 100–121. https://doi.org/10.1080/14702541.2012.754931.

Health and Safety Executive. (2019). Work-Related Stress, Anxiety Or Depression Statistics In Great Britain. [online] Retrieved from https://www.hse.gov.uk/statistics/causdis/stress.

Henderson, V. (1991). *The Nature of Nursing: a Definition and its Implications for Practice, Research, and Education: Reflections after 25 Years*. New York: National League for Nursing Press.
Ives, B., Olson, M. H., & Baroudi, J. J. (1983). The Measurement of User Information Satisfaction. *Communications of the ACM, 26*(10), 785–793.

Kaplan, M. A. (1964). *The Conduct of Inquiry: Methodology for Behavioral Science*. San Francisco: Chandler Publishing Co.

Kim, S., Phillips, W. R., Pinskiy, L., Brock, D., Phillips, K., & Keary, J. (2006). A Conceptual Framework for Developing Teaching Cases: A Review and Synthesis of the Literature Across Disciplines. *Medical Education, 40*, 867–876.

Klein, H. J., & Delery, J. E. (2012). Construct Clarity in Human Resource Management Research: Introduction to the Special Issue. *Human Resource Management Review, 22*(2, SI), 57–61.

Klima, E. (2011). *Przestrzeń religijna miasta*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego.

Koval, E. M., Hackett, P. M. W., & Schwarzenbach, J. B. (2016). Understanding the Lives of International Students: A Mapping Sentence Mereology. In K. Bista & C. Foster (Eds.), *International Student Mobility, Services, and Policy in Higher Education*. Hershey, PA: IGI Global Publishers.

Lange, D. (2008). A Multidimensional Conceptualization of Organizational Corruption Control. *Academy of Management Review, 33*(3), 710–729.

Levett-Jones, T., Hoffman, K., Dempsey, J., Jeong, S. Y., Noble, D., Norton, C. A., Roche, J., & Hickey, N. (2010). The ‘Five Rights’ of Clinical Reasoning: An Educational Model to Enhance Nursing Students’ Ability to Identify and Manage Clinically ‘At Risk’ Patients. *Nurse Education Today, 30*, 515–520.

Levy. (1990).

Lincoln and Guba. (1985).

Locke, E. A. (2012). Construct Validity vs. Concept Validity. *Human Resource Management Review, 22*(2), 146–148.

Lou, L., & Hackett, P. M. W. (2018). *Qualitative Facet Theory and the Declarative Mapping Sentence, Contemporary Data Interpretations: Empirical Contributions in the Organizational Context*. Paper Presented at, Organization 4.1: The Role of Values in Organizations of the 21st Century.

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct Measurement and Validation Procedures in MIS and Behavioral Research: Integrating New and Existing Techniques. *MIS Quarterly, 35*(2), 293–334.

Marcum, J. A. (2012). An Integrated Model of Clinical Reasoning: Dual-Process Theory of Cognition and Metacognition. *Journal of Evaluation in Clinical Practice, 18*, 954–961.
Mauffette-Leenders, L. A., Erskine, J. A., & Leenders, M. R. (2005). *Learning with Cases* (3rd ed.). London, Ontario: Richard Ivey School of Business.

McGrath, J. E. (1968). *A Multi-Facet Approach to Classification of Individual Group and Organizational Concepts*, in *People, Groups, and Organizations* (pp. 191–215). New York: Teachers College Press.

McGrath, J. E. (1984). *Groups: Interaction and Performance*. Englewood Cliffs, NJ: Prentice-Hall.

Ministry of Justice. (2020, March 21). Her Majesty’s Prison And Probation Service (HMPPS) Workforce Statistics Bulletin. [online]. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886194/HMPPS-workforce-publication.pdf.

Oppy, G. (1991). On Davies Institutional Definition of Art. *The Southern journal of philosophy*, 29(3), 371–382.

Osigweh Yg, C. A. B. (1989). Concept Fallibility in Organizational Science. *Academy of Management Review*, 14(4), 579–594.

Oxford Reference. (2020). Institutional Theory of Art. Retrieved from https://www.oxfordreference.com/view/10.1093/oi/authority.20110803100005387.

Petter, S., Straub, D., & Rai, A. (2007). Specifying Formative Constructs in Information Systems Research. *MIS Quarterly*, 31(4), 623–656.

Polit, D. F., & Beck, C. T. (2010). Generalization in Quantitative and Qualitative Research: Myths and Strategies. *International Journal of Nursing Studies*, 47(11), 1451–1458. https://doi.org/10.1016/j.ijnurstu.2010.06.004.

Proudfoot, J., Klein, B., Barak, A., Carlbring, P., Cuijpers, P., Lange, A., Ritterband, L., & Andersson, G. (2011). Establishing Guidelines for Executing and Reporting Internet Intervention Research. *Cognitive Behaviour Therapy*, 40(2), 82–97.

Przybyska, L. (2014). *A Mapping Sentence for the Process of Sacralisation: The Case Study od Gdynia, Prace Geograficzne, zeszyt 137,. Kraków, PL: Instytut Geografii i Gospodarki Przestrzennej UJ*. https://doi.org/10.4467/20833113PG.14.012.2157.

Rothmann, S., & Coetzer, E. P. (2003). The Big Five Personality Dimensions and Job Performance. *Journal of Industrial Psychology*, 29. https://doi.org/10.4102/sajip.v29i1.88.

Schwab, D. P. (1980). Construct Validity in Organizational Behavior. *Research in Organizational Behavior*, 2, 3–43.

Schwarzenbach, J. B., & Hackett, P. M. W. (2015). *Transatlantic Reflections on the Practice-Based Ph.D. in Fine Art*. New York: Routledge Publishers.
Shkoler, O., Rabenu, E., Hackett, P. M. W., & Capobianco, P. M. (2020). *International Student Mobility and Access to Higher Education* (Marketing and Communication in Higher Education). Basingstoke: Palgrave Macmillan.

Shye, S., Elizur, D., & Hoffman, M. (1994). *Introduction to Facet Theory: Content Design and Intrinsic Data Analysis in Behavioral Research*. Thousand Oaks, CA: Sage Publications, Inc.

Skilton, P. F. (2011). Getting the Reader to ‘I Get It!: Clarification, Differentiation and Illustration. *Journal of Supply Chain Management, 47*(2), 22–28.

Soljan, I. (2012). *Sanktuaria i ich rola w organizacji przestrzeni miast na przykladzie najwiekszych europejskich ośrodków katolickich*. Kraków: Instytut Geografii i Gospodarki Przestrzennej UJ.

Stecker, R. (1986). The End of an Institutional Definition of Art. *British Journal of Aesthetics, 26*(2), 124–132. https://doi.org/10.1093/bjaesthetics/26.2.124.

Straub, D., Boudreau, M.-C., & Gefen, D. (2004). Validation Guidelines for IS Positivist Research. *Communications of the Association for Information Systems, 13*(1), 24.

Suddaby, R. (2010). Editor’s Comments: Construct Clarity in Theories of Management and Organization. *Academy of Management Review, 35*(3), 346–357.

Townsend, A., Cox, S. M., & Li, L. C. (2010). Qualitative Research Ethics: Enhancing Evidence-Based Practice in Physical Therapy. *Physical Therapy, 90*(4), 615–628. https://doi-org.ezp.lib.cam.ac.uk/10.2522/ptj.20080388.

Theije de M. (2012). Reading the city religious: Urban transformation and social reconstruction in Recife, Brasil. In R. Pixten & L. Dikomitis (Eds.). *When God comes to town: Religious traditions in urban contexts* (97–113). New York: Berghahn Books.

Weber, R. (2012). Evaluating and Developing Theories in the Information Systems Discipline. *Journal of the Association for Information Systems, 13*(1), 1–30.

Wihlborg, J., Edgren, G., Johansson, A., Sivberg, B., & Gummesson, C. (2019). Using the Case Method to Explore Characteristics of the Clinical Reasoning Process Among Ambulance Nurse Students and Professionals. *Nurse Education in Practice, 35*, 48–54.

Wixom, B. H., & Todd, P. A. (2005). A Theoretical Integration of User Satisfaction and Technology Acceptance. *Information Systems Research, 16*(1), 85–102.

Wollheim, R. (1987). *Painting as Art*. Princeton: Princeton University Press.
Yaniv, E. (2011). Construct Clarity in Theories of Management and Organization. *Academy of Management Review, 36*(3), 590–592.

Youngs, D. (2013). *Behavioural Analysis of Crime: Studies in David Canter’s Investigative Psychology*. Farnham: Ashgate Publishing Company.

Zelinsky W. (2010). Organizing Religious Landscapes. In M. P. Conzen (Ed.) (pp. 253–278). New York, London.

Zhang, M., Gable, G., & Rai, A. (2016). Toward Principles of Construct Clarity: Exploring the Usefulness of Facet Theory in Guiding Conceptualization. *Australasian Journal of Information Systems, 20*. https://doi.org/10.3127/ajis.v20i0.1123.