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Basden, A and Joneidy, S

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DOOYEWEERD'S UNDERSTANDING OF MEANING (2): SOME IMPLICATIONS

Andrew Basden
University of Salford, Salford, United Kingdom
work@kgsvr.net

Sina Joneidy
University of Teesside, Middlesborough, United Kingdom
s.joneidy@gmail.com

Abstract

Meaning is important in everyday life, and each science focuses on certain ways in which reality is meaningful. This article (the second of two) discusses practical implications of Herman Dooyeweerd's understanding of meaning for everyday experience, scientific theories, scientific methodology, and philosophical underpinning. It uses eight themes related to meaning in Dooyeweerd's philosophy, which are discussed philosophically in the first article (and summarised here). This article ends with a case study in which the themes are applied together to understanding Thomas Kuhn's notion of paradigms.

Keywords

1   Introduction

Meaning is very important in Dooyeweerd's philosophy, yet Reformational philosophy has seldom discussed it, and even Dooyeweerd did not clearly elaborate what *meaning* means. He used the terms *meaning*, *meaningful*, etc., 3,077 times in his *A New Critique of Theoretical Thought* (Dooyeweerd 1984).

The reason we are exploring Dooyeweerd's understanding of meaning is because we have found it extremely useful in fields in which we work—information systems, business, environmental sustainability, theology, and computer science. The companion paper (Basden 2019a) discusses how Dooyeweerd understood meaning—not only what he wrote about it but also how he used the concept. This paper discusses the usefulness or implications of Dooyeweerd's understanding in everyday life, in the sciences, and in philosophy.

A summary of the companion paper is given in section 2; readers are referred to that paper for deeper explanation and discussion. Section 2 also differentiates five ways in which we use the word *meaning*. Section 3 discusses some implications of Dooyeweerd's understanding of meaning for everyday life, including that of professional life and the academic life of scientists, researchers, and philosophers. Section 4 discusses some implications for scientific theory, and section 5, for scientific methodology.

Section 6 discusses some implications for philosophy and for philosophical underpinnings of science. Section 7 presents a case study that demonstrates how elements of Dooyeweerd's understanding of meaning may be used together to address the problem of paradigms.

This article is intended to be of interest to practitioners and scientific researchers as well as Reformational philosophers. *Science*, here, includes social, mathematical, and design sciences, the humanities, and natural sciences.

2   Meaning as Reality

This section summarises the discussion in Basden (2019a) in sufficient detail for this article. Dooyeweerd (1999, appendix) saw *meaning* as almost a synonym for *reality*. All reality is meaningful, whether of interest to humans or not. Van der Hoeven (1978) suggests that what Dooyeweerd meant by *meaning* was its "ordinary" sense, as used in everyday experience, more than its semantic sense, as used in philosophical literature.

Basden (2019a) finds it useful to differentiate at least five distinct senses of *meaning*:

- Signification-meanings of words, utterances, diagrams, etc.
- Interpretation-meanings—e.g., of scattered feathers interpreted as bird kill.
- Attribution-meanings—e.g., my grandmother's vase has special meaning for me.
- Life-meaning, the meaning of life, career, etc.
- Meaningfulness of all, whether human or non-human, which transcends the other four.

Dooyeweerd's understanding of meaning covers all of these senses, but most of his 3,000 uses of the word *meaning* refer to *meaningfulness*. This article usually employs the word *meaning* to refer to all of them undifferentiated (and also in quoted text), but uses *meaningfulness* or one of the other terms where we can be more specific.

Basden (2019a) discusses how Dooyeweerd employed meaning(fulness) throughout his philosophy, covering eight main themes of Dooyeweerd's understanding, summarised as follows.

(1) *Meaning is related to everyday experience and the pre-theoretical attitude of thought*. Dooyeweerd believed that meaning(fulness) is constitutive of everyday reality and experience (cf. the phenomenological notion of lifeworld). It is first from everyday, pre-theoretical experience that we begin to know and understand meaning.

(2) *Meaning is diverse and coherent*. In the pre-theoretical attitude, we experience diversity and coherence of meaningfulness. Whereas most theoretical thought tries to reduce diversity (see Basden 2019a), Dooyeweerd respects diversity. Yet he does so critically, always taking account of coherence of meaning. Meaningfulness has irreducibly distinct modalities (aspects, spheres), yet these cohere, in that each aspect (i) depends on others, (ii) contains analogical echoes of others, and (iii) never works against others. Aspects inherently anticipate and retrocipate each other.

(3) *Meaning has the character of referring and expressing, and implies dependency on an origin of meaning* (Dooyeweerd 1984, 1:4). All temporal reality refers to (depends on) aspects, which refer to each other, and all refer to, and depend on, a transcendent, divine origin of meaning(fulness).

(4) *Being is grounded in meaningfulness*. "*Meaning* is the *being* of all that has been *created*," wrote Dooyeweerd (ibid.), "and the nature even of our selfhood." Being is not constituted in essence nor

process nor being-in-world, but in meaningfulness: all being is "being-as"—i.e., mode of being. Being is multi-aspectual—the profile of aspects that Dooyeweerd called a *structure of individuality* is a meaning-oriented way of understanding types.

(5) *Meaning links with law, functioning, and good*. Meaningfulness implies good, each aspect defining a distinct kind of good (a way in which reality works well) and, in most aspects, a corresponding evil. Meaningfulness as good implies law; the coherence of meaningfulness is a law-side. Law is that manifestation of meaningfulness which makes functioning possible (Dooyeweerd 1984, 1:102–106), each aspect thereof offering distinct kinds of possibility (e.g., physical, technical, economic possibilities). Actualization of each kind of possibility occurs as reality functions in each aspect; this is Dooyeweerd's subject-side. All activity involves multi-aspectual functioning simultaneously. Thus, normativity and functioning, like being, arise ontically from diverse meaningfulness; this subverts the conventional separation of *is* from *ought*. Basden (2019a) suggests a model of meaning in which signification-, interpretation-, attribution-, and life-meanings all arise from meaningfulness, as we function in certain aspects.

(6) *Meaningfulness surrounds, and pervades all that is and occurs*. While meanings are generated by subjects, meaningfulness is not generated, nor is it an external *causa finalis* (Aristotle), nor an initial impetus (Bergson). Meaningfulness is *a priori* and it surrounds and pervades us and all temporal reality (subject-side). It is like an "ocean of meaningfulness" in which we exist and "swim" (cf. "dwell" in Polanyi and Prosch [1975]). Hence our deepest grasp of meaningfulness is intuitive, from functioning in each aspect. The metaphor of an ocean of meaningfulness, though not found in Dooyeweerd, has been found useful by some readers and is used below.

(7) *Meaningfulness plays three roles in theoretical thought*. Basden (2019a) reinterprets Dooyeweerd's second transcendental critique of theoretical thought (Dooyeweerd 1984, 1:34–68), to argue that meaningfulness plays a different role in each of his three transcendental problems. (a) Theoretical thought is directed towards an aspect (sphere of meaningfulness) of the world to abstract data. (b) The operation of theoretical thought requires that the coherence of meaningfulness, which is split into aspects during abstraction, be respected. The meaningfulness of each aspect is usually manifested in an irreducibly distinct rationality yet, since there is no single overriding rationality, human responsibility for harmonising rationalities is paramount. (c) All self-critique, important in theoretical thought, must refer ultimately to what is presupposed by the thinking community as an origin of meaning. These three (world, rationalities, origin of meaning) are different for each philosophy and form its distinct ground-Idea (Dooyeweerd 1984, 1:68ff.). Being grounded in prior meaningfulness, theoretical thought can never be neutral nor absolute.

(8) *How we may know meaningfulness and its aspects?* The challenge to knowing what aspects of the ocean of meaningfulness there are is that our very knowing is a multi-aspectual functioning that is enabled by the aspects themselves—how can fish understand the ocean? In his general theory of modal spheres (Dooyeweerd 1984, vol. 1, part 1), Dooyeweerd addressed this challenge by setting out principles for delineating and understanding the kernel meaningfulness of each modality (aspect): begin with intuitive grasp of kernels, listen to all thinkers, conceptualise, and test for antinomy. Additional principles are suggested in Basden (2019a). A special theory of modal spheres, of which his famous suite of 15 aspects is an initial but useful outline, is still awaited. Dooyeweerd warned that no suite of aspects, including his own, can ever claim completion (Dooyeweerd 1984, 2:556).

Reference will be made back to these themes by number—e.g., (#2), (#4). For fuller explanation and discussion, readers should refer to the companion paper (Basden 2019a). The aspects that will be referred to in this paper are:

- Quantitative: We and the world exhibit quantity, amount.
- Spatial: We and the world exhibit continuous extension and simultaneity.
- Kinematic: We and the world exhibit movement.
- Physical: We and the world exhibit energy, forces, and causality.
- Organic/biotic: We and the world exhibit body, life functions, health or disease.
- Sensitive/psychic: We and the world exhibit sense, feeling, emotion, reactiveness.
- Analytical: We and the world exhibit conceptual clarity or confusion.
- Formative: We and the world exhibit shaping, goals, achievements, history, technology, industry or laziness.
- Lingual: We and the world exhibit symbolic signification by which we "parcel up" pieces of meaningfulness.
- Social: We and the world exhibit agreement, togetherness or disagreement.
- Economic: We and the world exhibit resources, management, frugality or waste.
- Aesthetic: We and the world exhibit harmony, enjoyment, interest or boredom.
- Juridical: We and the world exhibit appropriateness, rights and responsibilities, justice or injustice.
- Ethical: We and the world exhibit attitudes of self-giving love or selfishness.
- Pistic/faith: We and the world exhibit belief, aspiration, commitment, religion, courage or cowardice.

Humans can function as subjects in all aspects, animals up to the psychic, plants to the organic, and material to the physical, but all may function as objects in any aspect (e.g., flowers are beautiful).

3   Implications for Everyday Life

This section discusses how Dooyeweerd's understanding of meaning and especially meaningfulness can be useful in everyday life—first, in general, second, in the everyday activity of professional life, and third, in the realities of scientific and philosophical activity. As explained in Basden (2019a), the words *everyday* and *pre-theoretical* are used almost interchangeably.

3.1   *Everyday Life*
Dooyeweerd argued that philosophy based on an immanence standpoint has prevented a truly sensitive approach to understanding everyday experience (#1), forcing us instead to take one sphere of meaning as our point of reference for all the others (Dooyeweerd 1984, 1:15). The harm is idolatry and/or reductionism. Dooyeweerd's understanding of meaningfulness helps us avoid this, can throw light on the complexity of everyday reality, and can help guide us in it. His suite of aspects has become a useful tool to study everyday experience (Khojah 2018; Aiyenitaju 2018).

Recent discussion of everyday experience (see section 6) may be assisted by Dooyeweerd's understanding of meaning in three ways. First, Dooyeweerd sees everyday experience as a functioning in all aspects simultaneously (#5). This offers a way to navigate its complexity, such as its multiple

normativities (#5), why people adopt multiple roles in everyday life, why artefacts designed for one thing can be used otherwise, why people can interpret things differently or attribute different meanings to things, and so on. Many examples of these may be found in Basden (2018).

Second, everyday experience involves intimate (pre-theoretical) engagement with our surrounding world which also functions with us in those same aspects (#6) by subject-object and subject-subject relationships. Our attitude of thought towards the world is, in the main, pre-theoretical (#1), though it might include analytical reflection and what Clouser (2005) calls *lower abstraction*.

Third, regarding lifestyle, the ideas that meaning refers beyond (#3) and that aspects are normative (#5) imply multi-aspectual responsibility. The metaphorical idea of an ocean of meaningfulness (#6) implies that our responsibility extends beyond human beings to all creation. This offers a sound philosophical basis for environmental responsibility (Brandon and Lombardi 2005; Basden 2017).

In professional activity and academic (theoretical) activity there is also everyday life, but it is shaped by the aspects that are particularly meaningful in these areas of life—e.g., the economic aspect in business dealings, the analytic aspect in science—and these are discussed separately.

3.2   *Everyday Experience in Professional Practice*

The everyday life of professional practice is engaged, multi-aspectual functioning, in which some aspects are treated as more important than others—the formative, economic, and juridical aspects especially. Functioning in these aspects is targeted on aspects that identify the professional practice (e.g., pistic for church, biotic for farming, formative for engineering).

Functioning in each of its aspects (#5) takes on forms peculiar to professional life. Analytical functioning is no longer just distinction making but also analysing, formative functioning is not just shaping but also planning and designing, lingual functioning comprises report writing and business communications, social functioning constitutes professional roles and relationships, and so on up to pistic functioning, which is toward formal visions and top-down motivations.

Sadly often, much of its ethical functioning is devoted, in a self-serving way, to boosting the reputation of the organisation, and much of its pistic functioning is hubris and idolatry. These are dysfunctions in these aspects which have led to failure of, for example, expensive e-government projects (Krishnan-Harihara and Basden 2010). They occur when the organisation (or person, idea, etc.) is treated as having meaningfulness in itself. Grounds for ameliorating hubris and idolatry lie in recognising the referential, dependent character of meaningfulness (#3).

A clear awareness of aspects (#2) can be useful in separating out issues or norms and clarifying relationships among them. This awareness can be intuitive or theoretical. Intuitive awareness (#6) can be helpful in professional discussions. For example, a senior manager once told me how he held the aspects at the back of his mind during business discussions, with an eye on which aspects were being discussed (e.g., economic) and which were not (e.g., ethical, aesthetic). He could then draw attention to the overlooked aspects.

A more theoretical knowledge of aspect kernels (#8) and their relationship is appropriate in analysis, presenting arguments, and planning. Gunton et al. (2017) use it in the *ecosystem valuing framework*, which argues, against the notion of *ecosystem services*, that all aspects are valuable and important, whether they serve human interests or not. Eriksson (2001) employs it to reveal unexpected failure in business. Mirijamdotter and Bergvall-Kåreborn (2006) employ it in analysing reasons for the 1994 Baltic ferry disaster. Lems (2005) uses Dooyeweerd's aspects as an avenue to water management

that takes context into account. Strijbos (2000) argues for the "disclosing" of norms. Finally, techniques for aspectual interviewing and analysis have been developed, which will be described later.

3.3   *Everyday Experience in Theoretical Life*

Likewise, Dooyeweerd recognised the pre-theoretical (everyday) nature of the activity of science, technology, research, and philosophy, which we might call *theoretical life*.

Like professional life, the aspects take on a particular profile that differs from ordinary life (#5). The analytic functioning of theoretical thinkers goes beyond distinction making, analysis, and lower-level abstraction to what Clouser (2005) calls *higher abstraction* and Dooyeweerd calls *theoretical thought* involving a *Gegenstand* relationship directed towards aspects of meaningfulness (#7)—see below.

Theoretical thinking is an "actual activity" (NC,I, 5), involving full human beings functioning in all other aspects. A meaningfulness-oriented perspective can throw light on the plethora of claims made about it. For example, when Kuhn (1962) argues that science is puzzle-solving, he is drawing attention to functioning in the formative aspect. Polanyi and Prosch (1975) draw attention to its aesthetic aspect.

As in professional life, ethical and pistic functioning too often include dysfunction in serving personal and institutional reputation. When theoretical life becomes merely a pastime of the affluent, in the face of worldwide poverty and environmental degradation, its juridical aspect becomes dysfunctional too.

Another challenge is fruitless conflicts about what something *is*. These can sometimes be resolved by recognising that the being of the disputed thing derives from meaningfulness (#4) and is multi-aspectual (i.e., multiple being).

These and many other practical issues of theoretical thought, which are made visible by Dooyeweerd's understanding of meaning, are discussed more fully in Basden (2019b).

4   Implications for Scientific Theories

Dooyeweerd's understanding of meaning has implications for the kinds of scientific theories that emerge and how they emerge.

4.1   *The Role of Meaningfulness in Science*

Dooyeweerd's clarification of the three roles that meaningfulness plays in theoretical thought (#7) (see Basden 2019a) has several implications.

Aspect of world. One aspect (or a few) defines on what it is relevant to focus (as *Gegenstand*) in studying the world and which data it is meaningful to abstract (e.g., physical for physics, pistic for theology). This helps us differentiate areas of interest and research problems within areas. It can make us alert to encroachments and reductions, and offers grounds for discussing these. How one field relates to others as reference disciplines becomes clearer, especially via the notion of neighbouring aspects (Basden 2018, 309); we can prepare our field properly to be a reference discipline to others. For instance, the information systems field focuses on the lingual aspect, with formative and social neighbouring aspects, and is a reference discipline for business.

Aspectual rationalities. Several rationalities must act in harmony in order to generate new knowledge ("findings"). These are expressed in the research methods employed, and knowledge of aspects

helps justify appropriate methods. For example, material science must reason about (i) physical laws, (ii) mathematical analysis, and (iii) planning of and errors in experiments (formative aspect).

A practical challenge in theoretical life is *category errors* (Ryle 1949). These may be detected easily and explained lucildly by an educated intuition of aspect kernels, as Dooyeweerd does with Zeno's paradox, since diversity of meaningfulness (#2) is what makes categories possible, and each aspect is irreducible to the others. Basden (2018, 67) discusses why it is reasonable to rely on Dooyeweerd's aspects.

Origin of meaning. Critique and refinement of research findings is carried out with reference to meaningfulness.

Consider the following public discussion of a piece of research:

CRITIC 1: "The author fails to consider X." (World)
CRITIC 2: "The author has not analysed correctly, and should employ research method R." (Rationality)
REJOINDER: "But X is not relevant, because Y. Method R is inappropriate because S." (On the basis of what is meaningful)
CRITIC 3: "But S/Y is inappropriate in this field, because of P." (About paradigms)
REJOINDER: "But P is the current paradigm and is not appropriate; what is being suggested is a new paradigm Q." (Paradigm shift)
CRITIC 4: "Q must be resisted/welcomed because of O." (Origin of meaningfulness)

Initially, critique refers to aspects of world and rationalities, but deeper critique refers to what the community takes as more widely meaningful, and ultimately to a religously presupposed origin of meaningfulness. We will discuss paradigms later.

4.2   *The Interest of Each Science or Discipline*

If we differentiate sciences by their central aspect of focus (aspect of world, #7), this gives each science a mandate to open up our theoretical understanding of that aspect and its laws. Table 1 shows some sciences for which each aspect is meaningful and some typical research methods, which seem to align with aspectual rationality.

[INSERT table 1 here with the following caption:]
TABLE 1 Sciences per aspect

The irreducibility of aspectual meaningfulness (#2) implies that when a science tries to encroach on other areas, or inappropriate research methods are employed, it constrains or misleads the opening up of the core aspect. Research becomes less fruitful.

Crossover sciences like biochemistry or sociolinguistics focus on two aspects of the world, while interdisciplinary research and disciplines find even more aspects important. As the contributors to Strijbos and Basden (2006) demonstrate, Dooyeweerd's approach can offer a much-needed, sound philosophical basis and practical guidance for full "integrated" interdisciplinarity, which is only rarely achieved. Discussion and guidance therein can be enriched by a clear understanding of aspectual irreducibility and coherence (dependencies, analogies, and non-conflict) (#2).

4.3   *Developing Theories in the Sciences*

Scientific theories increase in complexity as they mature, being exposed to, or tested against, reality. This complexity may be understood by Dooyeweerd's suggestion that being, functioning, and normativity all have their roots in meaningfulness (#4, #5).

Here is an example drawn from Basden (2018). Information theory began with a concern for the faithful transmission of messages through a noisy medium, and Shannon (1948) reduced this to distinguishing intended messages from those corrupted by noise—the analytic aspect. Wiener (1948) saw information as a capacity for useful work—the formative aspect. Shannon explicitly excluded semantics and the realities of sender and receiver of messages, but the science of hermeneutics is concerned with the semantic level of the possibility of misunderstanding, and with human processes of interpretation—the lingual aspect. Gadamer (1966, 7) argued that "a common understanding always precedes these situations" of communication—the social and lingual aspects. Floridi (2004) remarked that "information is still an elusive concept" and that "the philosophy of information (PI) is a new area of research with its own field of investigation and methodology." He devised 18 "open questions" for the philosophy of information, which cover the psychic, analytic, and formative aspects, with a little of the lingual. The systems field discusses capta, data, information, and knowledge (Checkland and Holwell 1998) in a way that aligns these with psychic, analytic, formative, and lingual aspects, and treats each as emerging from the previous one by processing. Tuomi (1999) argued that knowledge precedes data (cf. aspectual retrocipation).

Confusion marks the field. It is clear that many treat information as substance. However, if we begin from meaningfulness (#4) and ask which aspects each thinker finds meaningful in the information world (#7), as inserted above, we might obtain a comprehensive understanding that embraces all the above in one coherent picture (#2).

Other fields where a Dooyeweerdian approach has brought clarity include statistics (Hartley 2008), tacit knowledge (Kimani 2017), sustainability (Brandon and Lombardi 2005; Gunton et al. 2017; Basden 2017), and technology (Verkerk et al. 2015).

5   Implications for Research Methodology

This section discusses how Dooyeweerd's understanding of meaning can contribute to (scientific) research methodology. Dooyeweerd encourages certain attitudes to research and enriches methods of data collection and analysis. In all three, the various elements of Dooyeweerd's understanding of meaning have several implications.

In brief, the assumption of this paper is that the main role (meaningfulness) of research as a whole, across all sciences, is to build humanity's bodies of theoretical knowledge. Research contributes findings (beliefs about how reality works in selected aspects thereof), which the research community critiques and refines until it deems it reasonable to rely on them.

5.1   *Attitudes to Scientific Research*

Attitudes to research and beliefs about the role of research, and of the researcher in the research, apply throughout the research (including data collection and analysis) and flavour it. This may be understood as the retrociprocatory effect of ethical and pistic aspects on the other aspects (#2).

For example, since meaning always refers beyond (#3), research should always be seen in context. This is obvious in applied research, but what is the context of pure research? Dooyeweerd's distinction

between law-side and subject-side (#5) offers insight. In applied research, the context is its subject-side. In pure research, the context is the law-side as a coherence of meaningfulness—all the other aspects. So all fields should take account of other fields.

Similarly, because he took the coherence of meaning as a starting point (#2), Dooyeweerd argued that the researcher (scientist, philosopher) is no "detached observer" but is always within the world that is being researched as engaged, participative thinker. Both world and researcher are surrounded-pervaded by the same ocean of meaningfulness (#6). This implies that theoretical thought inherently can never be neutral and that research will always be biased. Different kinds of bias arise from the three roles meaningfulness plays in theoretical thought (#7): from deeming certain aspects of the world meaningful to be abstracted, deeming certain aspectual rationalities to be employed, including sometimes metaphors, and deeming certain spheres of meaningfulness valid for critique—and, in all three, bias comes from excluding other aspects (spheres). This contrasts with Husserl, who hoped to circumvent bias, and with Habermas and Foucault, who, though they accepted bias, believed it to arise from communicative actions or a power-knowledge nexus and thus to be largely contingent. Dooyeweerd, in taking the diversity of meaningfulness seriously and in delineating its aspects, offers a useful conceptual tool with which to investigate and manage some of these kinds of bias and non-neutrality.

The idea that the same ocean of meaningfulness is prior to all (#6) has several other implications. It leads us to dig beneath the surface of published output of research, to understand the deeper meaningfulness underneath. For example, Joneidy (2015) used Dooyeweerd's idea of meaningfulness in analysing seminal papers to reveal motivations (see below) so as to critically examine whether they are truly seminal and suggest new, fruitful avenues of research.

This oceanic idea of meaningfulness encourages, and gives a philosophical foundation for, cross-cultural research. What is said or written (signification-meanings) does not translate well across cultural barriers (Blommaert 2005), so misunderstandings might occur; but if both researcher and those being researched function within, and are surrounded by, the same spheres of meaningfulness (#6), we may expect at least some degree of mutual understanding, especially at the intuitive level at which we grasp aspect kernels (#8).

Now we will discuss how some of these points work out in data collection and analysis.

5.2   *Some Implications for Data Collection*

The purpose of interviews, surveys, text analyses, prototypes, observations, experiments, and thought experiments is to collect data on what is meaningful in the situations being studied. Several implications of Dooyeweerd's understanding of meaning have been discussed, especially in relation to interviewing.

Winfield (2000; see also Winfield, Basden, and Cresswell 1996; Winfield and Basden 2006) employed Dooyeweerd's suite of aspects (#8) in eliciting expertise from experts in various fields ranging from veterinary practice to halal food laws, and Kane (2006) employed them to help students speak about their aspirations and challenges in learning about information technology. Both used open interviews and would begin by presenting the interviewee with a list of Dooyeweerd's 15 aspects and simple explanations. They let the interviewee decide which aspects were meaningful (in their expertise, aspirations, or experiences), and the interview proceeded by responding to what the interviewees said and delving more deeply. After some time, the interviewer would ask whether there were other aspects that the interviewee felt to be important. Kane also invited them to speak about things that did not fit into any aspect.

The findings of both Winfield and Kane about using Dooyeweerd's aspects are very interesting; they address several well-known challenges to the interview process. The risk of overlooking much that is relevant may be reduced by freeing interviewees to speak about all aspects of their everyday activity (#1). The challenge of uncovering what is meaningful, which is often hidden behind, and sometimes masked by, what is said, is addressed by focusing interviewees on meaningfulness rather than on signification-meanings (#5). Both Winfield and Kane found that interviewees can readily understand Dooyeweerd's aspects directly, as long as an intuitive rather than strictly conceptual approach is taken (#6, #8). They also found that interviewees tended to cover nearly all aspects before they finished (#2); and it was very rare for interviewees to mention issues not fitting any aspects. Thus, researcher bias towards certain aspects was lessened. Aspects helped both interviewer and interviewee to dig deeper. Winfield observed that using the aspects was effective and efficient in eliciting tacit knowledge. Kane noted that using the aspects freed interviewees to mention things they assumed were trivial or embarrassing. Perceived or actual power imbalance or class barriers often restrict what interviewees say (Mellor et al. 2014); but with aspects, meaningfulness is treated as shared equally by interviewer and interviewee (#6). The interviewer-interviewee relationship becomes closer and trust increases.

There has been little discussion on how Dooyeweerd's ideas relate to collecting data in the natural or mathematical sciences, which are not about human situations, and the data of which are not couched in what people say. Nevertheless, similar challenges remain, often unrecognised, taking different forms. Which kinds of data are collected depends on which aspects of the world are deemed relevant. Frequently, confusion reigns, which might be ameliorated by understanding Dooyeweerd's aspects (#8). For example, we might expect quantum theory to centre on the physical aspect, but much of it makes no reference to energy or causality and is meaningful in the spatial and kinematic aspects. Moreover, some quantum theorists talk of "information," too readily importing meaningfulness of concepts from the lingual aspect when they should be referring to a physical analogy of the lingual. Furthermore, the multi-aspectual functioning (#5) of quantum researchers affects the theories they develop—Bohr, for instance, was a "dilettante" who disliked mathematization of physics (Fruppier 2011, 535; that kind of dislike is)belief: pistic functioning.

These examples are discussed more fully in Basden (2019b). Whatever the source of data, Dooyeweerd's understanding of meaning can bring clarity and offer new methods; however, much has yet to be explored.

5.3   *Some Implications for Analysis*

Analysis (by scientists or philosophers) interprets the collected data to generate new knowledge. Analysis is guided by two of the three roles meaningfulness plays in theoretical thought—rationalities and origin of meaning (#7). Reformational researchers have developed analytical approaches based on Dooyeweerd's understanding of meaning.

Goede and Basden (2016) propose that Dooyeweerd's aspects (#2, #8) may be used to operationalise Strijbos's (2000) idea of normative disclosure.

Practical analysis methods have also been developed. Ahmad (2013; see also Ahmad and Basden 2013) suggests a technique using Dooyeweerd's aspects to analyse interview data to find the "down-to-earth" issues around use of information systems in organisations. Down-to-earth issues are issues that are meaningful in everyday activity (#1), contrasting with "high-level" issues like cost, power, or technical sophistication, which are of interest to management, academics, or information technology suppliers. Khojah (2018) and Aiyenitaju (2018) have developed this to find down-to-earth issues in the use of

medical records in hospitals, and in the use of information technology by primary school teachers. Unlike Winfield and Kane, Ahmad, Khojah, and Aiyenitaju did not use aspects during interviews but employed aspects to analyse interview transcripts. Relevant excerpts from transcripts were analysed by considering which aspects make the excerpts meaningful, taking into account, not only the semantics of words, but also the pragmatics of why utterances occurred (#5). As examples, Table 2 shows two excerpts from Ahmad (2013) along with her aspectual interpretations.

[INSERT table 2 here with the following caption:]
TABLE 2 Example of interview transcript analysis using aspects

Some aspectual issues are explicit (*ex*) in the text in table 2, and some are deduced (*de*)—for example, juridical responsibility and pistic commitment. Such deductions can be valid, as not merely products of the analyst, when they are made by reference to aspects of prior surrounding meaningfulness (#6) rather than to interpretation-meanings by the analyst.

The use of aspects in analysis helps in several ways. It helps to clarify what makes each utterance of the interviewee meaningful and stimulates thinking more deeply about it. It draws attention to meaningful issues that might ordinarily be overlooked (#6). It allows reasonable deductions to be made that do not depend on the analyst having experience of the situation. Aspects can help classify diverse issues (#2). Thus, some forms of researcher bias are reduced.

A similar approach may be used in analysing texts, such as from papers. Joneidy (2015), Joneidy and Basden (2018), and Joneidy and Burke (2018) have been able to reveal hidden motivations of authors of seminal papers in two fields; see later.

Khojah (2018) and Aiyenitaju (2018) take this further with the help of aspects (#8). They distinguish issues mentioned in direct answers to interviewer questions from "extra" issues that interviewees add voluntarily via stories, opinions, etc. Arguably, these extra issues are more meaningful to the interviewees than direct answers, and hence analysis of the extras offers a way to lessen the influence that the interviewer has on the interview (another source of researcher bias).

6 Implications for Philosophy and Philosophical Underpinnings

Basden (2019a) shows how Dooyeweerd's understanding of meaning (especially meaningfulness) pervades most, or all, of his philosophy. Therefore, if Dooyeweerd's philosophy is to engage with mainstream philosophies and contribute to them, then his understanding of meaning is likely to be central to this engagement. The aim of engaging with mainstream discourses is not to destroy nor to replace, nor is it to construct better Christian thought (Klapwijk 1986), but it is to contribute to those discourses themselves (Basden 2008) by listening carefully to the discourses that are going on, affirming what is good, critiquing underlying presuppositions, and enriching them.

So, for example, we can appreciate philosophy's current discourses on everyday experience (#1) by American pragmatism, Husserl, Bergson, Heidegger, Bourdieu, de Certeau, etc., after centuries of denigrating it. We could question the appropriateness of taking philosophical thought as a starting point (#1) with which to understand everyday experience, which most such thinkers do. We can appreciate Bourdieu's (1990) wish to make practice prior to theory (#7), but side with, and enrich, de Certeau's (1984) criticism that he does not in fact achieve this. We could point out how most thinkers have tended

inexorably towards seeing everyday life through the lens of just one of its aspects—the formative in pragmatism, the organic in Bergson, the social in Husserl, the juridical in Foucault, the lingual in Bourdieu, and the aesthetic in de Certeau—thus not doing justice to the diversity and coherence of everyday experience (#2). We could then offer Dooyeweerd's understanding of meaningfulness as surrounding us (#6), his idea that everything we encounter in everyday experience is rooted in meaningfulness (#4, #5), his transcendental critique of theoretical thought as deriving from everyday experience (#7), and his principles for understanding that which surrounds us (#8).

In similar vein, we could engage with other philosophical discourses, such as on identity, including multiple identities, with Dooyeweerd's understanding of being (#4), good and evil with reference to meaningfulness (#5), ontologies (#8), and indeed on meaning itself, which the model of meaning proposed in Basden (2019a) (#5), and so on. There is considerable opportunity for Reformational philosophers to engage positively with mainstream discourses by employing Dooyeweerd's understanding of meaning(fulness).

Of more interest in this paper, perhaps, are implications of Dooyeweerd's understanding of meaning for philosophical underpinnings of sciences and disciplines. A few examples from various fields must suffice.

The field of statistics, Hartley (2008) has argued, may be understood more clearly if four main approaches are understood as emerging from various ground-motives (presupposed origins of meaning: #3, #7). Bayesian approaches seem closest to Dooyeweerd's ideas.

In the field of environmental planning, which has been dominated by the restrictive notion of ecosystem services, Gunton et al.'s (2017) Dooyeweerd-based idea of ecosystem valuing is attracting serious interest. It relies on the idea of prior meaningfulness (#6) in that each aspect offers a distinct value which pertains even if it does not directly serve human interests.

In the field of technology, Verkerk et al. (2015) discuss at length how Dooyeweerd's ideas might contribute, along with others, to understanding, teaching, creating, and guiding technology and technological development.

An example of the potential usefulness of the idea of prior, surrounding-pervading meaningfulness (#6) may be found in the fields of ecological psychology, human-computer interaction, and information systems. The notion of affordance, pioneered by Gibson (1979), accounts for what an object affords a sentient being, such as an animal climbing a rock, a person using a computing device, or a company employing information systems. Affordance raises philosophical conundrums: a property that is meaningful to the subject is located in the object and does not depend on there being a subject; how can this be? The rock exhibits the sentient property of climbability (Gibson 1979), while the computer affords mass collaboration (Zammuto et al. 2007). Descartes, Heidegger, and Merleau-Ponty can address some of the issues but none of them can address all. Dooyeweerd can. His understanding of a prior, surrounding ocean of meaningfulness (#6) explicitly allows object functioning in later aspects which are meaningful to the subject. His suite of aspects additionally offers a way to categorise affordances between and within fields (see Basden [2018, 230–232, 238–243] for a full discussion).

In fact, Basden (2018) offers a number of new frameworks for understanding, based on Dooyeweerd's understanding of meaning, within five major areas of the field of information systems, which ranges across the technical, cognitive, and social sciences. They include the following, with indications of which themes are employed:

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Commented [Nexus 1020]: Perhaps it would be wise to consistently refer to the eight main themes of Dooyeweerd's understanding of meaningfulness as themes rather than elements, to avoid confusion. See also my comment in table 3. Or do you use "elements" at some point(s) to refer to something else?

AB: Yes, we can replace elements by themes. HOWEVER, please also replace the preposition: "elements of" should be "themes in" where it occurs - including earlier.

There might be one place where "elements" is still preferred,. If I can find it I will tell you.

- A new understanding of technology and its role, which incorporates but also extends some insights of Heidegger (#3, #6).
- A new understanding of information (see above) and of computers (#4).
- Computer programs as virtual law-sides and as performance art (#5).
- A fresh understanding of artificial intelligence, which might bring fruitful outcomes to the debate on the differences and similarities between humans and computers (#7, #5, #2).
- A more comprehensive understanding of the use of computers and information and communications technology as three intertwined multi-aspectual engagements (with technology, with meaningful content, and in life), which integrates nearly 20 disparate discourses that are isolated from each other (#1, #2, #5).
- A new understanding of technological features and their design in which a Dooyeweerdian understanding of meaningfulness allows the theory of affordance to be integrated with normative theories of appropriateness, both being multi-aspectual (#6, #5, #2, #1).
- A view of information systems development, not as mere processes or people to manage, but as four interlocking responsibilities, in each of which every aspect is important (#5, #1, #2).
- An understanding of the widespread impact of information technology as amplified repercussions and normativity in each aspect (which can tackle surveillance, addiction, and climate change) (#5, #2, #7, #8).
- An understanding of the interaction between information technology and society as two *Umwelten* that are qualified by different aspects and which affect each other in a multi-aspectual inter-*Umwelt* relationship (#3, #4, #2).
- An understanding of the role of the information systems field in terms of meaningfulness—as mandate with dignity, destiny, and responsibility given by the lingual aspect (#2, #6).

Some of these frameworks draw on the work of others who have used Dooyeweerd, such as Schuurman (1980), while others are new. Some required a rethink of traditional interpretations of Dooyeweerd's ideas. Readers are referred to Basden (2018) for full accounts of each.

Basden's approach comes across as rather piecemeal and, in attempting to cover such a wide field in one volume, it cannot always provide depth. Basden does admit this, however: many of his ideas are initial suggestions, and, calling on others to develop them, he offers over 100 suggestions for specific research projects that arise from the frameworks.

A more integrative, extensive, and deeper application of Dooyeweerd's ideas has been undertaken by Chaplin (2011). Chaplin focuses on the single issue of social structures, especially the state. In everyday experience we encounter organised communities as exhibiting an internal unity. Chaplin shows how Dooyeweerd accounts for this, in terms of neither substance nor aggregations of individual functioning, but in terms of *individuality structures*. This "not only successfully avoids the pitfalls of both (methodological and ontological) individualism and collectivism" but also links "normative design of social structures" very closely with the functioning of their members (Chaplin 2011, 105). Chaplin offers very useful discussions on the state, business, etc., which make important contributions in several fields.

Unfortunately, Dooyeweerd saw individuality structures as invariant laws, given by the creator. Since it seems untenable to demand that all social structures are invariant, Chaplin offers a reformulation, suggesting that "the term *invariant* structural law could then be dispensed with and replaced with a notion of normative imperatives grounded in and directed to this given, stable, but dynamically unfolding, created structure of the human person" (Chaplin 2011, 106).

But how may we understand the stability and dynamic-unfoldingness of this "structure of the human person"? Chaplin does not say. Fortunately, Dooyeweerd has answered this question in saying that meaning(fulness) is the being of all, including the human selfhood (Dooyeweerd 1984, 1:4). Basden (2019a) explains how meaningfulness defines good (Chaplin's normative imperatives) and, in its guise as law, enables dynamism (#4, #5). It is the modalities of meaningfulness (aspects) that are most deeply invariant, and it is these on which individuality structures depend (as profiles of aspects). Might it be useful to define two types of individuality structures—deeper ones that are profiles of meaningfulness, and dynamic ones that are profiles of attribution-meanings? This might account for some of the types of social institutions that cannot be treated as invariant.

7   Case Study: Understanding Paradigms

Whereas sundry individual implications of elements of Dooyeweerd's understanding of meaning(fulness) have been presented above, the following case study illustrates how all elements may be employed together to bring fresh insights into an ongoing discourse. This is an initial proposal, to be developed further.

The popularity of the term *paradigm* originates with Kuhn's ([1962] 1996) ground-breaking book *The Structure of Scientific Revolutions*. Though influential in the philosophy of science, and intellectual life more generally, considerable confusion remains, which Dooyeweerd's understanding of meaning might alleviate.

7.1   *The Idea of A Paradigm*

Kuhn proposed that science progresses not only through gradual growth of knowledge (which he called normal science), but also through *scientific revolutions*, in which one paradigm displaces another—for example, the shift from Newtonian to Einsteinian mechanics. A *paradigm* is a consensus among practising scientists about solutions to central problems of their field, often couched as exemplars. A new paradigm allows new research questions to emerge and new theories to be generated. Though Kuhn discusssed fields in the natural sciences, we can find the impact of Kuhn's work in many fields (Hollinger 1973), including sociology (Burrell and Morgan 1979).

Commitment to a paradigm is derived from scientists' training and values, not from critical testing. Normal science operates under the guidance of a dominant paradigm until scientists reach a point of chaos. Then a revolutionary switch to a new paradigm occurs. Paradigm shifts do not occur on the basis of reason alone.

Despite its wide use, the idea of paradigm has caused considerable difficulty in the philosophy of science, some arguing, for example, that Burrell and Morgan misunderstood Kuhn. Kuhn himself changed his views in response to criticism. A discussion of Kuhn's ideas by Popper, Lakatos, Feyerabend, Masterman, and others is collected in Lakatos and Musgrave (1970). Kuhn's paradigms resemble Lakatos' *research programmes*, in which a core set of beliefs and assumptions is retained (and protected by tacit agreement), and Feyerabend's *worldviews*, which he defines as "a collection of beliefs, attitudes, and assumptions that involves the whole person, not only the intellect, has some kind of coherence and universality, and imposes itself with a power far greater than the power of facts and fact-related theories" (Feyerabend 1994 152)).

Masterman argues that Kuhn's notion of paradigm is ambiguous and confusing, finding 21 different ways in which Kuhn used the term *paradigm*. "Given the diversity of conceptions of paradigm," Masterman (1970, 65) asks, "is there anything in common between all these conceptions?"

7.2   *Paradigms as Meaningfulness*

Might the challenges to the Kuhnian idea be addressed using Dooyeweerd's understanding of meaning(fulness)? We can see similarities with Dooyeweerd's view that theoretical thought involves the whole person, is non-neutral, and expresses diversity and coherence of meaning (Dooyeweerd 1984, 1:3–5).

The proposal here is that paradigms are defined by meaningfulness. Paradigms express what it is meaningful for scientists to consider and do, and how the community should critique ideas (the three roles meaningfulness plays in theoretical thought—#7). The feeling of difference between paradigms may be accounted for by reference to their finding different aspects meaningful, which are irreducibly distinct in their meaningfulness and laws. For example, Einsteinian mechanics may be distinguished from Newtonian by taking better account of the kinematic aspect. Operating within a chosen or assumed paradigm is a pistic commitment to that paradigm.

The prior surroundingness of meaningfulness (#6) implies that a new paradigm expresses an aspect of its diversity (#2) that had previously been overlooked in the dominant paradigm. The chaos felt under the dominant paradigm emerges from real functioning in overlooked aspects that could not be explained.

7.3   *The Meanings of* Paradigm

If a paradigm governs what its thinkers find meaningful, then the 21 uses of the paradigm concept found by Masterman (1970) may be seen as expressing either various elements of its meaningfulness, or the complexity of the multi-aspectual, everyday activity (#1) that is operating within the paradigm. Table 3 shows how each of the 21 uses may be understood either as an expression of an element of Dooyeweerd's understanding of meaning (*column 3*) or as an aspect of the functioning that is operating within a paradigm (*column 4*).

[INSERT table 3 here with the following caption:]
TABLE 3 Dooyeweerdian understanding of 21 uses of *paradigm*

Thus, Dooyeweerd's understanding of meaning might integrate most of these uses of the word *paradigm*.

So we see that several parts of Dooyeweerd's understanding of meaning might enable us to offer both a clear (yet not oversimplified) and rich (yet manageable) understanding of paradigms, both as governing scientific activity in a field and as within a wider context. It promises to be applicable to many kinds of science, including the social sciences.

A fuller, though earlier, discussion of paradigms in the information systems field may be found in Joneidy (2015).

7.4   *Discourses and Perspectives*

We may go further. If paradigms are centred on meaningfulness, then we should be able to understand how they link with other things that arise directly from meaningfulness, including perspectives and discourses.

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Commented [Nexus 1026]: See my comment in table 3.

AB: Yes; as comment above, replace "element" by "theme" except where I indicate, as in the previous one. Remember to replace the preposition too: "of" by "in"..
Thank you.

At the macrolevel, we may see things like Taylorism in business as a paradigm that restricts what is meaningful, specifically resources (economic aspect) and control (formative aspect), and a Dooyeweerdian approach can help escape this in several ways. It can explain the paradigm's limitations in terms of aspects that are deliberately ignored. It can explain the anti-Taylorist reactions that have occurred, as emphasising some of these ignored aspects. It can offer normative guidance on how business may operate, from the norms of all aspects. Likewise, feminism may be understood as a genuine attempt to call humanity's attention to overlooked aspects. For example, Adam (1998) argues that, traditionally, what we call the masculine aspects (analytic, formative, economic, and juridical) have been emphasised at the expense of other important aspects of life, to which feminism now draws our attention: the biotic, social, aesthetic, and ethical aspects.

At the microlevel, we may use Dooyeweerd's understanding of meaning(fulness) to study discourses that arise in a field; for example, medical records (Joneidy and Burke 2018) and information systems (Joneidy and Basden 2018). These studies propose that discourses in a field arise, as do paradigms, because a group of people find certain things meaningful, and this meaningfulness is expressed via the signfification-meanings of what is discussed. The importance (meaningfulness) of each discourse may be explained by its revolving around a core aspect (or unique pairing of aspects, in the latter study), which may be identified by a systematic aspectual analysis of seminal papers. When two discourses revolve around the same aspect, they often feel akin and often refer to each other. For instance, in information systems, six discourses are identified: prediction of acceptance (quantitative-economic), multi-dimensionality (analytical-formative), how people use features (formative-lingual), benefits in use (economic-ethical), resistance and non-use (social-juridical), and use in all areas of life (social-aesthetic).

Approaches to a field may be understood as aspects of (ways of seeing) the field. They sometimes arise when the community begins to recognise discourses as addressing different aspects. Earl's (2001) seven approaches to knowledge management in organisations offers an example where each approach may be aligned with aspects that make it meaningful, as shown in table 4.

[INSERT table 4 here]
TABLE 4 Earl's seven approaches to knowledge management, and the aspects that make them meaningful

Since most approaches clearly align with a single, different aspect, and aspects are fundamentally irreducible in meaningfulness, this implies that Earl's classification might be well founded and robust. Classifications where aspects overlap might prove less robust.

Sometimes approaches are presumed to be mutually incommensurable. Eriksson (2003) argues that the presumption of incommensurability between hard, soft, and critical systems thinking arises from the ground-motive of nature and freedom. However, Basden (2011) argues that the three equivalent approaches in information systems research—positivism, interpretivism, and criticalism—may be successfully integrated by thinking in terms of meaningfulness rather than ground-motives. A comparison of the ground-Idea components (i.e., world, rationality, and wider meaningfulness; #7) of each approach finds different aspects meaningful—hence, they can contribute together to the wider whole that is research.

7.5   *Conclusion of the Case Study*
This shows briefly how a meaningfulness-oriented approach can help to understand Kuhn's notion of paradigms and to see how paradigms relate to discourses, perspectives, and approaches, and how they

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might be integrated. Each of the elements of Dooyeweerd's understanding of meaning has played a part in this. The case study needs deeper discussion, yet it already demonstrates how Dooyeweerd's understanding of meaning can be useful in each of the ways suggested in previous sections.

8   Conclusion

This article has reviewed some useful implications, for the sciences and for practice, of Dooyeweerd's understanding of meaning, which is extensively discussed in the companion paper (Basden 2019a). Every portion of Dooyeweerd's understanding has been found useful, most of which apply across the entire range of science—from mathematics and the natural sciences to cognitive, social, and societal sciences. The following shows the number of times each element of Dooyeweerd's understanding of meaning has been referred to above as having implications:

(1) Meaning and everyday experience: 10 times.
(2) Diversity and coherence of meaning, including suite of aspects: 21 times.
(3) Meaning as referring and dependence: 7 times.
(4) Being grounded in meaningfulness: 10 times.
(5) Meaningfulness as good, law; functioning, also model of meaning: 22 times.
(6) Prior, surrounding-pervading ocean of meaningfulness: 19 times.
(7) Role of meaningfulness in theoretical thought: 19 times.
(8) Knowing surrounding meaningfulness and delineating aspects: 11 times.

The relative counts do not matter because the implications discussed above are not an unbiased sample. What does matter is that every element has proven to have multiple implications for everyday experience, scientific theories, scientific methodology, and philosophy.

In his foreword to *A New Critique*, Dooyeweerd (1984, 1:vii) wrote:

> I am strongly convinced that for the fruitful working out of this philosophy, in a genuinely scientific manner, there is needed a staff of fellow-labourers who would be in a position independently to think through its basic ideas in the special scientific fields.

Given the discourses that are developing around meaning in mainstream philosophies and sciences, the time might now be right for Dooyeweerd's ideas to be explored, applied, and recommended in many fields with cautious confidence.[1]

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[1] We would like to tThanks are due to the reviewer who suggested reorganising the paper around areas of implication, making it much more understandable, and Ron Grace whose valuable comments forced us to rewrite some unclear portions.

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