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The Problem of Relevance

by

John W. Davie

A Thesis
Submitted to the Faculty of Graduate Studies and Research
through the Department of Philosophy
in Partial Fulfilment of the Requirements for
the degree of Master of Arts at the
University of Windsor

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2005

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Abstract

My project is a systematic inquiry into the problem of relevance, which has been identified as an enduring difficulty in, for example, informal logic and information science where it plays a fundamental role in argument and information searches, respectively. My first task involves determining exactly what the problem of relevance is. To achieve that, I collected problem statements from the literature but I also analysed literature on relevance to discover further problems. The key problem that I investigate concerns the question, 'What is relevance?', which I take to concern the meaning and occurrence of relevance. Concerning the semantic question, I suggest that it demarcates a point of time prior to asking it. Subsequently, I identified and evaluated approaches to elucidating the notion of relevance, rejected intuitionism and stipulation as suitable approaches, and selected philosopher/physicist Mario Bunge's approach to scientific philosophy and his conceptual system to frame my study. I also assess potential information sources; rejected constructed examples that prove to be contrived or are used to illustrate a stipulated definition; and selected dictionary definitions, actual statements, and carefully constructed examples as information sources to complement my review of the literature on relevance. To elucidate relevance, I traced the concept back to its Greek roots, analysed statements, and concluded that the term 'relevance' since its inception in Scottish law in the early 1500's has been limited largely to relations of significance. Understanding relevance in terms of both connection and significance is crucial to construct, identify, or evaluate relevance statements and thereby develop a representative theory of relevance. It also provides a solution to many controversies such as degree of relevance and it helps elucidate notions such as strength and sufficiency of an argument. I suggest that as significance can vary in degree, so too can relevance but a connection between objects is presupposed in both cases. Strength is a measure of significance and sufficiency is the strength required to establish a conclusion. Finally, I offer a provisional and partial theory of relevance where I summarize my prior analyses and integrate/comment on published positions on relevance.

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Mario Bunge's work has been of utmost importance to my intellectual development. In spirit, I thank him for the clarity, depth, breadth, cogency, and fruitfulness of his insights. Without his work, I would have laboured much longer and harder than I did.

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Special Symbols

Logical Symbols

IR_t	= Irrelevant.
$IR_{t \rightarrow}$	= Irrelevant to .
IR_v	= Irrelevance.
P_r	= Probability.
R_n	= Relation.
R_t	= Relevant.
$R_{t \rightarrow}$	= Relevant to.
R_v	= Relevance.
\rightarrow	= 'if-then', as in ' $a \rightarrow b$ ' or 'if a then b '.
$d \rightarrow$	= Determines; as in, ' $a d \rightarrow b$ ' or ' a determines b '.
$De \rightarrow$	= Designates the concept or set of concepts; as in, ' x designates any individual'.
$Rf \rightarrow$	= Refers to; as in, ' $a Rf \rightarrow b$ ' or ' a refers to b '.

Grammatical Conventions

'x'	= a term or constructed statement enclosed in single quotation marks (excludes mention of the concept or occurrence of relevance).
"x"	= a quotation enclosed in double quotation marks.
[330-390]	= dates of birth and death.
(1962-2004)	= range of publication dates.
(2003)	= single publication date.
(1996: 14)	= date and page of publication
(14)	= page number for the immediately preceding literature citation.
(14.1)	= page number and whole or partial paragraph number for the immediately preceding literature citation.

1.0 Introduction

To set the stage for subsequent chapters I will provide a general overview of the nature of my thesis, a sketch of each chapter, an initial outline of the meaning of 'relevance', a set of key terms and definitions that underlie all subsequent sections, and a brief outline of the dynamics of symbolic representation.

My thesis is a systematic inquiry into the problem of relevance. By 'problem of relevance' I mean a subject of inquiry that includes a set of unresolved issues concerning the term/concept 'relevance'. I use the phrase also to indicate a primary emphasis on problem. As an inquiry, my thesis follows a particular process and perspective and employs particular expressions. Specifically, it begins with and is framed by a set of questions. These questions lead to the identification, analysis, and evaluation of issues and related standpoints. Because analysis and evaluation are essentially disassembly and sorting operations, they determine which pieces belong or do not belong to a particular puzzle, so to speak. However, as pieces lying on a table, they do not provide a clear, overall picture. For that, synthesis is needed to assemble the pieces into a coherent whole. As a *systematic* inquiry, my thesis includes, as prominent elements, (i) the identification, analysis, and evaluation of problems, approaches, and perspectives; (ii) the application of a particular perspective and approach; and (iii) the presentation of a partial and provisional account of relevance. Given that these elements form an integral whole, where problem determines approach and both determine the account, I treat problem-solving as an iterative process where approach is taken as a test of problem identification/assessment and the account is taken as a test of its precursors. Also, my account is partial because it is based on a sample of the literature. It is provisional because it is partial. As such, I recognize that other literature and future work might require additions and/or revisions to the account.

A systematic inquiry differs from an argument that starts with and is framed by a thesis statement. Such a statement expresses a stand taken on an issue and leads to a proof or confirmation of the thesis. If counter-arguments are entertained, then the argument is framed more broadly by the issue. Although I employ arguments, an inquiry results in a different overall structure that includes assessment of problem and approach, implementation of approach, and presentation of a proposed solution.

In Chapter 2, I begin with a general analysis of the problem and I identify and assess published statements concerning the problem of relevance. In Chapter 3, I consider the inventory of

problems identified in Chapter 2 and select ones to investigate. The next step involves identifying the essential nature of the problem, which is crucial because it determines both approach and the relevance of potential information sources. I then identify and evaluate approaches to the problem and information sources, rule out those that I consider less preferable based on their potential to solve problems, and select the approach and information sources that I prefer. Chapters 4 and 5 are parallel, so to speak, in that they both concern the implementation of approach. Specifically, they concern the problem of what ‘relevance’ means and both chapters contain analyses and evaluations of semantic accounts of relevance. Chapter 4 focuses on historical and contemporary dictionary definitions and usage of the concept of relevance, as revealed by the use of various terms. Chapter 5 concerns two generic accounts of relevance published in the philosophic literature. My intent for both chapters is primarily to discover the basic concept of relevance as revealed by generic definitions that contain different expressions aimed at identifying essential or prominent conditions of the concept, as opposed to specific definitions that identify types of relevance relations or judgments. Even so, I continue to search for and find obstacles that hinder, or potentially hinder, the development of an account of relevance. I propose solutions to some of these problems in Chapters 4 and 5 but a few require extended analysis and evaluation. I deal with these larger issues in Chapter 6, which also involves analysis and evaluation. The issues include the relation between the generic concept of relevance and the concepts of relation, degree of relevance, and strength and sufficiency of an argument. In Chapter 7, I outline a general theory of relevance that I offer as a partial and provisional account. In doing so, I summarize the findings from Chapters 2 to 6 concerning problems and approaches. I also pick up the pieces of the puzzle from these chapters that concern the question, ‘What is relevance?’ I take this question to concern the meaning of ‘relevance’ and occurrence of relevance. I focus on the semantic question and suggest that it delimits a time frame prior to the point of time it is asked. However, to understand this question and my approach to it, a basic understanding of the notion of relevance and a familiarity with the terms I employ are required.

In providing a basic understanding of relevance, an initial obstacle is encountered because the meaning of ‘relevance’ is one of the problems to be solved. Defining it now would present my findings prematurely and could give the impression that I am arguing rather than inquiring. So, I offer the following tentatively and with the proviso that it will be explained in greater detail throughout the thesis. First, we need to recognize that relevance is an existing term constructed by

humans to represent a corresponding mental object and both the term and mental object have a further representational function in designating a referent. Currently, the general sense assigned to the term ‘relevance’ is that it concerns an association between at least two objects. Determining what those objects and associations are is one of the main tasks of my thesis.

The special terms employed throughout my thesis are taken largely from the work of scientist/philosopher Mario Bunge. These terms represent a system of basic philosophic concepts developed by Bunge through a scientific approach to philosophy, as I detail in Section 3.2.4. They are unique to his particular philosophic view and ought not to be confused with other definitions of the same terms. Because the system spans semantics, ontology, epistemology, technology, and ethics, summarizing the system is not possible in a few paragraphs. However, I can provide a brief outline of the basic terms/concepts that underlie my analyses, evaluations, and synthesis. But I should warn that such a brief account is very sensitive to articulation and prone to misinterpretation, particularly if the reader understands the concepts from other perspectives and particularly since Bunge reforms those conceptions. Further, I have adopted the principles and basic elements of Bunge’s semantic and ontologic system but I classify the elements and name some of the classes differently. For example, Bunge limits the notion of construct to conceptual objects, which are mental objects such as concepts, propositions, and theories. That is, he groups these mental objects under the term ‘construct’. In contrast, I use the term ‘representational object’ and include conceptual objects within that category along with other mental and non-mental representational objects. Hence, the difference is only one of how the elements are grouped. The fundamental ontological and epistemic principles remain the same. To prevent confusion, I will present definitions of the terms (in bold) as I articulate them and do so without comparing them to Bunge’s definitions. In any case, I remain faithful to Bunge’s basic intent to provide a conceptual system that is not factually incorrect.

The most basic term is **object**. It includes whatever can exist, be thought about, talked about, or acted upon. All objects are concrete/material **things** like atoms, persons, and artifacts; systems of things; properties and states of things; or changes to those properties. A **system** is composed of at least two associated objects. For example, sodium and chloride ions combine to form the molecular system that we call table salt. The class object is conceptually divided into two sets of objects: representational and non-representational objects.

Representational objects are emergent properties of constructed or generated things or

systems of things. They include the representational element of (i) sensations, which are constructed for us; (ii) mental objects like percepts, which are also constructed for us; (iii) mental objects like concepts and propositions, which are linguistic objects that we cognitively construct; and (iii) artifacts like letters, terms, and sentences, which are first conceived and then constructed with material objects. A **constructed object** (e.g., a thought or a hair) is produced through the cognitive or non-cognitive acts of an organism, whereas a **generated object** is produced through an abiotic event (e.g., combination of sodium and chloride ions, which are non-living entities). Two types of representational objects are **mental objects**, which are emergent properties of a brain (e.g., concepts), and **non-mental objects**, which occur outside the brain (e.g., physical letters). As such, **linguistic objects** can be either mental (e.g., concepts) or non-mental (e.g., letters).

Concepts are linguistic, mental objects constructed through brain processes and are the basic units that constitute a **proposition**, which is a conceptual system. In contrast, physical/non-mental **letters** are linguistic things that constitute (i) **terms**, which are letter systems, and (ii) **sentences**, which are term systems. To be economical, I use the terms **word** and **statement** ambiguously to designate a term/concept unit and a sentence/proposition unit, respectively. These linguistic objects constitute part of a **semiotic system**, which also includes humans who use such objects to think and communicate within a community of other humans. Both mental and non-mental linguistic objects are **symbols** in that they have a representational function. As such, their counterpart is a **referent**, which can be either another conceptual object, non-conceptual representational object, or a non-representational object. Because we can think without employing concepts, another term is required to identify this category of mental object. To test this claim try to find an object without thinking with words. Doing so might be difficult but for a person like Grandin (1995), who is an autistic scientist/engineer, thinking primarily in pictures and having to translate language to pictures comes naturally. I will use the terms **idea** and **ideal** to designate this category, although they can be associated with a complex and problematic history, which I would like to avoid. The need for the category also arises because various words and statements can be employed to express the same idea. Words and statements do so because physical and mental symbols afford such flexibility and variability. So, where various terms/concepts or sentences/propositions can be reduced to the same idea, I call the expression a **basic term/concept** and **basic sentence/proposition**, respectively.

Non-representational objects include all other properties of generated or constructed

things as well as non-representational things. I also use **fact** to designate the same category. To understand the essential difference between facts and representations is to understand the difference between an imaginary rock that a 'human' can easily 'cast' across the 'universe' and a physical rock that cannot. This difference is one of fundamentally different properties. Examples of facts include (i) a post, which is a non-representational thing in a particular state at a given time and (ii) a post with an octagonal shaped sheet of metal with the physical letters 'STOP' on it, which is a representational thing. But 'fact' does not include the meaning of the letters 'STOP'; i.e., its representational dimension. Similarly, a brain process/state is a fact but the concept 'stop' that emerges as a result of that process/state is the representational element of that fact/state.

In terms of cognitive dynamics, the constructive process of representation involves concept formation, term construction, establishment of a mutual referential relation between concept and term, and establishment of a referential relation between the concept/term unit and another conceptual or non-conceptual object, which is based on a crucial evidential link to the referent. These relations are not matters of law but rather convention. Such processes may be described and definitions may be constructed to articulate referential relations but doing so is not necessary for the occurrence of the basic representational process. Such a process has occurred in relation to the conception of relevance, although it initially occurred centuries ago. To illustrate the process, I will present a biological example because it illustrates how a concept can be systemically situated.

Suppose I see an insect of a new species, conceive of the name *Drosophilia canadensis* to represent it, construct and arrange letters to create a physical representation of the conceived name, and decide to associate the name with the insect. Being in a community of other entomologists, I want to communicate to others what I mean by *D. canadensis*. So, I place the term within an existing hierarchy of terms that compose a biological classification system; i.e., the Phylum Arthropoda, Superclass Hexapoda, Class Insecta, Subclass Pterygota, Order Diptera, Family Drosophilidae, and Genus *Drosophilia*. Doing so, efficiently provides a great deal of information about *D. canadensis* that leads to a greater understanding of it than a description would alone. Nonetheless, specific information is needed to identify it so that it can be distinguished from others in the same genus. That requires using conventional terms to describe the essential characteristics of the insect, which creates a mutual referential relation between the definiendum, *D. canadensis*, and its definiens, the description of its essential characteristics. If other entomologists read my writing, establish the same set of referential relations that I have constructed, and accept my terms

and their relations, the word becomes established by convention in the community of entomologists.

Three significant points ought to be emphasised. First, linguistic objects are representational devices. In that sense, the representation depends on both the referent and evidence we obtain from it. In terms of representation, this relation is similar to a copy that depends on its original. This is not to say that symbols represent objects analogically or pictorially. Rather, they are more like digital codes. The accuracy in matching representation to referent is a matter of truth. Second, mental representations, unlike their physical counterparts, can be assembled through combination or reasoning and disassembled through analysis and distinction in ways that their physical counterparts cannot, as our imagination and falsities attest. Third, as constructions, mental representations serve a purpose. Two are of importance to the problem of relevance. One is the intent to symbolically represent objects as they exist which yields (i) an identification and description of individuals and (ii) a classification of how things are naturally structured, which concerns the identification of natural kinds and systemic levels. These constructions are evaluated primarily on the basis of truth (the referent-representation relation) but, because expression is always a concern, they are also evaluated on the basis of how well they serve a cognitive goal. The other is the intent to meet other cognitive goals (e.g., to understand) or pragmatic goals (e.g., to find food). This yields a non-natural or conventional classification system. For example, plants can be represented pictorially and these pictures can be organized by way of flower colour as opposed to natural kinds based on their evolutionary/genetic relations. Such a system facilitates the identification of plants and subsequent activities such as removing a weed from a garden. As such, a conventional system is evaluated on the basis of both truth and convenience.

With the preceding semantic/ontologic outline, we can move to the labourious task of sorting out 25 centuries of various terms and expressions advanced in various languages to identify and elucidate whatever we currently designate by 'relevance'. Once we identify terms, examine the variety of expressions that have resulted from usage and definitions, and identify referents, we can reduce various definitions and statements to a basic concept or proposition. Thereafter, we can readily identify relevance statements, determine why they are correct associations, describe when they go wrong, and develop procedures to guide the construction, analysis, and evaluation of relevance statements. In the end, we will have the rudiments for a general theory of relevance. But, first, we need to be clear on why all this needs to be done. This takes us to researchers' consideration of what the problem of relevance is.

2.0 Problem Analysis

The topic of relevance has been explicitly addressed by researchers from a variety of perspectives including argumentation theory, informal logic, formal logic/relevance logic, fallacy theory, rhetoric, neuropsychology, cognition, communications, pragmatics, artificial intelligence, knowledge/information systems, and law. Despite hundreds of articles on and definitions of 'relevance', many researchers maintain that relevance remains a difficult problem to solve, which is paradoxical given that we make relevance judgments almost always and we likely do so correctly the vast majority of times. That is, any time we construct physical and/or mental associations, we create what is or what we take to be a relevance relation. If we were not successful in doing so, we could not perceive correctly, think coherently, communicate effectively, or function in a world that demands correct associations. To support this claim requires appeal only to common experience and the idea of correct association. Think of deciding when to wake in the morning, what to eat, how to answer a question, or what is required to start your car. Such constructed associations have likely been made by humans ever since humans developed rational capabilities. Further, relevance relations have not just been utilized but they have also been recognized, named, and discussed since at least ancient Greek times.

This contrast between theory and practice suggests that the problem of relevance is the problem to solve. That is, I suggest that the door to its solution is opened by insight into the nature of the problem and the path to solution is provided by approach. The first task is to determine exactly what problems occur. Some researchers identify and discuss problems and I have collected, analysed, and assessed these in following sub-section. However, most just propose solutions to an implied problem. In any case, proposed solutions can be evaluated to determine how doors may have been or can be closed, inadvertently or otherwise. Accordingly, my search for problems carries through to subsequent chapters where I analyse and evaluate proposed solutions. Further, I suggest that the assessment of both problem and approach must be continuous with problem-solving. However, we do not always know exactly what a problem is until we have solved it and see that the solution works. Determining that a solution works is easy with mechanical problems (an engine does not run) but not so easy with conceptual and some theoretical problems. Hence, I provide a partial/provisional general theory of relevance, which can be used as a test of problem assessment and approach, and I suggest that the theory be evaluated on the basis of its coherence, factual correctness, and application to other problems.

2.1 Problem Statements from the Literature

The following is a sample of problem statements that I will analyse and evaluate to identify problems from which I will formulate specific research objectives and determine if any obstacles occur from researchers' perceptions of the problem.

In 2003, through correspondence, R.H. Johnson suggests that the "problem for the theory of argument/informal logic is that relevance is put forth as a criterion for premises and yet there is not a coherent story about it in LSD [*Logical Self-Defense*]. The problem is that no one has yet come up with an analysis of relevance which yields anything like a useful and specifiable process/method for determining relevance."

In 2003, M. Lipman, in a book on critical thinking, says that relevance is a "fairly fuzzy notion".

In 2001, T. Anderson, in an article on information retrieval decisions, says that information researchers are still trying to understand what relevance means for individuals who search for information and how they make such judgements.

In 2000, R.H. Johnson, in a book on argumentation theory, says that nothing is more basic to reasoning/ argumentation than relevance, yet it has been "strongly resistant to analysis".

In 2000, B. Horjland, in proposing a solution to the 'relevance problem' in information science, says, "Considering the huge amount of research done with the relevance concept... it is almost unbelievable that such simple and important issues as presented here have hitherto been missing." Those "issues" concern his proposal to shift researchers' perspective from relevance to non-relevance and to consider the epistemic basis of relevance judgments.

In 1997, S. Mizzaro, after reviewing about 160 articles on relevance in information science, says that relevance is not a well understood concept despite it being one of the central concepts, if not *the* central concept, for documentation, information science, and information retrieval.

In 1996, T. Sarasevic, in a critical review of relevance research in information science, says that, despite some studies in philosophy, communications, logic, and psychology, relevance is a notion that has not attracted wide theorizing. He speculates reasons to be that the notion is difficult to deal with and rather narrow. Further, being intuitive, handy, widely used, and primitive, the term and notion is used in the explication of many other phenomena and notions.

In 1996, L. Schamber, in a methodological paper in information science, suggests that the main problems for researchers include defining relevance, identifying the range of factors contributing to relevance judgments, and developing techniques to quantify relevance judgments.

In 1995, D. Sperber and D. Wilson, in a book on the communicative and cognitive aspects of relevance, state that 'relevance' is a "fuzzy term, used differently by different people or by the same people at different times... There is no reason to believe that a proper semantic analysis of the English word 'relevance' would also characterize a concept of scientific psychology." In developing such a concept, they maintain that the "fact that there is an ordinary language notion of relevance with a fuzzy and variable meaning is a hindrance rather than a help."

In 1994, J. Woods, from the perspective of argumentation theory/informal logic, considers the notion of relevance to be the most intuitive within the family of argumentation concepts. He also

thought that none is worse off theoretically because no one has developed a theory of relevance, which leaves us without knowing what relevance is.

In 1994, T. Froelich, in a review of relevance research in information science, suggested that relevance is the most fundamental concern in information science yet highly debated.

In 1974, M. Bunge, in a treatise on philosophy, comments that, despite the popularity of 'relevance' in philosophic research, it is not always identified as a relation.

In 1947, A. Naess, in a book on semantics and argumentation, claims that the initial decision to include an argument for or against a standpoint depends on determining degree of relevance, which is ultimately intuitive. One can only 'feel' such relevance. Even so, he suggests that at an advanced stage we might be able to replace intuition with an explanation but not entirely so.

2.2 Summary and Discussion of Problem Statements

This sample of problem statements provides a clear sense that relevance is an important and fundamental concept but problematic. The two main difficulties identified in most of the statements generally concern semantic and methodological problems. Specifically, they involve defining 'relevance' and/or understanding its meaning and determining how to evaluate relevance claims or presuppositions. But how is that relevance remains a "fuzzy notion" as Lipman (2003) claims; "poorly understood" as Anderson (2001) and Mizzaro (1997) claim; or intuitive or unexplained as Naess (1947), Sarsevic (1996), Sperber and Wilson (1995), and Woods (1994) claim, when hundreds of articles and definitions have been published in the last half of the 20th century? Perhaps the nature of semantic problem has not been adequately understood, an incorrect approach to it has been taken, or information sources have been inappropriate. Perhaps the hundreds of accounts and definitions, dozens of related terms in ordinary language, and countless expressions have just obscured what 'relevance' means. We find ourselves, as Socrates would say, in the confusion of variability and we are like drunkards swirling in confusion. That variability is like a movement and we need to, as Plato would say, tie 'relevance' down.

I suggest that the problem is not as Sarsevic (1996) might be suggesting - one that needs more extensive research of the same kind - but rather one of clarification. Specifically, we need to examine various expressions as found in definitions and ordinary usage, determine the basic concept that the term 'relevance' designates so that we can (i) collect a representative sample of the concept's usage, including usage as designated by synonymous terms and expressions, (ii) identify referents, and (iii) describe and classify relevance statements and their referents. Then, we can develop a general theory of relevance.

At variance with my suggestion, Sperber and Wilson (1995) dismiss semantic analysis as a means relevant to their project of developing a psychological notion of 'relevance'. However, they have not conducted a semantic analysis to justify its dismissal, nor have they speculated reasons why it ought to be dismissed. As they admit, the fuzzy notion is a hindrance and they must rely on intuitive means to identify relevance relations, which they acknowledge is problematic (119.6). In highlighting this point, I do not mean to imply that their account of relevance is intuitionist, as outlined in Section 3.2.2, or that it is necessarily corrupted by mistaken relevance claims. The main point is that, if we open the door to semantic analysis, we can see what results from it and then determine whether or not it can provide help in developing a psychological concept of relevance, or any other particular type of relevance relation. In initiating that analysis, we can be encouraged by Aristotle who said that one way to know something is by its genus, which is characterized by a set of properties common to all types. For example, if a biology student has never heard of the pika and you tell her that it is a lagomorph or member of the rabbit family, knowing any of the essential features of this class would tell her a lot about the pika. Even so, further description of features common to all pikas is required for her to distinguish the pika from other species in the class. A difference between the two cases is that we have at least a vague idea what relevance is, whereas the biology student is unfamiliar with pikas. Nonetheless, the point concerns what we can know or understand about a class by its genus. My suggestion is that, through a semantic analysis, we can attempt to discover the generic concept of relevance. If successful, this provides us with the essential conditions that all types satisfy and helps us understand the types better because we know what is common to them. Further, if we can determine the characteristics common and exclusive to each type, we can develop a systematic understanding of relevance, which we currently lack.

I favour essentialism despite philosophers, like Wittgenstein, who claim that some concepts are family resemblance concepts. First, I suggest that we should try to define concepts systematically before suggesting that it does not apply to relevance. We can be encouraged by the success of essentialism in the sciences through which the periodic table, biological classifications, and quantitative concepts have been developed or in music where note duration and pitch have been specifically and systematically defined. Without being essentialist, scientists would not be able to consistently identify respective instances by way of these concepts and musicians would not be able to play together with harmonious results. This is not to say that identifying essential conditions is easy, always possible, or even accomplished when someone thinks it has been accomplished.

3.0 General Approach and Perspective

The statements outlined in Chapter 2 have provided an indication that two main dimensions of the relevance problem concern semantics and method. Each provides a broad frame within which specific research questions can be formulated and then analysed to determine their nature. From these analyses, potential approaches and information sources can be identified and evaluated. Then, an appropriate approach and information source can be selected. I present the research questions in Section 3.1 and the analyses and evaluations in Sections 3.2 and 3.3. In Section 3.1, I also present the initial frame of the study that I developed after reviewing a range of the literature on relevance from a variety of disciplines. In Section 3.2, I discuss why a multi-disciplinary approach is required to develop a generic definition of ‘relevance’, which is inclusive of types of relevance, and a corresponding general theory of relevance.

3.1 Research Objectives

The initial frame of the study was composed of the following tasks:

(I) Summarization/Analysis of Existing Literature on Relevance.

- Distinguish accounts of relevance (generic) from types of relevance judgments/statements.
- Identify, outline, and compare accounts of relevance and types of judgments/statements.
- Develop an overall synthesis of current accounts.
- Identify and explain issues.
- Identify and explain key areas requiring further work.

(II) Identification and Assessment of Approaches/Methods Utilized to Elucidate Relevance

- Determine goals or why accounts of relevance have been developed.
- Determine how the problem of relevance has been conceived.
- Identify and assess approaches/methods employed in the literature.
- Determine the nature/kind(s) of problem encountered (e.g. normative, descriptive, etc.).
- Identify methods available to address such problems.
- Determine how best to address the problem or problem types.

This initial frame provides a perspective and indication of the background work that has informed my report. In particular, I have reviewed and analysed a wide range of literature on relevance from argumentation theory, informal logic, rhetoric, formal logic/relevance logic, fallacy theory, lexicography, psychology/cognition, communications, artificial intelligence, knowledge/information systems, law, and foundations of science. However, my thesis is limited to the following general questions, with greatest emphasis on the first three.

- What is relevance?
- What is the problem of relevance?
- How do we determine what relevance is?
- How do we make relevance judgments or evaluate relevance claims?

Even within this more limited scope, space and time restrictions require me to select key examples of the literature to illustrate some main themes of my research. Being limited to elements selected from various articles, no implications beyond these elements are intended. Further, because my emphasis is on the semantic dimensions of relevance, I have omitted literature that concerns the development of symbolic languages and algorithms. Finally, the study is framed by the scientific and systematic philosophical perspective developed by Mario Bunge, which I will elaborate on in the next section. Because his work is extensive, I can only sketch main elements both related to my study and necessary to provide a general perspective.

3.2 Methodological Considerations

In this section I outline specific background considerations and the general approach I take to analyse and evaluate previous usage and elucidations of relevance and to develop an account of my own. My purpose here is to sketch and briefly discuss two alternative approaches to address the question of what relevance is - stipulation and intuitionism . The latter is based on different basic postulates from those of Bunge's scientific philosophy. I do not intend to refute these alternative positions. Rather, I intend only to indicate why I have not followed them and why I prefer Bunge's approach. Any competition between positions is not an issue that I address in this thesis. However, I suggest that positions ought to be evaluated by comparing the account of relevance developed from each. Finally, I will outline information sources that have been used to elucidate 'relevance', rule out some, provide reasons for doing so, and indicate the sources that I will utilize.

3.2.1 General Considerations Concerning the Question, 'What is relevance?'

Why ask the Question? As detailed in Section 4.2, the term 'relevance' has occurred in the English language for at least 500 years, the concept has been recognized since at least ancient Greek times, we frequently make relevance judgements with relative ease, and plenty of definitions are readily available. However, if a person wants to know precisely what 'relevance' means and looks it up in one of Merriam-Webster's current dictionaries, he would read that relevance is "a relation to the matter at hand". This definition is not particularly useful because we need to

determine what kind of relation ‘relevance’ designates, why no first relatum is specified, and what exactly ‘matter at hand’ means. Definitions of these terms lead to more vaguely defined terms and then on to more terms, which might also be vaguely defined. Or, we get taken back to relevance empty-handed, so to speak, when a definition of a later term makes use of ‘relevance’. (Please see Sections 4.3 and 4.4 for detailed analyses.) Even specialized definitions make use of synonymous phrases like ‘has a bearing on’ (Blair 1989), or ‘speaks for or against’ (Naess 1947) to indicate the meaning of relevance. This indefiniteness invites us to examine definitions of ‘relevance’ and attempt to develop a systematic definition. In this regard, my concern is primarily with a generic definition that encompasses all types of relevance relations.

To be more concrete, I will outline an analogous biological example to illustrate what I mean by the problem of indefiniteness and the solution of systematic definition. Suppose that you are novice gardener in a conversation about gardening with more experienced gardeners. The unfamiliar name ‘*Glechoma hederaceae*’ is mentioned. You recognize it as a plant but do not know precisely what it is. So you ask, ‘What is it?’ The answer to this question differs from the answer to the question of what relevance is because a precise, systematic framework is available to situate the conception of the plant but is available not for relevance. The biological framework is a result of hundreds of years of collecting, describing, and classifying plants. Also, specimens of the plant can be reliably identified and shown to someone because the essential conditions needed to distinguish it from other plants are known. In contrast, we are unsure of the essential conditions of the generic concept of relevance. As a result, what it delimits is not precisely known and we cannot be certain that we have identified a particular instance, as will be discussed in Section 6.1 when considering whether or not relevance is any relation or a particular kind of relation. Also, we cannot be sure that we have identified a representative sample of all instances of relevance to develop a general theory. Further, numerous definitions have been developed for the generic concept and even more for some types of relevance (e.g., premise relevance, information retrieval relevance). These confound the identification of instances because they delimit different classes, unless the definitions are just synonymous expressions and the sets completely overlap. Even so, numerous expressions are confusing until an analysis is done to determine that the expressions are equivalent. Different definitions that delimit different classes result in different membership of each class even though all share the same class name. If the class is large and the members are varied, a complex classification system is possible for each definition. That is, numerous classification

systems could be developed. I suggest that what we need is a Copernican solution to Ptolemaic problem, which means we need a new look at the referents of relevance statements and a simpler and systematic representation of them.

The kind of answer we want for the relevance question is similar to what would be provided for the plant. We want a detailed description, classification, and theory. Specifically, *G. hederaceae* would be identified as a plant in the mint family and further taxonomic information could be provided for it. It would be described as an aromatic, perennial evergreen plant that prefers moist shady areas and reproduces by underground stems called rhizomes. A picture or specimen of it could be shown and more detailed descriptions of it could be provided to distinguish it from other plants. Also, one of its many common names (synonyms) such as creeping charley or ground ivy could be mentioned. Its evolutionary history could be described as could the dynamics of its recent distribution. That is, we would say that it was originally native to Europe but is now naturalized in North America. I obtained this information, and more, in about 10 minutes through an internet search. In contrast, I have spent two years trying to determine what relevance is and I will use most of this thesis in an attempt to elucidate what it is.

Nature of the Question. I suggest that the question ‘What is relevance?’ expresses a factual and a semantic question. The factual question is ‘What is the occurrence of relevance?’ It concerns acts such as relevance judgments and goal directed behaviour. The semantic question, which is my principal concern, is ‘What does ‘relevance’ mean?’ The semantic question concerns the concept of relevance and its term, where the latter is an indicator of the former. Both are representational objects. Hence, the semantic question concerns referential relations that have been established for both, where such relations establish the meaning of the term and concept. Other types of meaning can be associated with the term and concept. However, referential relations are my only concern. Grasping the meaning of relevance is required to identify instances of the concept’s use when ‘relevance’ terms are not used; to model relations between objects identified by a relevance statement; and to evaluate the correctness of a term’s usage. The precision of the definition determines how well we are able to perform these tasks.

The term ‘relevance’, the concept relevance, and their referential relations come into existence through constructive, cognitive acts. Hence, all have a temporal dimension. The semantic question also has a temporal dimension in that it demarcates a point in time when asked. Thus, I suggest that the semantic question is initially and necessarily a contemporary-historic question.

'Relevance' terms exist now and through these we refer to their contemporary meaning. Further, they have existed for at least 500 years (Section 4.2), have been communicated in such a way that each term/meaning unit remained more or less stable, and other English speakers accepted and continued to use the terms as such, at least sufficiently long to become established in the language. In any case, time always passes after invention and acceptance. Similarly, if someone asks 'Where do you live?', you would not answer by indicating what future residence you would like to have. Your answer would identify your current residence, which you have previously occupied.

I also suggest that the semantic question encompasses historical meaning that can be either communal or peculiar. Lexicographers, by and large, attempt to discover and report on communal meaning when developing a dictionary. Nonetheless, individuals have the freedom to attach special meaning to the terms, as misuse, irony, stipulations, and codes indicate.

Overview of a General Approach to the Question. Asking why the semantic question is asked and determining its fundamental nature is crucial to determining an approach to it. First, determining what relevance is requires initially determining what 'relevance' means, as explained in the previous paragraph. Doing so requires determining the historical senses assigned to or implied by the term 'relevance' and its relatives. Arranging the terms hierarchically assists our understanding of the basic concept. Completing these tasks establishes a systematic, semantic framework. Two data sources needed to complete this work include dictionaries and actual statements that contain the terms or otherwise refer to the concept. Second, because various expressions can refer to the same basic statement, definitions and similar statements must be reduced to that basic statement. Doing so can be difficult when definitions contain terms not systematically defined. Third, definitions and statements must be analysed to determine their structure. Fourth, the essential semantic/conceptual domain of each element of that structure must be determined. When aggregating these elements, the semantic/conceptual domain of the term as a whole can be determined. Finally, referents and their relations must be identified and modelled. Below, I elaborate on the main points.

Structure and Function. Outside concept formation, our first point of contact with the concept of relevance is through a linguistic system (e.g., a sentence) that contains the term 'relevance' or one of its relatives. Such systems are constructed when elements are arranged in a way that conforms to grammatical convention. As such, syntax provides a perspective to understand one aspect of a relevance statement. In Sections 4.3 and 4.4., I outline the essential

structure of a relevance statement, which includes at least two relata, a relational term, and an indication of the direction of relation. I also discuss the issue of direction in Section 6.1.3. Grammatically, 'relevance' functions as a noun and 'relevant' functions as an adjective. Such a classification draws attention to the representational function of the terms and associated concepts and the need to identify, analyse, and model referents. In Chapter 4 and Section 6.1, I analyse definitions of 'relevance' and its relatives to identify the kinds of objects delimited by these terms.

Term/Expression versus Basic Concept/Proposition. The terms 'relevance' and 'relevant' and various expressions (e.g., definitions and statements) using such terms must be distinguished from the basic concepts that they designate. Further, related terms must be considered and these include terms that either designate the same basic concept, include the basic concept at the same or higher level of generality, or designate subtypes of the concept. In other words, the term 'relevance' must be situated within its greater semantic context, as will be shown specifically in Chapter 4.

Identifying Conceptual Elements of a Term. Because the meaning of 'relevance' is a function of its original usage and/or definition and its subsequent usage through whatever terms are used to designate it, analysis of historical definitions and usage is required to identify the basic concept of relevance, as will be shown in Chapter 4. The process essentially involves collecting a variety of expressions that employ the terms 'relevance' and 'relevant'; outlining their common structure, which for relevance includes two relata terms, a relational term, and a direction of relation; collecting definitions of relata and relational terms; identifying and modelling the referents of each term, and reducing various statements and definitions to the basic concept. Getting beyond linguistic expression to identify the basic concept can be difficult if the concept has a long history; the concept has been and is currently employed in various languages, word forms within such languages have changed (e.g., the Scottish 'releuancie') and/or the concept has shifted to different or expanded to other terms; and lexicographers themselves have not gotten beyond expression which means their definitions could present to us terminological/conceptual confusion.

Identifying Instances of Conceptual Usage. Once the basic concept is identified, its occurrence in statements and definitions can be readily identified, as can types of relevance relations or judgments. As mentioned, the first point of contact is with symbols/terms. The most obvious way of identifying the basic concept is through a term. However, a term can be misused and this can be determined by comparing its use to the essential concept previously assigned to the term. A less obvious way to identify the concept, but nonetheless important, is identifying

expressions that do not name a relevance relation, as ‘relevance’ and its relatives do, but all the same refer to the same basic concept. In other words, a term within a statement naming a relevance relation is not necessary to indicate a relevance relation. For example, Aristotle begins his *Rhetoric* with a subtle relevance statement when he writes that both rhetoric and dialectic “are concerned with such things as come, more or less, within the general ken of all men and belong to no definite science.” (Book I; 1.1.) The statement identifies the appropriate reference class of rhetoric and dialectic, from which evidence is obtained. This is a fact-concept relation that Bunge (1974) calls evidential relevance. Aristotle then complains that previous “framers” of rhetorical treatises “have constructed but a small portion of that art”, which means they have not considered all relevant evidence. Aristotle explains that rhetoric essentially concerns persuasion and he notes that, previous writers have neglected to account for the enthymeme, which is an essential means of persuasion, and have instead focussed on non-essentials. Accordingly, Aristotle concludes that arousing “prejudice, pity, anger, and similar emotions has nothing to do with the essential facts, but is merely a personal appeal to the man who is judging the case.” (Book I; 1.2). That is, Aristotle maintains that emotional appeals are outside the frame of relevance established by rhetoric as defined by its essential features.

3.2.2 Alternative Approaches to the Semantic Question

In this section I evaluate two alternative approaches to discover the meaning of relevance and rule them out as preferred approaches. My intent is not to refute any of these approaches but to specify the reasons why I did not choose them. In other words, my conclusion of preference is different from a conclusion of refutation even though someone could use my reasons to support a conclusion of refutation. I do not attempt a refutation because it would require a more extensive treatment than I can provide here. I begin by discussing stipulation, which is the most common means by which researchers have approached the semantic question (e.g., Blair 1989; Bowles 1989, 1990; Bunge 1974; Hitchcock 1992). Such definitions are often given in an appeal to the reader’s intuitions (Carey 2004; Naess 1947). However, sometimes examples that conform to the definition are constructed or found in other discourse, which can also be problematic (Section 3.3). Whether any research or what research has informed the construction of the definition is not often reported, as if such a definition is produced independently of experience.

Stipulation. Stipulation has a legitimate role in developing new meanings, which apply to

the future and are subject to others' acceptance. How widespread that meaning becomes is a function of acceptance by others, the number of others who accept it, countervailing influences, and communication factors. Further, stipulation is an important means of ensuring consistency in meaning, reasoning, and communication. For example, it can be important to isolate a particular sense within a broader context of a word's meaning (e.g., in an impact assessment, the use of 'x lumens' vs. 'bright') or select a particular sense of an ambiguous word (e.g., in relation to roughness, use of 'coarse in texture' vs. 'uneven surface').

Despite these advantages, the use of stipulation to determine the meaning of 'relevance' is problematic in several respects. First, stipulating a definition is a purposive act of construction and delimits a point in time. If the definition is not based on a term's previous usage, it is prescriptive and initially peculiar. That is, it answers the question 'What is *x*?' but it does so only for the person stipulating the definition and anyone who accepts the definition after its stipulation. So, such a stipulation is not a report/interpretation of the usage of a term that has been previously accepted by a community of language users. Second, a stipulation can assign an entirely new meaning to a term, which means that such a stipulation cannot be a correct description of past usage/meaning. For example, as noted in Section 4.2.5, Samuel Johnson constructed a definition of the English term 'relevance' based on its sense in French, not the predominant sense which was used in English by the Scots. Third, finding confirming examples of a stipulated definition is insufficient to determine the meaning of a term and identify associated concepts. Such a stipulation might correspond to previous definitions and usage by lucky coincidence but nothing guarantees that the stipulation and associated examples are representative of the scope of meaning previously established. As such, stipulation cannot clarify a previously constructed concept. Rather, it can lead to greater terminological/conceptual complexity, language instability, and confusion. Fourth, care must be taken to ensure that found or constructed examples actually do correspond to the definition. This requires detailed analysis and modelling of both conceptual relations and the system of referents to which the terms/concepts of the example are meant to apply. In conclusion, despite advantages of establishing meaning and ensuring consistency in meaning, reasoning, and communication, stipulation is an inappropriate method to determine meanings previously assigned to 'relevance' and its relatives. Such is my reason for excluding it as an approach for my study.

Intuitive Appeals. Bunge (2003: 152) defines 'intuition' as insight; specifically, the "ability to understand or produce new ideas instantly and without prior rational elaboration." He

explains that an intuition is a pre-analytic, immediate understanding of something. It can be conceived as occupying one end of a continuum. At the other end is reason, which is characterized by exactness and formality. He emphasises that intuitions never come out of the blue. Rather, they culminate processes of learning and search. So, intuitability depends on both the subject matter and the knower. For example, what is intuitive to the master might be counterintuitive to the apprentice. If promising, intuitions can be exactified. He emphasises that history has shown that counter-intuitiveness in science is often a trademark of originality and depth. In contrast, intuitionism is a methodological/epistemic position. Bunge (2003: 152) defines it as irrationalism; specifically “the view according to which intuition is superior to both experience and reason.” Bunge does not deny the importance of intuition but he rejects intuitionism because of the overwhelming importance and success of methods employing experience and reason, as science does.

The point to be taken from the analysis of problem statements and understanding of intuition is that we need to get beyond our vague intuitions about relevance and develop an explicit account/understanding of it, which I suggest requires analysis/evaluation of both definitions/usage and their referents. In contrast, an account fails to provide either an explication of concepts or explanation of facts if it ends at a crucial moment with ‘it seems intuitively clear to me that such is the case’, provides an example of a relevance statement without analysing it, or defines ‘relevance’ only with a synonym. The last case is clear but the first two need further elaboration.

An appeal to intuition, as a final test, can be problematic. (For example, see Naess 1947.) Acceptance of a claim or position becomes a matter of correspondence to others’ intuitions, which we must survey and statistically evaluate. Surveying opinions involves considerable effort, expense, and difficult sampling issues. Given these concerns, we would have to develop a policy to decide which issues are worth surveying and, accordingly, which issues ought to be resolved or left forever in conflict. Nonetheless, if we do survey opinions and find that they conflict, we could face interminable conflict if left simply as intuitions. To resolve the issue perhaps we could vote on whether or not to accept or reject the example, but our intuitions even on that might conflict. Even if we agreed to vote, we would have to find a satisfactory way to do so. But again our intuitions could vary. Supposing that we could agree, a vote would get us beyond the impasse but it might not resolve dissatisfaction, particularly for those who lose. Nor would a vote resolve the initial conflicting intuitions. They remain despite agreeing to accept the vote for the sake of reaching an agreement. Alternatively, persons with ardent beliefs and/or inclined to exercise power could

appeal to force or act forcefully and require acceptance or rejection. But like the survey strategy, we make no rational advance and would have no direct understanding of the object to be explained or explicated. Nonetheless, if attempting to explain/explicate an object and we become stymied, intuition might be the best we can do at a particular time. But this should stimulate exploration of different approaches and further research to develop an adequate explanation/explication (See Bunge 1962 for other details.) In conclusion, I suggest that intuition should play a secondary role to problem assessment, data analysis, and the development of explicit accounts.

When illustrating a definition of 'relevance' or point about it, an example of a relevance statement can be provided without systematically analysing it. (For example, see Bunge 1974.) The example might be provided because it appeals to the author's intuitions or it is based on the author's greater body of knowledge. Without further information the reader cannot distinguish between the two. In the first case, intuition becomes a problematic final test. In the second case, no elucidation is provided and the account is incomplete. The reader has two choices. One is to appeal to his own intuition, but this becomes a problematic final test. The other is to provide the elucidation. In later sections, I take on this task of elucidating examples and often find surprising results because I find that the examples are problematic in some respect. Accordingly, the account based on a problematic example is also problematic.

3.2.3 The Need for a Conceptual System

The term and concept 'relevance' are already situated within a semantic context or become situated as such when a definition is stipulated, as we see when looking up the term in a dictionary. That context's clarity, detail, depth, and structure is an issue needing appraisal, as will be discussed in detail in Chapter 4. Further, to elucidate the notion of relevance, one can only do so by situating it within a web of other terms and concepts. In any case, a conceptual system is preferable to a mere aggregate of limited terms and concepts (Bunge 1973, 2001, 2004). For example, scientists examining a range of skin infections have been hampered by an unsystematic terminological and conceptual framework created by an unsystematic understanding of pathogenic yeast species. In particular, yeasts have not been correctly identified and classified, which has confounded the association of cause/organism with effect/symptom (Guarro 1999). Essentially, the problems involve both a mismatch between term/concept and fact and an imprecise representation of facts. As a result, determining relevant medical treatment has been problematic and unsuccessful

because the conceptualization leads to an assumption of non-pathogenicity and treatment of symptoms; e.g., treating rashes to alleviate discomfort through the application of oil or nitrogen based substances inadvertently feeds the yeast (Gueho 1987; Marcon and Powell 1992).

This case is analogous to the problem of relevance where terms also represent concepts and these represent either an existing set of terms/concepts or a system of factual objects, which suggests that the initial task in developing an account of relevance is to understand the semantic web within which it is situated. Doing so is akin to science where assessing intelligibility of an hypothesis comes prior to testing it (Bunge 2001; Borsodi 1967). Additionally, when relevance statements represent factual objects, we need to develop an understanding of respective factual systems, including their dynamics; ensure that we have a corresponding structured language that represents the systemic structure of factual referents; apply rules to combine terms/concepts, which promotes consistent reasoning; and apply tests to evaluate reasoning as expressed through language.

Choosing a conceptual system is important because its individual elements and the system as a whole create a frame that determines the relevance of information, explications of concepts, and explanations of facts. I have chosen Bunge's system because it spans semantics, ontology, epistemology, ethics, and technology; has been developed from a basis of current factual knowledge; is based on a principle of exactness; and has been applied to physics, psychology, biology, social sciences, and science in general. Further, Bunge (2004) has written extensively on systems theory and philosophic research. A systems approach is crucial to elucidating relevance because, as detailed in Sections 4.3 and 4.4, a relevance statement refers to various types of relations involving conceptual and/or factual objects. Modelling the referent systems to construct or evaluate a relevance statement and to develop a general theory of relevance depends on knowledge of those systems. In adopting Bunge's system I will assume that he has adequately defended its foundations. However, I will not assume, as he does not, that revisions, refinements, and re-articulations within the general 'spirit' of the system are not needed.

Other conceptual systems representing perspectives like idealism, nominalism, empiricism, or positivism might also be used to explicate relevance. Each would generate a different perception of the problem, approach to it, data sources, and account of relevance. That is, each position would create its own frame of relevance, which would determine the nature of the inquiry or argument and its results. Doing so would be of value because results could be compared, which would provide a

test of the respective positions. It would also be an alternate strategy to that of critiquing the foundations of respective positions. But such a project is beyond the scope of this thesis.

3.2.4 An Overview of Bunge's Account of Scientific Philosophy

As mentioned, the choice of Bunge's approach and conceptual system create a frame of relevance that distinguishes it from other approaches/conceptual systems and determines both the nature of my inquiry and its results. The following provides a broad overview of the essential elements of the approach and position that Bunge calls 'scientific philosophy'.

Underlying Bunge's philosophy is scientism. It is a view that scientific research is the best way to secure accurate and deep factual knowledge, not that it is the only source of knowledge. Neither is it a view that all scientific findings are true and final. Rather, scientific explanations are subject to further refinement or even replacement (Bunge 1998b:68.2) much as technological prototypes are. Consider, for example, the technological innovation that has occurred from the first telephone to the modern cell phone. Bunge (2003: 262) maintains that what scientism denies is the existence of inscrutable things other than those that have disappeared without leaving perceptive traces. Stated positively, science relies on real objects that can be investigated to supply evidence for hypotheses. This evidential relation involves a mutual referential link from data and hypothesis to the same referent. The link is not merely from a statement to another statement (2003: 93). In contrast, obscurantists assert both the existence of inscrutable entities (e.g., unreal imaginary objects) and incorrigible statements (e.g., dogmas). Given such a view, one might question whether discovering the physical laws necessary to invent the telephone or seeing the need to refine the first telephone would have been possible.

Bunge's view of scientism is in direct opposition to a sense that Blackburn (1996) articulates. Here 'scientism' is taken to be a pejorative term for...

“...the belief that the methods of natural science, or the categories and things recognized in natural science, form the only proper elements in any philosophical or other enquiry. The classic statement of scientism is the physicist E. Rutherford's saying 'there is physics and there is stamp-collecting'.”

First, the quotation is likely incorrect. *The Oxford Dictionary of Modern Quotations* (Knowles 2002) contains the following quotation by Rutherford “All science is either physics or stamp collecting.” Second, how either statement connects to Blackburn's characterization of scientism is not clear. Rutherford might be making a distinction between description/classification (e.g., stamp-

collecting) and explanation (e.g., theoretical physics) to emphasise that theory is an ultimate goal of science. However, if Blackburn's outline of scientism is meant to illustrate a view that physics is *the* quintessential science and that everything reduces to physics or is amenable to methods of physics, then the view of science is undeservedly limited, misrepresentative, and unnecessarily reductionist and is inconsistent with Bunge's position (1998, 2001, 2004).

For Bunge, science is the critical search for, or utilization of, patterns in ideas, nature, or society. He characterizes basic science as the disinterested search for new factual knowledge, whereas applied science is the search for new factual knowledge of possible utility in industry or government (Bunge 2003: 259, 290). Formal science refers only to representational constructs (e.g., concepts) and their combinations; e.g., logic and mathematics. Factual science refers to concrete things for which it requires empirical procedures such as measurement and conceptual procedures such as calculation (Bunge 2003: 259). Bunge suggests that factual science is relevant to all philosophic branches, except logic, because science concerns all that exists or may exist; i.e., anything conceptual, material, natural, or social (Bunge 2003: 261).

Concerning Bunge's scientific philosophy, its aims are to (i) be exact, clear, concise, and internally consistent; (ii) agree with the bulk of current science and technology to prevent (immediately) obsolete views on, for example, being, knowing, or doing; (iii) be helpful in identifying new and interesting philosophic problems; (iv) be instrumental in evaluating philosophic ideas; (v) be capable of participating competently, and sometimes constructively, in some of the scientific, moral, or political controversies of the day; and (vi) be helpful in identifying bunk (Bunge 2003: 29, 261). Similarly, to practice scientific philosophy is to construct hypotheses or theories that are precise, compatible with the bulk of relevant scientific knowledge, and entail empirically testable consequences when joined with subsidiary hypotheses and empirical data (Bunge 1973; 1999: 1f; 2003: 262). Confirmation and falsification are required as are empirical and conceptual tests for well-formedness, meaningfulness, truth, and fruitfulness. These produce either positive evidence, which provides an indication of truth, or negative evidence, which provides an indication of falsity. Testing presupposes testability. This is a property of a proposition or scientific theory. Specifically, testability is the ability to confirm or infirm a proposition or theory and, hence, assign a truth value. Testability is a function of conceptual precision (Bunge 2003: 291). Another important related concept is scrutability, which is the ability to examine an object. Specifically, it is a joint property of the object being scrutinized and the

knower's means of observation and analysis.

Bunge's extensive reviews of disciplines within the sciences, humanities, and technology lead him to maintain that a generic scientific method is applicable to all intellectual pursuits (Bunge 1998: 8). The method involves the following steps:

- a. Survey a relevant body of knowledge.
- b. Choose a problem within a body of knowledge.
- c. Formulate or reformulate the problem.
- d. Apply or invent an approach to handle the problem.
- e. Articulate a tentative solution (a hypothesis, theory, experimental design, etc).
- f. Check the tentative solution.
- g. Evaluate the tentative solution in light of both test and background knowledge.
- h. Revise or repeat any of the previous steps.
- i. Estimate the impact on background knowledge.
- j. Provide a final evaluation; i.e., until new notice.

Given this broad outline of a scientifically informed philosophic study, we can now move on to consider what information sources are relevant to the problem of relevance.

3.3 Information Sources

One potential source of information is the historical record of previous constructions that express the concept of relevance. By 'historical', I mean the time period prior to the semantic question being asked. Such constructions include relevance statements and definitions. As constructions, they are facts that can be inventoried, described, and classified. Hence, scientific principles apply to this aspect of the semantic question. A second source of information is constructive acts that occur after asking the semantic question or any related question about the meaning or use of relevance. Commonly, such constructions are used by a particular person to illustrate a definition of 'relevance' or a point about it. Analogously, an engineer can inquire about the design of historical structures as well as structures she builds from previous designs or a modification of them. Similarly, a biologist can study other children as well as his own. In all three cases, the new constructions become part of the population of previous instances. The appropriateness of using either source depends on the purpose of the inquiry. As mentioned, if the purpose is to discover the meaning of relevance, I suggest that historical records provide the only evidence to answer that question. However, if the purpose is to reform previous meaning or create new meaning, a stipulation can be constructed without having to articulate a representative generalization about previous usage. Examples that are constructed to illustrate the stipulation are

appropriate to it but not necessarily any previous usage.

In this section, I will outline the information sources that I consider appropriate to developing a general theory of relevance. I will examine the problem of using previously constructed examples to develop a representative generalization of previous usage. I will also examine examples that are constructed to illustrate a definition or make a point about relevance.

3.3.1 Previously Constructed Definitions and Relevance Statements

Ernest Vincent Wright alludes to a particular restriction in writing his book that other authors normally do not encounter:

'Now, any author, from history's dawn, always had that most important aid to writing—an ability to call upon any word in his dictionary in building up his story. That is, our strict laws as to word construction did not block his path. But in my story that mighty obstruction will constantly stand in my path; for many an important, common word I cannot adopt, owing to its orthography.' From *Gadsby*, 1939.

The passage cryptically mentions that his restriction involves letters. Although we are not told exactly what that restriction is, it can be discovered because the text is a sample of the book and the restriction applies to it. The question that the text generates is, 'What is the rule?' Analogously, we routinely express relevance judgments without explaining them and can discover what relevance is/means by analysing such data. The question that this text generates is, 'What does relevance mean?' But what data should be analysed to address this semantic question?

An obvious but incomplete answer is that we should analyse statements containing the terms 'relevance' and 'relevant'. However, in any such analysis, we need to recognize that the association between a term and its meaning is not a lawful relation as is the bonding between sodium and chloride in a supersaturated solution. Rather, the association between a term and its meaning is a convention that must be learned, but might be learned and applied incorrectly. Further, nothing restricts anyone from assigning a radically new meaning to a term either through usage or stipulation. In any event, a great variance in meaning associated with a term can result over time. A second problem is that of the number of statements required to establish an adequate sample. However, I am not aware of any studies that determine the size of an adequate sample. A third problem is the sample's representativeness, which is a function of different types of statements (e.g., topics or disciplines within which the terms are used), their relative size, and the size of the sample taken for each type. A stratified random sample would alleviate these concerns

but I am not aware of any studies that provide information on the population of relevance statements from which such a sampling strategy could be designed.

Even if these problems were to be solved, inventorying statements that include just 'relevance', 'relevant', and their negations would inadequately represent the concept of relevance because the concept is also expressed through the use of synonymous, other related terms, and expressions, which reflect explicit judgments. For example, as discussed in Sections 4.3, 4.4, and particularly 6.1, if 'relevance' is synonymous with 'relation', then any relational statement is a relevance statement and a theory of relevance must account for all types of relational statements. However, if the two terms are not synonymous, differences must be identified and instances of their respective use distinguished. Otherwise, a representative theory of relevance could not be developed. Similarly, the overlap in meaning between 'relevance' or 'relevant' and any other related term like 'connection' or 'apt' must be determined to identify instances of the basic concept designated by 'relevance'. Otherwise, a theory of relevance would be incomplete. The same applies to synonymous expressions that do not contain an obvious term related to relevance; such as, 'Your reaction has a lot to do with how I proceed', which can be also stated as 'Your reaction is highly relevant to my course of action.' Finally, the concept of relevance can be employed without making an explicit judgement. For example, in writing this paragraph, I make judgements concerning the relevance of one statement to another and the relevance of these to the subsection, section, chapter, and thesis as a whole. But I do not make them explicit.

The burden of collecting a representative sample of statements that includes the use of the concept of relevance is somewhat alleviated by work done in lexicography, where statements have been collected and used to develop definitions. Also, other researchers have attempted to define or otherwise elucidate relevance. In both cases, these definitions and elucidations become an integral part of the system of language users. Accordingly, the primary data base for the study will include (i) definitions from general or special dictionaries and the academic literature wherever definitions of 'relevance' are given; (ii) statements containing relevance expressions; and (iii) elucidations of either the concept of relevance or the nature of relevance judgments, including examples used to illustrate these. When necessary, I will construct simple, realistic statements and examine these within the light of a theoretical point. However, I will guard against using such examples to 'prove' a point, which would introduce a circularity or provide an insufficient confirmatory instance.

I will focus on usage of the term 'relevance' rather than 'irrelevance' because examples of

the latter concern what relevance is not, which takes into consideration a vastly greater domain than what relevance is. To enumerate each type of irrelevance ($x \text{ }^{Ir} \rightarrow y_n$) would take us down a long, winding, and never ending road (y_n). For example, the statement ‘My pencil is dull’(x) is irrelevant to any statement that has or will be made (y_n), except the one that represents what I have decided to do next as represented by my conclusion, ‘Therefore, I will sharpen it.’ To explain, I am the determiner of relevance because I am the one responsible for determining what the terms that I use mean. Here, I choose to conform to convention, as others would assume, since I have not defined terms myself. Beyond the linguistic level, it is *my* association between the state of my pencil and what I ought to do about it, given my particular situation and how I interpret it, that is the determiner of relevance. In this particular case, these determiners create a very narrow frame. What is outside this frame is vast and it does not reveal the nature of the relation I constructed. Certainly, having noticed the dull pencil, a number of relevant possibilities arise in terms of what I could do, what others could do, or what others say I could or should do but this identifies possible relevance relations as opposed to the one actual relevance relation established by the frames/determiners that I mentioned. The difference between the two stages, from an individual’s perspective, is one of deliberation and decision. From an interpersonal perspective, the difference is between my decision and others’ recommendation.

The literature contains many examples of irrelevance to illustrate relevance and Hjørland (2000) thinks that irrelevance is the key to deciphering the riddle of relevance in information science. In contrast, I side with Archimedes who tinkered with machines until they worked and then explained the principles upon which they did, in fact, work. Given that correct relevance judgments are as common as they are, we have no shortage of ‘working machines’. However, my limited review of the literature indicates that we have few explanations why they work, which indicates a problem in finding a way to explain them. Hence, my emphasis is on the *problem* of relevance and positive information sources. I do not ignore statements of irrelevance. However, I suggest that we need to understand them by way of positive examples. I illustrate how in numerous later sections.

3.3.2 Relevance Statements Constructed to Illustrate a Definition

At times, constructing an example that illustrates a definition can be useful, providing that correspondence actually occurs (Tables 21-25), circularity does not occur, limitations of the example are stated, and the example is not contrived or simplistic. Distinguishing between a useful

illustration and a contrived or simplistic example is not always easy. Further, anyone constructing an example can fall victim to the latter. To construct a good example or to evaluate an example, it must be thoroughly analysed. To illustrate what I mean, I will examine Stephen Carey's example and assessment of the *argumentum ad hominem*, a fallacy of relevance, which he alleges occurs in response to his recommendation to buy his book *Scientific Method*. Carey writes:

If...I argue that every student ought to know something about science and, so, ought to read this book, you might reply that I receive a royalty from the sale of copies of the book. If your point is to mount an objection to my argument, you are guilty of an ad hominem fallacy. Even though what you say is true, the point you make is not relevant to the argument I have given. By pointing out that I stand to profit if students buy [sic] this book, you attack my motives for arguing as I have, but you have not shown that my argument is flawed. (108.2)

Carey's initial argument is:

A-P₁: Every student ought to know something about science.
A-C : So, every student ought to read Carey's book.

The objection finds a hidden motive/implicit premise to Carey's argument.

O-P₁: Every student ought to know something about science.
O-P₂: Carey receives royalties from selling the book.
O-C : So, every student ought to read Carey's book.

Carey's response is:

R-P₁: O-P₂ is an attack on Carey's motives not his argument.
R-C : Therefore, O-P₂ is irrelevant to the argument.

Two interrelated problems occur in this example. One is that it is contrived. The other is that Carey assumes that any personal attack produces a fallacious argument. The example is contrived because it is constructed, does not represent a real case, and is misleading because it is incomplete. Concerning the latter, the example does not include reasons why the opponent suspects that Carey's motivation includes financial gain and, in his response, Carey merely denies that he is motivated by financial gain. So, we are provided only with an affirmation and a denial. To rectify the problem Carey must *specify* reasons to support the respective claims. He cannot *report* them because no real person is available to defend the claims.

The inadequacy of the example could be a result of three possible factors. First, Carey's denial might have resulted from a superficial or hasty response to the objection. Such a response is of no help in illustrating a fallacious argument. Second, he might have relied on an intuition that royalties received from book sales are generally not connected to recommendations to purchase a

book. However, the latter is false because we know that people have been motivated by personal gain to make such recommendations and Carey did not rule out that possibility when presenting his first argument. So, challenging the recommendation through counter-argument or questioning is certainly relevant. In turn, this shows that Carey's assumption that every personal attack results in a fallacious argument is false. Even if Carey had included a denial in his initial argument, the example would still be incomplete and the allegation of personal gain would still be relevant because we know that people have been dishonest when motivated by personal gain. However, we do not know anything about Carey that would engender or compromise our trust. Third, Carey might have objected to the counter-argument because financial gain was not part of his original argument. So, the counter-argument goes beyond the unit of thought expressed by the argument. However, the counter-argument is relevant to the argument because the counter-argument points to a substantive problem with the argument, which results from its inadequacy.

Detailing the implications of Carey's example and further questioning it can also show why it is contrived. Doing so also increases both the doubt about his denial of being motivated by personal gain and the relevance of questioning his motivation. In the initial argument, Carey recommends that *all* students should read *his* book rather than others' books. First, suppose that he receives one dollar for each book sold. UNESCO (2003) reports that currently over 100 million students are enrolled in universities across the world. Assuming that his book is translated to other languages, world enrolment rates remain the same for 10 years, and each student actually buys a book, Carey's recommendation would net him a profit of at least one billion dollars over ten years. Even if only one tenth of total students bought the book, Carey's profit would be 100 million dollars over 10 years. Second, numerous books are written on science. Why does Carey recommend just *his* book rather than *a* book on science? The fact is, other ways are available to become informed about science. Third, Carey does not compare various books to determine their relative merits and indicate why his is singled out. Similarly, a car dealer could say that, because we need a car, we ought to buy one of his. But he does not tell us why he recommends *that* particular car and we do not even know if it is a new car or a 'bucket of bolts' behind the shop.

In summary, I suggest that the example is contrived and fails to meet the intent of illustrating a fallacious argument. Even if it did, Carey does not provide an adequate explanation of the example so its use provides no understanding of irrelevance, let alone 'relevance' which requires positive examples to illustrate it.

4.0 Analysis and Evaluation of General Dictionary Definitions

Given the goal of discovering what ‘relevance’ means, the objectives of this section are to (i) provide a sufficient understanding of lexicography to permit an analysis/evaluation of dictionary definitions; (ii) defend why they ought to be analysed and evaluated; (iii) outline a sample of definitions, which are ‘wrapped’ by various expressions; (iv) analyse and evaluate definitions and examples to determine conformity of the example to a definition, evaluate appropriateness of the definition, and identify the elements and structure of definitions and statements; (v) analyse and compare definitions to reduce various expressions to their basic concept, determine the coverage of the concept of relevance, and determine its relations to other concepts; and (vi) identify issues that require more detailed examination. The main task is to outline the hierarchic structure of terms, which is a means to determine essentially what relevance is/is not and how it is situated within a larger conceptual system. Aside from providing the essential elements to build a preliminary theory of relevance, which will be synthesized in Chapter 7, this analysis provides a necessary context within which a theory of relevance can be built because it provides the semantic context within which we use language, propose definitions, justify such proposals, or otherwise elucidate notions.

4.1 Dictionaries: Problems/Opportunities for Developing a Theory of Relevance

General dictionaries, like the Oxford or Merriam-Webster dictionaries, do not always provide precise or systematic definitions. Consequently, these definitions can be rather troublesome or useless in science, law, and philosophy where precision, consistency, and systemicity are crucial to reason correctly, order knowledge, and/or specify clear prescriptions. For example, Stehbens (2001) comments on such problems in cardiovascular research.

...accurate and precise word usage is prerequisite to avoid unintentional misrepresentation in scientific communication. The increasing frequency of word misuse necessitates review of a number of definitions and frequently misused words in vascular pathology. Correction of such errors is essential to foster accurate, standardized definitions. Otherwise scientific progress is delayed, the unwary are misled and fallacious data and concepts are propagated. Adherence to correct word usage facilitates the development of logic and precision so essential in education and in scientific thinking and literature, whereas consistently misused words ultimately become meaningless and unusable.

Further, it is said not only that some dictionaries are descriptive in that they provide a record of usage but also that a mark of a good dictionary is that it is descriptive (*Encyclopaedia Britannica* 2004). Descriptivists argue that language use and word meaning are constantly changing and

lexicographers must continually inventory and report usage. Otherwise, dictionaries can and have become obsolete quite quickly (Landau 1984). However, what lexicographers do in creating a dictionary is not just describe or report meanings but *interpret* quotations/usage and *construct* definitions from their interpretations, which is evident from consulting dictionaries like OED where both definitions and usage are available. (Also, see Hanks 1990 and Landau 1984 for practice in defining terms.) Dictionaries, then, are descriptive in presenting meanings only insofar as they correctly correspond to actual usage. Unfortunately, where survey data are not reported by a dictionary, we can not determine whether a definition actually corresponds to usage. Additionally, citation readers are to be adept at selecting “good” examples and lexicographers select meanings that occur in sufficient numbers to warrant inclusion in a dictionary (See Landau 1984 for his rules of definition). Finally, we have a situation in ordinary language that is largely uncontrolled, despite schooling, whereas in the specialized languages of mathematics or science, correctness of use is a primary concern, as Stehbens emphasises. This is not to suggest that mathematical or scientific languages are static because they are not (e.g., ‘energy’, ‘gene’). But it is to say that, at any given time, definitions in science must accord with best/most current knowledge.

The descriptivist argument, as correct as it is, conceals some essential details about language and dictionaries. First, someone must, at some time, use or define a word and thereby give it meaning. That is, words and meanings are constructed through cognitive acts not generated as weather is from the circulation of air masses. Insofar as others adopt such meaning and lexicographers report on it, which standardizes meaning to a degree and for a while, the original prescription is maintained and perhaps even amplified. Second, if dictionaries were purely descriptive, they would not contain spelling or pronunciation guidelines. Third, given cases when we use dictionary definitions to facilitate communication or resolve linguistic conflicts and teachers/parents teach and students/children learn a language by appeal to dictionary definitions, a dictionary is anything but a pure description of usage. Once lexicographers construct a definition and we decide to employ that definition, then the dictionary becomes prescriptive.

Given that an initial definition/usage is prescriptive and we either adopt it directly or indirectly through a dictionary, we ought not to feel disinclined to analyse them and recommend better ones. Besides, what makes an historical use of a term and its related concept a particularly good use or conception? It might be useful to know historical conceptions to understand what was meant at that time and to get a clearer indication of what we mean today. However, why should we

be bound to historical conceptions based on knowledge of that day? Rather than becoming entrapped by this construction and interpretation process, what we need to understand is the dynamics of language and how to manage it for our particular purposes. That is, as our knowledge changes, so do our conceptions and so ought our definitions. Further, we need to understand how dictionaries represent conceptions and whether they do so adequately.

Lexicography, which concerns dictionary making, is taken to accord with rigorous scientific principles (*Encyclopaedia Britannica* 2004). However, dictionary definitions are constructed with an emphasis on sense of a term from the sense of other terms implied by usage, as will be shown in Sections 4.3 and 4.4. Without consideration of how referents are situated among other similar and dissimilar objects (factual or conceptual), we cannot develop a precise system of concepts. We can, however, learn how to use words sufficiently well to meet many ordinary needs. 'Relevance' is such a case. Additionally, insofar as dictionary definitions are constructed from large samples of quotations, as Oxford dictionaries are, one scientific condition is met; i.e., real data. However, as mentioned, collecting an adequate, representative sample is problematic. Also, quotations taken out of context might not provide sufficient information to identify a concept precisely as an author intended and lexicographers do not show the analyses upon which definitions are made. Finally, from the definition alone, we do not know how well the conception or its articulation represents its referent. Concerning the latter and given that dictionaries emphasise sense, we might be unnecessarily hindered when employing such conceptions to build representations of factual objects. As Diogenes Laertius [3rd C.] remarked:

...men ought not to investigate things from words, but words from things; for that things are not made for the sake of words, but words for the sake of things (from Borsodi 1967).

What he means by 'for the sake of things' is that, in such a case, words represent things and, being representational devices, we ought not to confuse the 'original' with the 'copy'. Similarly, Marcus Aurelius [121-180] emphasised the need to construct definitions or describe things presented to us and to do so in a way that allows determining distinctly what kind of thing it is "in its substance, in its nudity, in its complete entirety." Then, he instructs us

...tell thyself its proper name, and the names of the things of which it is compounded, and unto which it will be resolved. For nothing is so productive of elevation of mind as to be able to examine methodically and truly every object which is presented to thee in life, and always to look at things so as to see at the same time what kind of universe this is, and what kind of uses everything has with reference to the whole, and what with reference to man. (from Borsodi 1967)

The important points of note here are explicitness and precision of definitions and a systems approach to both factual inquiry and development of conceptual structures.

When we look up a definition in the dictionary and accept it, we assume that all has gone well and we can trust it. For many conversational purposes, doing so might meet our needs. However, dictionary definitions can be inadequate in special situations where precision and conceptual systems are important. Such is the case with 'relevance'. Further, our definitions need to change when corrections or refinements to our knowledge and understanding of referents occur or when better articulations allow better conceptual understanding and application. As such, the generation of concepts is outside the lexicographer's purview. The best a lexicographer can do is determine what concept is intended and he does that through interpretation of how symbols are used within the context of a quotation and, if available, definitions from the same time period.

When we accept a definition, we encounter it at the end of a very long process that involves (i) concept generation; (ii) the use of symbols in speech or writing to express that concept, which may or may not explicitly or specifically reveal the concept and how that concept is distinguished from others; (iii) the interpretation of those symbols by audiences and their subsequent usage; (iv) the collection of selected written quotations and/or definitions by lexicographers; (v) a decision by lexicographers on which quotations to use; (vi) their interpretation of the use of symbols in selected quotations and their identification of concept, when terms are not explicitly defined; (vii) their articulation of sense through terms of the day; and (viii) their (rough) comparison of a defined term to the sense of other terms. As a result, we find ourselves in a predicament at this late stage of the process. Such is significant, given that language is of such importance both cognitively and practically. Thomas Hobbes (1615) nicely illustrates this predicament relative to our needs.

Seeing then that *truth* consists in the right ordering of names in our affirmations, a man that seeks precise *truth*, had need to remember what every name he uses stands for; and to place it accordingly; or else he will find himself entangled in words, as a bird in lime-twigs; the more he struggles, the more belimed.

Being caught in a lime-twig, which is a snare that employs a sticky substance (*Merriam-Webster's Online Dictionary* 2004), is an apt illustration of what others indicate to be the state of our understanding of relevance. Hobbes continues:

By this it appears how necessary it is for any man that aspires to true knowledge, to examine the definitions of former authors; and either to correct them, where they are negligently set down; or to make them himself. For the errors of definitions multiply themselves, according as the reckoning proceeds; and lead men into absurdities, which at last they see, but cannot avoid, without reckoning anew from the beginning; in which lies the foundation of their errors. From whence it happens, that them which trust to books, do as they that cast up many little sums into a greater, without considering whether those little sums were rightly cast up or not; and at last finding the error visible and not mistrusting their first grounds, know not which way to clear themselves; but spend time in fluttering over their books; as birds that entering by the chimney, and finding themselves inclosed in a chamber, flutter at the false light of a glass window, for want of wit to consider which way they came in.

To sum up and conclude Hobbes writes:

Nature itself cannot err: and as men abound in copiousness of language; so they become more wise, or more mad than ordinary.

Diogenes Laertius, Marcus Aurelius, and Thomas Hobbes offer a clear statement of problem and a general approach to solve that problem. That is, to avoid confusion, we need to have *and* use clear, systematic, factually based definitions that are constructed by considering the facts themselves as they are systematically situated and by articulating in detail the components of each definition. As defined in Chapter 1, facts include both concrete things and the systems of which they are a part as well as facts of definition and word use through which concepts are identified, described, and used. Upon using words and we find ourselves in a predicament, we need to step back through the process of concept generation, definition, and use. We need to do so to seek greater clarification or correct mistakes. It might also turn out that we do not have enough terms for our concepts, enough concepts to understand the world, or we insufficiently understand the world. It might also turn out that we have too many terms and concepts. In such a case, we encounter a sea of terminological and conceptual confusion.

General dictionary definitions form a semantic background that we employ or to which we appeal, given the extent of our schooling and use of dictionaries. Hence, dictionary definitions can be an important starting point, even if it is just to identify their deficiency or get a general sense of a concept. Further, general dictionaries allow us to trace conceptual relations (as messy as they might be) because all terms used in a definition are defined elsewhere in the dictionary. Hence, a standard dictionary has the advantage over single definitions that occur in specialized contexts, like the academic or professional literature. In the latter two cases, terms that compose the definition are not often defined. This creates an interpretation problem because the reader cannot determine

the dictionary that an author is using. Also, an author might follow a dictionary more or less closely, if at all. A substantive problem arises because different dictionaries might offer definitions that vary subtly (intentionally/extensionally) and subtle differences can at times have a huge logical difference. For example, *Merriam-Webster's Online Dictionary* (2004) defines 'relevance' in a way that restricts it to a current consideration, whereas other dictionaries define it without the temporal limitation. As a result, the definitions differ greatly in their extension. Finally, despite advantages of general dictionaries, their definitions are not better than those that occur within a comprehensive conceptual system. Because dictionary definitions can be non-systematic, as we shall see with 'relevance' definitions, they can create a complex semantic structure and be unrevealing and burdensome. Accordingly, developing an account of relevance must consider what is meant by 'relevance', which is a function of its use and/or definition; how it is distinguished from other concepts; and how it is situated within a hierarchic conceptual structure. Dictionaries provide the best data to begin an analysis to address these questions. I collected definitions from all paper and online dictionaries but have reported definitions for only the major ones.

4.2 History of the Concept of Relevance

Given that a word originates as a cognitive construction, we can ask why it was conceived. That is, what purpose did it serve given the context of a problem to solve and referents to distinguish? Were existing terms/concepts insufficient in this regard or did the term duplicate the meaning and function of other terms already in use? To answer these questions we must distinguish between term and concept, and not think the job is done merely by tracing the origin of a term. However, such historical research on conceptual use is an enormous task and I do not have sufficient time to undertake it. Nonetheless, collecting readily available information can shed a bit of light on relevance and inform a theory of it. Given these considerations, my objectives are to trace 'relevance' terms back to their origins as used by the Scots and English and, from these definitions and quotations, identify the kind of relations and relata involved. I will also examine related words, analyse relevance into its component parts, and trace these back to their French and/or Latin roots. I will also examine Greek terms that share meaning with 'relevance' terms, which can shed light on the concept of relevance and assist others to analyse Greek philosophy to determine if it contains theories of relevance. Finally, I will determine the historical consistency of the senses of 'relevance' terms; i.e., whether or not the term-concept associations have changed.

The following analysis and evaluation of definitions and statements are aimed principally at determining the basic concept(s) of relevance; i.e., its essential conditions as revealed through various expressions. It will also yield other elements that I will re-assemble in Chapter 7, where I provide a preliminary theory of relevance, and permit the discovery of more obstacles to the development of such a theory. In developing the theory from this historical survey, a number of considerations apply. First, historical lexical surveys are based on usage. A usage that is incorrect (inconsistent with either definitions of the day or prior usage) at one time can become standard at a later time. Similarly, an incorrect definition can also become a standard use. Given such flexibility, our current or future use is not necessarily constrained by historical usage. Second, even though concepts associated with terms can change arbitrarily, exact definitions and consistent use are crucial in specialized contexts and this need is a prime motivation for the development of a general theory. Third, if definitional changes are to be made, they ought to be made in a spirit of recommendation rather than dictation because the latter, if uncontrolled, might create unnecessary complexity. Further, recommending a new definition ought to be based on good reasons. An analysis of historical and contemporary definitions and usage can provide part of that rationale; for example, if variable expressions frustrate the understanding of the basic concept that a term represents or terms are defined largely by synonyms, which takes us in circles.

4.2.1 Greek Origins

In tracing 'relevance' terms back to Greek origins, I relied on others' translations. In the case of 'relevance', any number of synonyms of the same or different degree of generality could be used and the translation hinges on the translator's understanding of the nuances between the different English terms, which are not particularly clear, and the nuances of Greek expression. Also, relevance determinations can be made and expressed without naming them. In this case, the text must be read, preferably in the original dialect, and instances identified, but this presupposes diagnostic criteria developed from a systematic conceptual system. Finally, the naming of a relevance determination is significant beyond its occurrence and expression because it signals an awareness of mental and language function. With this in mind, a few translations will be reported from dictionaries and ancient works.

Dictionaries of English-Ancient Greek contain a few entries that translate Greek words or phrases to the English 'relevant'. For example, Liddell and Scott (1889) translate the transliteration

enestin humas eidenai to ‘it is relevant, pertinent’ and *eis to pragma einai* to ‘to be pertinent’ or ‘to the purpose’. When searching for the key word ‘relevant’ the entry *eneimi*, which means ‘be, lie in’ is retrieved from Slater (1969). Table 1 provides a breakdown of related word forms. Senses of connection, belonging, and appropriateness are evident. The connection to ‘abode’ is also interesting as it connects to *oikos*, which will be discussed shortly. Further, the word *huparchô*, which generally means ‘to begin, make a beginning’ is identified as being similar in meaning to *eneimi*. Table 2 presents definitions of the related impersonal form *huparchei*, and one sense which generally means ‘to be the beginning’. As A1 shows, the word is used to connect a case with an object that supports it and, as B shows, the relational term ‘belong’ is central to the use of the word. So, an object that connects to a case or belongs to something is a relevant object. Finally, Woodhouse (1910) translates *oikeios* and *prosêkô* to ‘relevant’ (Table 3). *Oikeios* generally refers to house, which is the place where one belongs and is associated with other family members and related possessions. The sense of ‘belonging’ and its application to other objects appears to arise from this root meaning. *Prosêkô*, which generally means ‘to have come, be at hand, be present’, has also taken on senses of belonging, appropriateness, and relatedness and is also used in negative phrases to denote irrelevance.

A host of Greek words are similar to the English word ‘irrelevant’. Table 4 shows these as well as words and phrases that have similar meanings. The notions of being strange, foreign, or alien runs throughout the definitions and is applied to both factual and conceptual objects. In particular, *allotrios* is opposed to *oikeios* and is in a sense synonymous with *anoikeios*.

The definitions of terms related to ‘relevance’ and ‘irrelevance’ suggest that relevance is a fitting relation, or a matter of appropriateness. What makes a relation fitting is not answered by definitions alone but must be found in, for example, an author’s theory of logic, ethics, or rhetoric. The word ‘relevance’ may or may not be used in such works but when one understands the basic concept of relevance, the relevance relations can be identified. So, rather than suggesting that no theory of relevance has been developed (Woods 1994; Gabbay and Woods 2003), I suggest that many different types of relevance theories have been developed. However, they are not labelled as theories of relevance.

Table 1. Breakdown of the Greek Phrase ‘*enestin humas eidenai*’.

1	<i>Eniēmi/enesan</i>	to send in or into
	<i>Enezomai/enesan</i>	to have one's abode in
	<i>Eneimi</i>	to be in; (i) to be in a place; to be among; to be there, be in abundance; (ii) to be possible (iii) it is in one's power, one may or can
2	<i>Humos/humas</i>	your
3	<i>Eidenai</i>	idea
	<i>Aia</i>	epic form used for <i>gaia</i> - a land, country earth, land
	<i>Eidon/eiden</i>	to see, perceive, behold
	<i>Oida/eidenai</i>	to know

Source: Liddell and Scott (1889)

Table 2. Meanings and Phrases Related to *Huparchō*.

<i>Huparchō</i>		to begin, make a beginning.
<i>Huparchei</i>	A	1. the fact is that. <i>hōs huarchei tou echein</i> : as the case stands with regard to having.
		2. it is allowed, it is possible. <i>huparchon humin polemein</i> : since it is allowed you to.
	B	1. belong to, fall to one, accrue. <i>hē huparchousa physis</i> : your proper nature, its normal condition. <i>tēi technēi huparchein didous</i> : assigning as a property of art.
		2. of persons. <i>en panti . . pas chōriōi, kai hōi mē huparchomen</i> : every one in every place, even outside our sphere of influence (lit. to which we do not belong).
3. in the Logic of Aristotle - <i>huparchein</i> denotes the subsistence of qualities in a subject. <i>huparxei ti [tōi prōtōi]</i> : it will have predicates.		

Source: Liddell and Scott (1889)

Table 3. Definitions of *Oikeios* and *Prosêkō* related to ‘Relevant’.

Senses Concerning ‘Relevant’	
<i>Oikeios</i>	<ul style="list-style-type: none"> • in or of the house, domestic • of persons: of the same household, family, or kin, related • of things: belonging to one's house or family, one's own • proper to a thing, fitting, suitable; belonging to, conformable to the nature of a thing
<i>Prosêkō</i>	• to have come, be at hand, be present
	• metaphorical: belong to; of persons, belong to, be related to; impersonal, it belongs to, concerns
	• belonging to one; befitting, proper, meet; of persons, akin/relations
	Senses Concerning ‘Irrelevant’
	<p><i>ou prosêkon</i>: though or since it is not fitting</p> <p><i>ouden prosêkōn</i>: one who has nothing to do with the matter</p> <p><i>ouden prosêkon eniois</i>: though there is no connexion in some cases</p> <p><i>ouden prosêkont' en goois parastatein</i>: having no concern with assisting one in sorrows</p>

Source: Liddell and Scott (1889)

Table 4. Greek Words and Phrases Similar to the English Word 'Irrelevant'.

Similar Terms	Allotriologēō	irrelevantly; to speak of things foreign to the matter	
	Allotrios	1. of or belonging to another	
		<i>a. ommasin heirpon</i>	by the help of 'another's' eyes
		<i>allotriōn charisasthai</i>	be bountiful 'of what is another's'
		<i>gnathmoisi geloion allotrioisin</i>	with faces 'unlike their own', of a 'forced, unnatural' laugh
		<i>allotriōn charisasthai</i>	be bountiful 'of what is another's',
		<i>a. aman theros</i>	'where one has not sown'
		<i>allotriōtatois tois somasin chrēsthai</i>	deal with one's body 'as if it belonged to another'
		<i>tallotria</i>	'what belongs to others, not one's own'
		2. opposed to <i>oikeios</i> , foreign, strange (i) a. of persons - a. phōs stranger; b. hostile, unfavourably disposed; c. disinclined (ii) a. of things - alien, strange; b. medical - abnormal; c. foreign to the purpose	
		3. to be unfavourable disposed towards (i) strangely, marvellously (ii) in a manner foreign to	
	Huperorios	1. over the boundaries, abroad 2. foreign to the purpose, outlandish, alien 3. <i>tou nomou</i> 'beyond the boundaries of' the nome	
	Anoikeios	1. not of the family 2. unfitting, unseasonable; foreign to, incongruous w/; dissimilar to; alien from. 3. Astrology - not in its domicile	
		Adiēthētos	not filtered or strained; <i>ptisanē a.</i> gruel with the meal in it
		Allophulos	of another tribe, foreign, alien
Metoikos		settler from abroad, alien resident in a foreign city, denizen	
Allotriōō	1. estrange from (i) make hostile to (ii) to be unnatural, have a strange taste (iii) to be alienated from one's natural condition (iv) to be alienated, fall into other		
Similar Terms	Asullogistos	not reasoning justly; non-syllogistic, formally or materially invalid; irrelevant; unattainable by reasoning, incalculable	
	Adox-opoiētos	not forming notions, unreasoning	
	Asun-eleustos	non-coagulating; Gramm., not forming a compound	
	Asustrophos	not forming a solid mass	
	Anetoimos	out of reach, unattainable	
Diartēsīs	incoherence, irrelevance, <i>kata diartēsīn logos</i> : a non-sequitur		
Exagōnios	beside the mark, irrelevant		
Epiklētos	alien, foreign, irrelevant		

Source: Liddell and Scott (1889)

4.2.2 Latin Origins

The Pocket Oxford Latin Dictionary (English-Latin) and *The Pocket Oxford Latin Dictionary* (Latin-English) provide useful starting points for a more extensive survey because they provide a set of initial Latin and English synonyms (Morwood 1994; online edition 2003). A search for 'relevance' and 'relevant' in the Latin to English Dictionary cross references to *pertineo*, which contains the term 'relevant' in its definition (Table 5). A search for 'relevance' in the English to Latin Dictionary provides only a reference to the English word 'relevant'. Searches for 'relevant' yield the synonyms *aptus* and *appositus* and searches for 'irrelevant' yields the Latin synonyms *non pertinens* and *alienus* (Table 5). The definitions do not indicate any relata but, rather, list relational terms that vary in degree of generality/specificity. In order of generality the relational terms are: (i) connected to, continue or extend through or to, reach, dependent upon; (ii) attached to, adjacent, near; and (iii) suitable, adapted, appropriate, fit, and belong or pertain to. Where the term 'relevant to' fits within this continuum of generality/ specificity and to what relata it applies are issues that cannot be determined from these definitions. An inquiry into the Latin usage of these terms is required. Similarly, a search in *Words* (Whitaker 2001), a Latin word search engine, yields only a result for 'relevant' but the Latin entries listed are the verbs 'relevo', 'relevare', 'relevavi', 'relevatus', which all mean to relieve, alleviate, or diminish.

The Oxford Dictionary of Latin (Glare 2003) contains more detailed information on both Latin origins of synonyms of the English term 'relevant' and the Latin root word *levis*. *Apposite* is a relational term that generally concerns suitability (Table 6). It is derived directly from *appositus*, which concerns proximity in location, accessibility, suitability, inclination, and arguments drawn from or based upon comparisons. In turn, *appositus* is derived from the verb *appono* which concerns the acts of arranging things, fitting them together, applying one thing to another, combining things, reckoning, and attributing. So, acts of combining objects, as in cognitive acts that combine and compare objects to arrive at a conclusion, are judged to be suitably accomplished when *apposite* is applied to them. *Aptus* is a relational term that includes various senses of the strength of connection between two objects when fit together (Table 7). Senses of convenience, order, efficiency, and suitability run through it. *Levis* is also a relational term that specifically concerns various senses or applications of the concept of lightness (Table 8). Specifically, the relation is a comparative one; so, it requires a cognitive act. The senses of lightness concern

Table 5. Latin Synonyms of Relevant and Irrelevant.

<i>Aptus</i>	attached to; connected, suitable, adapted; (w/ ex, w/ abl) dependent (upon).
<i>Appositus apposite, appositum</i>	adjacent, near; fit, appropriate.
<i>Non-Pertineo, -pertinere, -pertinui</i>	continue or extend through or to, reach; belong or pertain to, be relevant to.
<i>Alienus alinus, alina, alinum</i>	another's, foreign; contrary, averse, hostile; unfavourable, insane; debt. [unconnected]

Source: Morwood 1994a,b; Whitaker 2001 - in square brackets.

Table 6. Definitions of Latin Terms Related to *Apposite*.

<i>Appono</i> , v, tr	<p>1 To place near or opposite (to), set along- side. b (esp. a table or vessel containing food or drink; cf. sense 2c <i>notam ~ere</i> to append a mark (to), set a mark (against), d to set by for comparison, set over against; (in quot. transf.); also, to use in comparison.</p> <p>4 To put or fit on, attach; to apply (medicaments, etc.).</p> <p>5 To bring to bear (upon), apply (to), b to subject, expose (to).</p> <p>6a To contribute as an additional element, add (to). b add in speech or writing, append (to); to add as a condition or stipulation, c To bestow, confer (on); <i>modum ~ere</i>, to set a limit (to).</p> <p>7 To assign, appoint (a person, esp. to some one else in a specific capacity, e.g. as a guard).</p> <p>8 To set down in accounting, reckon, attribute (to).</p>
<i>Appositio</i> [APPONO +-TIO]	The action of comparing, a comparison.
<i>Appositus</i> ¹ [pple. of APPONO]	<p>1 a Situated near or opposite (to), juxta- posed, adjacent, b ready to hand, accessible. c near in quality, kind, etc., akin (to).</p> <p>2 Suitable, apt.</p> <p>3 (of persons) Having regard (for), inclined (towards).</p> <p>4 (of an argument) Drawn from, or based upon, comparisons.</p>
<i>Apposite</i> [APPOSITVS ¹ +E]	In a manner suited (to); (absol.) suitably, appositely.

Source Oxford Latin Dictionary (Glare 2003).

Table 7. Definitions of Latin Terms Related to *Aptus*.

<i>Aptus</i> [pple. of APIO or APISCOR]	<p>1 a Tied, fastened, bound, b made up by uniting, composed, fitted together.</p> <p>2 (usu. transf.) Associated, connected.</p> <p>3 (w. ex, abl., or adv.) Dependent (upon), following (from).</p> <p>4 (w. abl.) Fitted or provided (with).</p> <p>5 a Prepared or equipped, ready, b ready for use, handy, convenient, c (of persons) adapted or adaptable.</p> <p>6 a In good order or condition, neat, orderly. b (esp. of style) neat, apt.</p> <p>7 (of persons or active agents) Efficient or good (at doing something), fitted (for), able (to).</p> <p>8 a Suitable for use, useful, convenient, favourable.</p> <p>9 Appropriate, fitting, in keeping, apt.</p>
<i>Apte</i> , adv. [APTVS+-E]	<p>1 So as to fit exactly, closely, tightly, snugly.</p> <p>2 Neatly, aptly, appositely.</p> <p>3 Suitably, usefully, properly.</p>
<i>Apto</i> [as APTVS+-TO]	<p>1 a To put in position, fit on, fix. b to put or fasten (armour, ornaments, etc.) on oneself, don.</p> <p>2 a To bring into position for use, bring, to bear, apply, b (w. non-material objs.) to bring into use, employ; dat. ad) to apply, refer, fit (to).</p> <p>3 To fit together, join; (transf.) to join. add.</p> <p>4 a To make ready, prepare, b (w. abl.) to equip (with).</p> <p>5 a To form or modify so as to suit, adapt, accommodate, fit. b to adapt mentally, bring into a suitable frame of mind, attune.</p>

Source Oxford Latin Dictionary (Glare 2003).

Table 8. Definitions of Latin Terms Related to *Levitas*.

<p><i>Levis</i>¹</p>	<p>1 a Light in weight, b (of vehicles or vessels) light in construction, (esp. as adapted for swift movement), c (as adapted for movement through the air), d <i>sit tibi terra -is</i> (and sim. phrs.), may the earth rest lightly on you (as a wish for the dead).</p> <p>2 a Not ponderous in movement, nimble fleet. b (of movements).</p> <p>3 a Not weighed down, unburdened, (in com- par.) lightened, b (fig.)</p> <p>5 (of actions, movements, etc) Lacking weight or force, gentle, slight, light; (also, of the hand, etc.)</p> <p>6 a (of physical conditions) Lacking intensity, moderate, mild, slight, b (of sleep) not oppressive, gentle.</p> <p>7 Unsubstantial, thin.</p> <p>10 a (of pain, loss, mischance, etc.) Easy to bear, tolerable, slight; <i>in ~i habere</i>. to make light of. b (of prices, expenses, etc)</p> <p>11 a Having little force or validity, weak, slight, ineffectual, b lacking severity, mild. c (of rumours, etc.) not firmly grounded, idle.</p> <p>12 Lacking authority or influence, powerless.</p> <p>13 a Of little consequence, unimportant insignificant, trivial, trifling, b (of crimes) venial. (forgivable: easily forgiven or excused)</p> <p>14 Intended for amusement, not serious, light.</p> <p>15 a (of persons) Unreliable, irresponsible, shallow, inconstant, fickle, b (of actions, emotions, etc.).</p>
<p><i>Levitas</i>¹ [levis¹-tas]</p>	<p>1 a Lack of weight, lightness, b desire for movement, restlessness.</p> <p>2 Lack of intensity (of pain), mildness.</p> <p>3 a Unreliability, inconstancy, fickleness, shallowness. b an instance of this, a folly.</p> <p>4 Without offence or suffering, easily, <i>~iter ferre</i>, to take mildly, tolerate.</p> <p>5 Inoffensively, mildly; <i>ut ~issime dicam</i> (and sim.), to say the least, to put it mildly.</p> <p>6 In a fickle manner, inconstantly, thought- lessly, lightly.</p> <p>7 Without good reason or authority, groundlessly.</p>
<p><i>Leuo</i>¹, tr. ~are ~aui ~atam [levis¹+o³]</p> <p>FORMS: leuasso {= ~auro}</p>	<p>1 a To lift or raise up. b to hold up, support. c to make higher, raise, d to set up, erect.</p> <p>2 a To lift off, remove (a load or burden). b to take off, undo (bonds, fastenings).</p> <p>3 (w. abl.) To relieve, rid (of burdens or encumbrances); (w/out abl.) to relieve of burdens, lighten, disencumber.</p> <p>4 a To reduce in force, potency, etc., lessen. b to lighten the effect of (an adverse circumstance). c to reduce, bring down (costs, prices. etc.). d to represent as insignificant, make light of, belittle.</p> <p>5 a To make more tolerable, relieve, lessen (pain, toil, loss, grief, etc.). b (med.) to relieve (disease or injury).</p> <p>6 (w. abl.) To free from, rid or relieve of (toil, worry, expense, etc.); (also w. gen.).</p> <p>7 To refresh, restore, make well.</p> <p>8 To alleviate the condition, circumstances, etc., of, relieve.</p>

Source Oxford Latin Dictionary (Glare 2003).

Table 9. Rank of Current Terms in English Usage based on Frequency of Use.

Relative Rank	Adjectives		Nouns	
	Adjective	Frequency	Noun	Frequency
1	Relevant	1,216	Relevance	5,051
2	Apt	10,440	Pertinence	74,468
3	Pertinent	17,948	Aptness	97,576
4	Apposite	37,112	Appositeness	202,518

Source: Websters Online Dictionary Rosetta Edition

physical weight, movement, acts committed in relation to others, punishment, burdens, pain, misfortune, cost, force, validity, groundlessness, authority, power, seriousness, reliability, and responsibility. *Levo* concerns acts of lifting, raising, or holding up; removing; alleviating burdens; reducing potency; and diminishing significance. Unlike the first three terms, terms related to *levis* appear at first glance to be the least likely of all terms to capture what we currently mean by ‘relevance’. Yet *levo* is the root word for it. So, it seems odd for it to have the prevalence that it does relative to the other terms (Table 9). *Pertineo* is a relational term that has a factual sense concerning the extension of physical features or related processes (Table 10). It also has a pragmatic sense concerning objectives and the directing of actions and words, interests of a person, ownership of possessions, and application of the law. Linguistically, *pertineo* is used to refer to conceptual or factual objects/events. As with the Greek, various relational terms applied to conceptual objects are ultimately connected to word senses referring to factual situations. For example, *pertineo* refers to physical extensions or connections and *oikeios* refers to the home. Such associations might be interesting to explore further. In both cases, refinement of conceptual distinctions requires further analysis of statements in context.

Also of importance is the root word *relevo* and its various forms (*~are, ~aui, ~atum*) that are constructed from the elements *re* and *levo*, all of which are spelled with a ‘u’ rather than a ‘v’ in the *Oxford Latin Dictionary* (Glare 2003). Its definition is as follows:

- 1a. To reduce the load of, relieve a burden. b. to make (a load) less heavy, lighten.
- 2a. To relive (a person, etc) of physical pain or discomfort, ease, refresh, etc. b. to relieve of anxiety or sim. c. to relive of a liability or expense. d. to free of guilt, exonerate.
3. To make (physical discomfort, etc) more tolerable, lighten, alleviate; (also hardships, misfortunes, or sim.) b. to reduce (expenditure) to lessen in force, intensity, or sim.
4. To raise from a fallen position, to lift (one’s eyes).

The first three senses apply to concerns of sentient beings, particularly humans but the fourth sense applies to a much broader realm of objects. The senses most significant are those of relieving liability or expense, freeing of guilt, and exonerating. These are the senses picked up by the Scots in the 1500’s and applied in the courts thereafter, as discussed in Section 4.2.4 . It is through this path that we come by our current terms ‘relevant’ and ‘relevance’.

Table 10. Definitions of the Latin Term *Pertineo*.

<p><i>Pertineo</i>, intr. ~ere ~ui, [per-+teneo]</p>	<p>1a (of physical features, etc.) To extend (to a point expressed or implied), reach, stretch. b (w. per) to extend over the whole (of an area), be diffused (throughout), c (esp. of an influence, condition, etc.) to extend (to) in its operation, progress, or sim.; (also transf. or fig.).</p> <p>2a (of actions, words, etc.) To be aimed (at) directed (towards some object), b to tend (to some result, usu. desired), be conducive (to).</p> <p>3a (of words or speech) To point (to a conclusion), refer (to an individual, etc.). b (of events, omens, etc.).</p> <p>4a To relate or pertain (to), have to do (with). b quod (quantum) <i>ad</i> — <i>et</i>, as far as — is concerned, c <i>ad</i> (in) <i>rem</i> ~ere, to be relevant or to the point; also ~ere alone.</p> <p>5 To be a concern (to a person, his mind, etc.), be the business (of).</p> <p>6a (of possessions) To belong by right (to), be the property (of); (also trans., of a quality, etc) b. (of persons) to belong (to a group), be associated (with), c (of actions, etc.) to be attributable (to), be the work (of).</p> <p>7 To come within the scope (of a law category, etc.).</p>
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Source Oxford Latin Dictionary (Glare 2003).

4.2.3 Latin Origins and Meanings of Elements of 'Relevance' Terms

'Relevance' terms can be analysed into three elements: the prefix 're', the root word 'lev' and various suffixes, all of which are derivatives of Latin. Further, there are the Latin words that combine 're' and 'lev'. As Tables 11 and 12 show, the coverage of these Latin terms is quite broad. Given Whitaker's definitions (2001; Table 11), the noun forms using *entem* refer to the state of an object being raised up, comforted, released, lightened, lessened, smoothed, or depilated. However, given Hoad's definitions (1996; Table 12), the noun forms using *entem* refer to the state of an object that has returned to a state of being raised, comforted, released, lightened, lessened, smoothed, or dipilated; hence, the notions of relief, alleviation, diminishment that derive from *relevo* and forms of *relevare*. Hoad (1996) reports that Latin words containing the prefix *re-* began to occur in English during the 1200's and became more frequent in the 1400s. However, 're' became an English prefix only in the 1600s when formations on native words were modelled to some extent on foreign compositions, as 'recall' is on the Latin *revocare*. The ambiguity of *re-* is shown in forms like *re-cover* (cover again) and 'recover'.

OED (1989) reports that the suffixes *-ance*, *-ancy*, *-ence*, *-ant*, and *-ent* used in English have been taken either from French, which was taken from Latin, or occasionally directly from Latin (Table 13). Historically, English speakers have either adopted the whole French word (e.g., 'relever'), which are based on an adaptation of Latin suffixes (e.g. *antia*), or they attached the French suffixes *-ance* or *-ence* to English words, particularly participles. These suffixes in English are just spelling variations, which reflect historical changes in convention. However, they have the same sense. When attached to participles, they form partly nouns of action, as in Old French, and partly nouns of state, quality, or condition, as in Latin. The latter idea is more distinctly expressed

Table 11. Latin Elements of ‘Relevance’ Terms.

<i>re</i>	thing; event, business; fact; cause; property
<i>levo, levare, levavi, levatus, levans</i>	lift or raise up; comfort; release, free from; lighten, lessen, relieve; make smooth, polish; free from hair, depilate
<i>relevo, relevare, relevavi, relevatus, relevant</i>	relieve, alleviate, diminish
<i>entem</i>	to be, exist

Source: Whitaker 2001

Table 12. Definitions of the Prefix ‘re’.

1. re	<p>(1.) backwards from a point reached or to the starting-point, e.g. <i>recedere</i> RECEDE, <i>revocare</i> REVOKE; passing sometimes into ‘away’, e.g. <i>removere</i> REMOVE.</p> <p>(2.) back to an earlier state or over to another condition, e.g. <i>renovare</i> RENOVATE, <i>resumere</i> RESUME.</p> <p>(3.) back in a place, from going forward, e.g. <i>residare</i> RESIDE, <i>retinere</i> RETAIN.</p> <p>(4.) again, in return, (the most frequent use in new).</p> <p>(5.) in a contrary direction, so that what has been done is annulled or destroyed (= UN-2), e.g. <i>renuntare</i> RENOUNCE, <i>revelare</i> unveil, REVEAL¹.</p> <p>(6.) in opposition or conflict, e.g. <i>rebellis</i> REBEL, <i>recriminari</i> RECRIMINATE.</p> <p>(7.) in response to a stimulus, with intensive force, e.g. <i>requirere</i> REQUIRE, <i>resolvere</i> RESOLVE.</p>
2. re	(from <i>res</i> : thing, affair) in the matter of, concerning

Source: Hoad (1996)

Table 13. Etymology and Current Definitions of ‘Relev’ Suffixes.

Element	Function	Etymology	Current Meaning
-ance	noun suffix	Mid English, from Old French, from L <i>-antia</i> , from <i>-ant-</i> , <i>-ans -ant + -ia -y</i>	1 : action or process <furtherance> : instance of an action or process <performance> 2 : quality or state : instance of a quality or state <protuberance> 3 : amount or degree <conductance>
-ancy	noun suffix	Latin <i>-antia</i> -- see: <i>-ance</i>	1 : quality or state <piquancy>
-ant	noun suffix	Middle English, from Old French, from <i>-ant</i> , prp. suffix, from Latin <i>-ant-</i> , <i>-ans</i> , prp. suffix of first conjugation, from <i>-a-</i> (stem vowel of first conjugation) + <i>-nt-</i> , <i>-ns</i> , prp. suffix; akin to Old English <i>-nde</i> , present participle suffix, Greek <i>-nt-</i> , <i>-n</i> , particle suffix	1 a : one that performs (a specified action) : personal or impersonal agent <claimant> <coolant> b: thing that promotes (a specified action or process) <expectorant> 2 : one connected with <annuitant> 3 : thing acted upon (in a specified manner) <inhalant>
-ant	adjective suffix		1 : performing (a specified action) or being (in a specified condition) <somnambulant> 2 : promoting (a specified action or process) <expectorant>

Source: OED 1989

by the variant *-ancy*, which has been formed in English as a direct adaptation of a Latin suffix. The suffixes *-ent* and *-ant* are attached to participles to form mostly adjectives and some nouns. Both forms are adaptations of the Latin word *entem*, which means ‘to be’ or ‘exist’. Understanding the role of these suffixes is important to assess claims that relevance is a property of a first relatum like a premise, as discussed in Section 7.3.

4.2.4 Old Scots Use of ‘Relevance’ 1100 to c1800

The first records of ‘relevance’ terms used in the English language are from Old Scots. The origins of ‘relevance’ is documented in *The Dictionary of the Scots Language* (DSL). This dictionary comprises the two major historical dictionaries: (i) the *Dictionary of the Older Scottish Tongue* (DOST), which contains information about Scots words in use from the 12th century to the end of the 17th century and (ii) the *Scottish National Dictionary* (SND), which contains information about Scots words in use from the 18th century to the present day. OED (1989) also provides some early quotations from the Scots. The definitions in DSL are written in modern English but all the quotations from DOST are in Old Scots, which is almost another language. It would be worth analyzing these quotations but I do not have sufficient time to translate all the unusual terms. Instead, I have collected all definitions of ‘relevance’ terms from DOST and analysed the quotations from OED. Appendix 1 provides definitions of ‘relevance’ terms.

The two terms ‘relev’ and ‘relation’ appear to be the semantic wellspring of ‘relevance’. The term ‘relev’ is a semantically complex word that originated around 1375. It has been adapted from the Latin ‘relevāre’, particularly the senses ‘to raise again’ and ‘assist’ and its early use was with reference mainly to help given in a battle. Since then its sense has expanded to include many kinds of assistance: (i) rescuing a person from trouble, difficulty or danger; (ii) bringing or giving aid to someone by one’s action; (iii) assisting a person by donation or providing necessary provisions; (iv) freeing a person or community from mental pressure/distress, physical pain or discomfort, punishment, penalty, legal obligation, or financial burden; (v) freeing a person, bird, or ship from bondage or captivity; (vi) making a need or weakness less harmful or oppressive; (vii) exalting or elevating a person or thing or raising in rank, standing, or condition; and (viii) recovering or regaining land (DOST).

Based on the number of senses and not necessarily frequency of use, the chief application of ‘relev’ is in reference to humans or human problems or interests. Occasionally, direct reference

is to land or a ship but these are a person's property (interest) for which relief was either sought or given. The application of 'relev' to a bird is similar in that it concerns a bird's interests; in particular, its interest to be freed when held in captivity. Thus, most senses of 'relev' apply to beings that encounter problems or have interests. It is evident how the notions of 'raise' and 'help' are combined. When in need of help, we are down and need a hand up. 'Relev' conceptualizes that elevation. However, the sense of 'relev' referring to the exaltation or elevation of a person or thing or raising something in rank, standing, or condition (sense vii above) is a broader notion. It concerns the attribution of significance to something, which is a subjective evaluation.

The term 'relation' originated in the Scots language around 1390 and, up to about 1600, it referred to a narration or report. In law, it specifically referred to a witness's statement of the circumstances known to him. However, around 1661 'relation' acquired senses of (i) making a relation either to something or of a matter and (ii) making a reference or allusion. Around this time, 'relation' also became more general to include any connection or correspondence whatsoever. The words 'relative' and 'relate' also centre around mostly the early senses of 'relation' (DOST).

The early Scots concept of relation appears to be limited to whatever a person might formally or informally say. In court, for example, a narration would be given on the speaker's behalf or against someone within the context of an allegation made before a judge. Generally, then, this sense of relation applies to an element of communication. The later conception of making or representing any relation is much broader than the earlier sense in that it applies to any system, not just a communication system. Interestingly, a speaker defending himself or being defended does so against a charge or accusation. DOST defines the Old Scots term 'charge' most generally as a load, weight, or burden. More specifically, 'charge' is defined as (i) a task, duty, or commission laid upon or assigned to one; (ii) task of looking after something; (iii) an accusation; (iv) an injunction, command, or order; and (v) responsibility or blame. Accordingly, a charged person seeks relief, a lightening. Also, 'burden' in Old Scots means a heavy bundle of sticks, usually slung over one's back and a burden-taker is someone who takes responsibility for another. So, a representative of an accused person takes on the responsibility to relieve the charge and the prosecutor takes on the burden of proving the charge; i.e., justly placing a burden on the accused who may or may not have placed a burden on someone else.

The later acquisition of 'allusion' by 'relation' is of interest to the development or continuance of 'relevance', which emerged in Scottish courts about 140 years earlier than this

sense of 'relation'. The term 'allude' means to play upon words (OED) or refer indirectly; i.e., to mention something or somebody, usually briefly, without giving a precise name or explicit identification but usually making clear by other means to whom or what reference is made (*Encarta* 2004). One can see how the courts might not approve of such indirectness and implicitness and how essential points of a narration must be raised up from a welter to be clearly and explicitly considered by a judge. Further, of all that might be explicitly narrated in court, the problem is to determine what actually connects the allegations and statements to legal principles; hence, what ought to be elevated above the fray to be considered by a judge, who is a higher authority to whom we rise when he/she enters the courtroom.

The acquisition of the notion of allusion by 'relation' is also interesting in that the term allusion is a form of the Latin *ludere*, which means 'to play' or *ludus* which means 'play or game'. In particular, it means to pretend to be or act as if something were true (*Encarta* 2004). These forms also supply a root meaning to the words (i) 'ludicrous', which means absurd, incongruous, impractical, or unsuitable; (ii) 'collude', which means to work secretly with somebody particularly to do something illegal or undesirable; (iii) 'delude', which means to lead into false belief or to persuade somebody to believe in something that is untrue or unreal (iv) 'elude', which means either (a) to escape from or avoid somebody or something by cunning, skill, or resourcefulness or (b) to be beyond somebody's understanding or be unable to be recalled, which specifically comes from the Latin *eludere* - to deceive, escape from, win from somebody at play; and (v) illusion, which means a deceptive appearance or a false idea, conception, or belief concerning something (*Encarta* 2004). In all cases, relations between objects are evaluated and the judgment of no connection is expressed, as is with an irrelevance judgment. For example, (i) ludicrous concerns the incongruity of two statements; (ii) collude concerns the disconnection between one's plans or actions and another's knowledge of them and the law; (iii) delude concerns a statement that does not correspond to what a person claims the statement represents; (iv) elude concerns the disconnection between a person and others or what one wants to recall and what can be recalled; and (v) illusion concerns the disconnection between an appearance, idea, conception, or belief and that which is represented by such objects. Accordingly, all of these words are related to relevance in that relevance also concerns connection/disconnection between objects.

The adjectival term 'relevant' came into the Scots language around 1516. It was first used in a legal context to mean (i) legally pertinent, competent, or sufficient or (ii) conformity with

correct legal procedures or rules (DOST). For example, OED provides the following quote from Scottish law: “[They] find the libel relevant to infer the pains of law” (Appendix 2). Given that to be pertinent, competent, or sufficient a statement must conform to correct legal procedures or rules, these two senses are co-extensive. The SND notes that the Scots word ‘relevant’ is similar to (i) the French word ‘relever’, which means ‘to be dependent on’, and (ii) both the Italian word ‘rilevare’ and Spanish word ‘relevar’, which mean ‘to be of importance or consequence’. The Italian and Spanish terms are similar to the Scots word ‘relevant’ because any statement containing the notion of significance expresses an *n-ary* relation between objects, which means any such statement presupposes a connection between at least two objects. The Scots word ‘relevant’ used in a legal context must also include the notion of significance because what is considered in a legal decision must be of significance. What is not considered in a judgement is that which is insignificant. The degree of significance and its determination is another matter, which can be a central strategic or pragmatic concern (see Section 6.2). The French word ‘relever’, meaning ‘dependent on’, might be a broader conception in that it might refer to any relation.

As the context of use and definitions of Old Scots ‘relevance’ terms show (Appendix 1), (i) all first relata concern such conceptual objects as allegations, pleadings, actions, and defenses and (ii) second relata concern such conceptual objects as legal procedures, rules, or cases, although procedures may also be factual. In general, the relata concern whatever is brought before the court and aspects of decisions that the court must make. The relational terms include pertinent, competent, sufficient, conformity, bearing, supporting, applicable, and propriety.

4.2.5 Scots and English Usage c1800 - 2004

According to the *Scottish National Dictionary* (SND), the original Scottish sense of ‘relevant’ as ‘pertinent or germane to any matter’ became standard English only in the late 18th century. Samuel Johnson (1755) included only the term ‘relevant’ in his *Dictionary of the English Language* and only on the testimony of some earlier dictionaries; e.g. Bailey, who prepared two general dictionaries in the 1700's. These earlier dictionaries took ‘relevant’ to mean ‘relieving’, which is a translation of the original French (SND). Nonetheless, SND reports that the Scottish sense of ‘relevant’ might have come into English usage through Parliament as it appeared in a work of Burke's. SND does not provide a reference to Burke's work but presumably they are referring to Edmund Burke, the 18th century English parliamentarian. SND explains that Burke's definition is

an extension from the original and still current application in Scottish Law; i.e., the sense of legally sufficient, pertinent or adequate, especially of a claim, charge or defence, where the factual statements alleged, if proved, would justify the granting of the penalty, remedy or discharge sought.

Aside from the etymology, SND distinguishes between ordinary and legal senses of ‘relevant’ and defines it by listing its synonyms. The ordinary sense is “to be pertinent or germane to any matter”. The “still current” Scottish legal sense is “legally sufficient, pertinent or adequate, esp. of a claim, charge or defence, where the facts alleged, if proved, would justify the granting of the penalty, remedy or discharge sought.” The structure of the definition is as follows:

Sense	1 st Relatum		Relational Term	2 nd Relatum
Ordinary	x		<ul style="list-style-type: none"> • relevant • pertinent • germane 	<ul style="list-style-type: none"> • any matter
Legal	<ul style="list-style-type: none"> • factual statements 	<ul style="list-style-type: none"> • claim • charge • defence 	<ul style="list-style-type: none"> • legally sufficient • legally pertinent • legally adequate 	<ul style="list-style-type: none"> • penalty • remedy • discharge

Concerning the ordinary sense of ‘relevant’ and given that ‘matter’ refers to both (i) physical objects, causes, events, states, or acts and (ii) subjects, themes, topics or questions treated in written composition or discourse (SND), no limitation to the second relatum is specified. Whether this actually bears out upon examining the quotations remains to be seen, and would need to be done by someone who has access to the old Scottish legal literature and knows the Old Scots tongue. In contrast, the second relatum of the legal sense of ‘relevant’ is limited to legal concepts/decisions or post-judgment acts, all of which pertain to human beings. Despite the intervening conceptual objects within such a relevance statement, the relations are ultimately fact to fact, given that legal decisions concern (i) a person’s acts (e.g., possible killing) and facts related to a person’s acts (e.g., a weapon) and (ii) court actions that follow judgment (e.g., confinement of the person). So, one would say that the fact of killing a person is relevant to the fact of imprisoning the murderer. The process of investigating the crime, laying the charges, and judging are all facts but these are guided by legal principles, which are conceptual. Here, the relevance relation between principles and factual procedure is pragmatic. Further, the acts of a crime are factual. But when acts are represented conceptually in factual statements, a referential relation is created between the statement and fact. Further, when the factual statements are employed to support another statement/conclusion (e.g., that a particular person committed a crime), a conceptual relation is

constructed, specifically an inferential relation. Finally, the verdict and sentencing judgment are conceptual objects that have a referential relation to a future state. This relation is also a prescriptive, pragmatic relation in that it determines future acts and states; i.e., it determines generally what ought to be done to the convicted person. Both are concept-fact relations.

The OED's definitions, quotations, and relata are shown in Appendix 2. These include both Scottish sources from the 1500's and later English sources. I have kept the Old Scots and later English quotations together to show a continuous historical record. Also, some of the early Scottish quotations from OED differ from those reported by SND. Each table in Appendix 2 presents a classification of relata. As shown, the relations are fact-concept, concept-concept, concept-fact, and fact-fact. The first three categories involve human concerns such as issues, decisions, or interests. Generally, they involve inquiries, arguments, education, social regulation/law, and pragmatic concerns. Fact-fact relations need a closer examination.

Table 14 outlines quotations from which I have identified factual relata and identified the context of the quotation. Part of the difficulty of analyzing these quotations arises from ambiguities; specifically, determining whether or not the referent is a factual or conceptual object and exactly what that object is. In some cases, the object can be either factual or conceptual. Where a statement could be constructed using factual relata, I have included the quotation in this table and have analysed and evaluated it accordingly.

The 1818 quotation (*All Fools' Day, It will come in most irrelevantly and impertinently seasonable to the time of day.*) concerns a relation between a day of celebration (events) and the context within which it was to occur. OED defines 'time of day' as (i) hour of the clock, period of the world's history, etc; (ii) the hour or exact time as shown by the clock; hence, a point or stage in any course or period; and (iii) not to help or cooperate with (a person) at all, to be surly or mean towards (colloq.); and (iv) the prevailing aspect of affairs; the state of the case (colloq. or slang). Given the relation between the event and the state within which it is about to occur, a non-specific judgment about its timing is also expressed, which might be that the event is inappropriate. In any case, the relevance statement concerns human affairs, which are subjective concerns.

The 1823 quotation (*A Poor Relation..is the most irrelevant thing in nature.*) concerns a relation between two blood relatives but it is difficult to interpret in specific terms. It might be an emphatic statement that places a poor person within the context of all that exists and expresses an opinion about the writer's or other person's attitudes toward a poor relative. It might also suggest

Table 14. Fact-Fact Relations in OED Relevance Quotations.

Context	Term/Sense	Quotation	1 st Relatum	2 nd Relatum	Date
Celebration Timing	<i>Irrelevantly</i>	All Fools' Day, It will come in most irrelevantly and impertinently seasonable to the time of day.	All Fool's Day	time of day	1818
Socio-economic Status	<i>Irrelevant</i>	A Poor Relation..is the most irrelevant thing in nature.	poor relation	<person related>	1823
Economics: Supply and Demand	<i>Relevant 1b</i>	Population and the supply of food must be exactly relevant.	population	food supply	1868
		The value..is absolutely relevant to the demand for them.	value of an unspecified item	demand	1868
Pragmatic: Concerns or Acts Moral Concerns Decision	<i>Irrelevancy</i>	To use the weapons of one of these societies against a sin or error in the other society, is a total irrelevancy and misapplication.	a weapon from one society <regulation and/or act>	sin or error in another society	1876
	<i>Relevance</i>	What relevance had such a fact to the duty of the hour?	fact	duty of the hour (act or duty)	1890

Legend: < x > an assumed object.

that anyone ought to have the same opinion about a poor relative. Within this opinion, a specific attitude toward the poor person is suggested but is not made explicit. Further, because attitudes lead to acts, the quotation might also imply how a poor person ought to be treated. In any case, the irrelevance statement concerns subjective beings; specifically, a wealthier person's regard or treatment of a poor relative. So, the relevance statement expresses a fact-concept or fact-fact relation, but within the realm of subjective beings.

The 1868 quotations, (i) *Population and the supply of food must be exactly relevant* and (ii) *The value..is absolutely relevant to the demand for them*, make use of a peculiar sense of relevant; i.e., proportionality or correspondence. These are relational statements but quite distinct from other senses of relevance in that they can include any factual relations; i.e., non-subjective relations. The idea of any proportionality might be an extension from an original definition of 'relevance' made by Dalrymple (1681) in *The Institutions of the Law of Scotland* (OED; App. 2). Here, he defined relevancy as follows: "The meaning of Relevancy (which is more accustomed with us, than else~where) imports the Justice of the point, that is alledged to be Relevant." From the definition alone, it is not clear exactly what he meant but he could mean that relevance is the relation between a point and legal principles. (See discussion below on a similar, later definition.) That is, for a point to be relevant it must correspond or connect to or fall within legal principles.

The idea of proportionality might come from Aristotle, or other Ancient Greeks, who held that justice is a matter of proportionality. However, the appearance is that relevance as proportionality has gone beyond the original limitation to justice issues and now includes any relation of proportionality.

The 1876 quotation (*To use the weapons of one of these societies against a sin or error in the other society, is a total irrelevancy and misapplication.*) concerns a relation between either (i) social policies that regulate acts or military technology or (ii) acts that occur in one society and their use in another society, given acts of sin or error that have occurred there. As a fact-fact relation, it is a statement of appropriateness concerning societal relations, or more specifically subjective relations.

The 1890 quotation (*What relevance had such a fact to the duty of the hour?*) concerns a relation between an unspecified fact and an unspecified duty of the hour. People use the word ‘fact’ ambiguously to mean either a factual object (e.g., thing) or conceptual object (e.g., statement representing a thing). Concerning ‘duty of the hour’, OED defines duty either as an obligation, which is a conceptual object, or as an act, which is a factual object. Without knowing more about the context of the quotation, determining the intended sense of duty is not possible. Nonetheless, I have classified this quotation as a fact-fact relation, or more specifically a fact-act relation, because someone could make such a statement. *Encarta* defines ‘of the hour’ as ‘enjoying the highest degree of relevance, importance, or popularity at the current moment or particular time’ and OED defines it generally as ‘a definite time, an appointed time, an occasion’ and specifically as ‘of the present hour, of the very time that is now with us’. In any case, the statement expresses a human concern. So, the relation is between an unspecified fact and a subjective being.

A few quotations use both a relevance term and a term that is used to define relevance. For example, the 1818 quotation on All Fools Day states that it has come in most “irrelevantly and impertinently” and the 1876 quotation on societal weapons states that their use in another society is a total “irrelevancy and misapplication”. Further, the 1878 quotation, “*His Irish enterprise had lost its appositeness and relevancy.*”, is similar (App. 2). It is difficult to know, without context, whether such usage is redundant or whether the writers were trying to make a distinction. So, the outstanding questions concern whether the terms, as used, (i) are equivalent conceptually and, if so, the redundancy may be a matter of emphasis or clarification by being more specific or (ii) overlap conceptually. In the case of the weapons quotation, ‘irrelevancy’ might be applied to conceptual

objects (policies) and ‘misapplication’ might be applied to facts (acts).

Finally, one of OED’s quotations is from an 1838 dictionary of Scottish Law by William Bell. In his words: “*The relevancy of the libel is the justice and sufficiency of the matters therein stated to warrant a decree in the terms asked.*” SND does not have an entry for ‘justice’ but DOST defines it as follows:

1a. Administration of the law in maintenance of right or equity; judicial execution of the law by assignment of reward or punishment; also, the judicial proceedings attendant upon these.

b. Legal redress of wrong; the granting of one’s rights by the intervention of the legal authority.

2. Justice in the administration of the law; equity.

SND provides the explanation that ‘sufficient’, an adjective, is applied to a wide range of objects and means ‘substantial, solid, adequate in regard to strength or condition’. SND does not have an entry for ‘substantial’ but has one for ‘substantious’ which is defined as substantial. So, turning to DOST ‘substantial’, an adjective, is defined as (i) material and (ii) that which involves an essential point or feature or something that is material, significant, or of major importance. It defines ‘substance’, a noun, as (i) essential nature, essence and (ii) corporeal nature, physical reality. DOST also has an entry for the term ‘sufficiand’, which in legal contexts is applied to pledges, testimony, and witnesses. It means ‘adequate or satisfactory; specifically, conforming to the requirements of the law’. Given the definitions of ‘justice’ and ‘sufficient’, it is not clear why Bell used the two terms, assuming he used them to distinguish concepts. However, an overlap occurs between the two senses. Both refer to the idea of consistency or conformity to the law. ‘Sufficient’ relies on the notions of strength and significance but, upon analysis, ‘justice’ might also refer to such ideas. Nonetheless, it appears that what he means is that the libel/case must conform to law and be significant enough to warrant application of it. As in the original Scottish usage, relevance is taken to be a relation of significance. Hence, it excludes non-subjective fact-fact associations; such as, grains of sand on a beach or elements of a chemical compound. I suspect that such an explanation accounts for the ‘unnatural’ sound or sense of incorrectness, which occurs at least to me, when speaking of a water molecule and saying ‘hydrogen is relevant to oxygen’ but not when saying the more general ‘hydrogen is associated with oxygen’.

4.3 Cross Comparison of Current General Dictionary Definitions

4.3.1 General Nature and Structure of Definitions

Tables 15 and 16 contain definitions of ‘relevance’ and ‘relevant’ from five general dictionaries. These definitions have been analysed into their component parts. Common to all definitions is a system of terms and concepts that have a similar structure. Specifically, two sets of objects (relata) are connected by various relational terms/concepts. The first relata are mostly unspecified or nondescript but the second relata are identified as various factual or conceptual objects expressed at varying degrees of generality. The relational terms also vary in degree of generality. The general structure of each definition can be formalized as semantic (S), conditional (C), and abstract statements (A), as follows:

S_1 : Object x is relevant to object y means that x is related to y .

C_1 : If x is relevant to y , then x must be related to y .

C_2 : Whenever x is relevant to y , then x must be related to y .

A_1 : ‘ xRy ’ or ‘ Rxy ’, where R ambiguously refers to ‘relevant to’ and ‘related to’.

A_2 : $xR_1y \rightarrow xR_2y$, where $R_1 =$ ‘relevant to’ and $R_2 =$ ‘related to’.

A_3 : $(x^{R_1} \rightarrow y) \vdash (x^{R_2} \rightarrow y)$.

At this point, it is an open question whether we can write the bidirectional ‘ $xR_1y \leftrightarrow xR_2y$ ’, which presupposes that ‘relevance’ is conceptually equivalent to ‘relation’; their use is interchangeable; and, when used, they yield synonymous expressions. In other words, the set relation between relevance and relation is one of complete overlap. (See Section 6.1).

As is evident from Tables 15 and 16, definitions of ‘relevance’ and ‘relevant’ are very similar, with the exception of Merriam-Webster’s definitions of ‘relevance’ and ‘relevant’, where the former contains different specific senses even though ‘relevance’ should subsume all definitions of ‘relevant’. This is clear when considering the second difference to notice, which is that of grammatical function. ‘Relevance’, by way of the suffix *-ance*, refers to a state and functions as a noun that literally represents something raised up or, perhaps more specifically, something selected, isolated, and brought to attention. That ‘something’ is proximately a conceptual system and being expressed through a sign system it must refer to and correspond with an established conceptual system and, at times, ultimately a factual system. So, relevance, in this particular sense, names the system ‘ xRy ’. Of course, a more general function of ‘relevance’ is to name a particular theory of relevance or a set theories. Here, the term sits at a higher level of abstraction than its use

Table 15. Definitions of 'Relevance' from General Dictionaries.

Source	Definition	Relational Term	1 st Relatum	2 nd Relatum
Merriam Webster	1. Relation to the matter at hand.	relation	x	matter under consideration
	1b. Practical and especially social applicability : Pertinence	applicability pertinence	x <means>	anything social <ends>
	2 : The ability (of info retrieval system) to retrieve material that satisfies the needs of the user.	satisfaction	material	info system user needs
American Heritage	1. Pertinence to the matter at hand.	pertinence	x	matter at hand
	2. Applicability to social issues: e.g., a governmental policy lacking relevance.	applicability	x (gov't policy)	social issues
	3. CompSci: The capability of a search engine/function to retrieve data appropriate to a user's needs.	appropriateness	data	info system user needs
Cambridge Intern'l	1. The degree to which something is related or useful to what is happening or being talked about.	degree of relatedness degree of usefulness	x	an occurrence topic of discussion
OED	1a. Relevancy the quality or fact of being relevant; (i) bearing upon, connected with, pertinent to, the matter in hand (ii) correspondent or proportional to something).	bearing upon connected with pertinent to correspondent to proportional to	x	matter in hand something; y
	b. A relevant remark; spec. in recent use, pertinency to important current issues (as education to one's later career, etc.); social or vocational relevancy.	pertinency	remark education	y current/societal issues vocation
Encarta	1. Connection: the sensible or logical connection that one thing has with another, for example, a matter being discussed or investigated.	connection sensible connection logical connection	x thing	thing (y) (matter being discussed) (matter being investigated)
	2. Applicability to current issues: applicability to or connection with real-world issues, present-day events, or the current state of society.	applicability connection	x	current issues (real world issues) (current events) (current state of society)

Legend: () = examples rather than delimiting terms of a definition.

◇ = assumed object.

Table 16. Definitions of 'Relevant' from General Dictionaries.

Source	Definition	Relational Term	1 st Relatum	2 nd Relatum
Merriam Webster	1a. Having significant and demonstrable bearing on the matter at hand.	bearing	x	matter at hand
	b : Affording evidence tending to prove or disprove the matter at issue or under discussion.	evidence proof	x	matter at issue matter under discussion
	c : Having social relevance.		x	social y
	2. Proportional, relative.	proportional relative	x	y
American Heritage	Having a bearing on or connection with the matter at hand.	bearing connection	x	matter at hand
Cambridge International	1. Connected with what is happening or being discussed.	connected with	x	an occurrence topic of discussion
	2. Correct or suitable for a particular purpose.	correct for suitable for	x	purpose
OED	1. Bearing upon, connected with, pertinent to, the matter in hand.	bearing upon connected with pertinent to	x	matter in hand
	2. Correspondent or proportional to something.	correspondent to proportional to	x	something
Encarta	1. Connected: having some sensible or logical connection with something else, for example, a matter being discussed or investigated.	sensible or logical connection	x	something (matter discussed) (matter investigated)
	2. Having social significance: having some bearing on or importance for real-world issues, present-day events, or the current state of society	bearing importance significance	x	society real world issues present day events current state of society

Legend: () = examples rather than delimiting terms of a definition.

<> = assumed object

in particular relevance statements. In contrast, 'relevant', by virtue of the suffix *-ant*, functions as an adjective and is associated with the first relatum of the relational statement. But, as is evident in all the definitions, the function of 'relevant' is not to describe the first relatum, as other adjectives would, but rather to indicate a connection between the first and the second relata. So, the adjectival view places undue emphasis on the first relatum at the expense of the connection or second relatum, as does 'relevant' when used as an adjective. Such a position is at odds with an adjectival view of 'relevant', which takes it to represent properties of the first relatum; e.g., properties of a premise set (Blair 1989, 1992; Johnson 2000). Now, I said that 'relevant' has an indicator function, which means 'relevant' itself does not connect. Rather, humans connect the relata both cognitively when thinking and physically when writing or speaking. Further, when we make an assertion, as mentioned with 'relevance', we must employ language correctly, which means we must conform to grammatical and semantic conventions, and we must represent referents (ideas or facts) correctly. In both cases, the referent of a relevance statement, being a relational statement, is not just an individual object but a system of objects. In other words, a relevance statement asserts that a connection occurs between two objects, which identifies a system. So, the essential problem in evaluating a relevance statement is to determine whether or not the relata are correctly identified and are connected as asserted.

4.3.2 Nature of the 2nd Relata

Table 17 presents all 2nd relata from general definitions of both 'relevance' and 'relevant'. I have separated the most general senses of each term's definition from more specific senses. I have also separated terms of a definition that delimit a semantic category from terms that identify examples used to illustrate a particular semantic category.

2nd Relata of General Senses of 'Relevance' and 'Relevant'. Of the twelve general senses of 'relevance' and 'relevant', two of the 2nd relata are topics of discussion (CI), six are a matters at hand (M-W, OED, AH), two are things (E), and two are occurrences (CI). First, a 'topic of discussion' is a very general relatum that is expressed through physical objects (sounds, inscriptions) and occurs within a communication event. Accordingly, such a relevance relation occurs only within the context of an information exchange between at least two persons. These may be immediate in face-to-face spoken exchanges or drawn out over time in written communications, providing that someone reads and responds to the initial written work. Further, any communication

Table 17. Comparison of Second Relata in General Dictionary Definitions.

	Source	2 nd Relata	
		Relevance	Relevant
General Senses	MW	matter under consideration	matter at hand
	AH	matter at hand	matter at hand
	OED	matter in hand	matter in hand
	E	thing (y) (matter being discussed) (matter being investigated)	something (matter being discussed) (matter being investigated)
	CI	topic of discussion	topic of discussion
		an occurrence	an occurrence
Specific Senses	MW	ends anything social information system user needs	matter at issue or under discussion that is to be proved/disproved social y
	AH	social issues information system user needs	
	OED	current issues societal issues vocation/education	y/something that is proportional or correspondent
	E	current issues real world issues current events current state of society	society real world issues present day events current state of society

Legend: () = examples, not the delimiting terms of a definition; MW=Merriam Webster's Online Dictionary; AH = American Heritage; E= Encarta; OED=Oxford English Dictionary; CI=Cambridge International Dictionary.

event presupposes both cognitive acts, through which concepts are associated and the relevance relation is established, and referents to the conceptual and symbol associations. From an audience perspective, the sounds/inscriptions are the immediate point of contact to identify the symbolically represented referents that are claimed to be associated as asserted. Of course, problems of concept formation and communication can interfere with the successful transmittal of intended information and this context must be considered in any evaluation of such relevance claims. Semantically, the topic of discussion creates a frame of relevance which determines what can be appropriately brought into relation with it. Its function, then, is similar to a question, hypothesis, or theory. In other words, the 2nd relatum limits or determines the 1st relatum. Walton (1982, 1999) explores the notion of topical relevance but uses different terms and provides a different explanation and structure.

Second, 'matter at hand' refers generally to a current consideration and specifically to a current judgement or decision (M-W, OED, AH). Such a relevance relation can be (i) formulated

when a lone person deliberates or (ii) expressed when individuals exchange information in a communication event. The temporal restriction to a current activity is specified but is unnecessary because a relevance relation does not disappear after a decision has been made, providing that it is physically encoded somehow. Further, we can easily distinguish temporal frames with expressions such as ‘x is relevant to judgment y’ and ‘x was relevant to judgment y when it was made’. Consequently, the definition should be revised to remove the temporal restriction. Relevance relations concerning judgments are ubiquitous and concern all kinds of deliberations and pragmatic considerations. Normative theories of particular types of relevance relations are researched in, for example, law, science, engineering, medicine, resource management, environmental impact assessment, architecture, and urban/regional planning, communications, and rhetoric. Any formal or rule governed deliberative process (e.g., court proceedings or meetings) specify various types of relevance requirements (e.g., standing and substantive admissibility). For example, standing concerns the right to file a law suit or a petition (Hill and Hill 2002). As such, judgments of standing determine which parties have relevant claims to be heard before the court. Within that, other legal principles determine what information is relevant or admissible. A general theory of relevance must take into consideration such a broad range of types. One such example is pragma-dialectics, which is one type of decision making procedure (van Eemeren and Grotendorst 2004).

Third, the use of ‘thing’ or ‘something’ in *Encarta*’s definition is somewhat problematic because the terms have fifteen and five senses, respectively. What is not clear is whether one, some, or all senses delimit the second relatum. These senses range from any nondescript object to more specific objects such as details, aims, garments, or deeds. The thing is, the referent of ‘thing’ must be identified by considering the context within which either ‘thing’ or ‘something’ is used. Even so, the examples given for *Encarta*’s definitions of ‘relevance’ and ‘relevant’ give us some guidance as to what they mean. The examples concern matters being discussed or investigated. Further, given that *Encarta*’s definition specifies a logical connection between relata and they define ‘logical’ as ‘based on facts’ (specifically, clear rational thought and sensible reasoning), the second relatum would be a conceptual object because such objects occur in reasoning. However, *Encarta*’s definitions also refer to a *sensible* connection between things, which is ambiguous. They define ‘sensible’ in terms of good reason, practicality, perception, consciousness, and awareness. This also ties in with a sense they give for ‘logic’, which is the “inescapable relationship and pattern of events: the relationship between certain events, situations, or objects, and the inevitable

Table 18. Cambridge Dictionary's Examples of Relevance Statements.

Example	1 st Relatum	2 nd Relatum
(a) Education should be relevant to the child's needs.	education	child's needs
(b) For further information, please refer to the relevant leaflet.	leaflet	information needs
(c) The point is highly relevant to this discussion.	point	discussion
(d) I'm sorry but your personal wishes are not relevant (= important) in this case.	personal wish	a particular case

consequences of their interaction.” In any event, I will take into consideration the possibility that they treat the second relatum as either a conceptual or factual object.

Fourth, the *Cambridge Dictionary* defines the second relatum identified as ‘what is happening’ or ‘discussion’ as a current occurrence, which is a fact. Setting aside the temporal restriction, it is not clear how they arrived at that specification given their examples, as outlined in Table 18. Concerning (a), education is certainly a process and a complex one that involves, at a minimum, a teacher and/or information and a student. So, it involves both factual and conceptual objects and a complex set of relevance relations between facts (teacher-teacher, teacher-student, student-employer, student-environment) and conceptual objects. Concerning (b), presumably the statement was made within a discussion. However, the leaflet (fact) is relevant to an information need (mental state represented linguistically) only because it contains information (concepts) required. So, the leaflet itself is only derivatively relevant. Concerning (c), a discussion is an occurrence, for sure, but a point is not relevant to the factual occurrence of the discussion itself but to other conceptual objects expressed within a discussion and to the topic of discussion. So, the act of discussing is also derivatively relevant. Concerning (d), the example contains a vague reference to a nondescript case to which wishes are apparently irrelevant. If the case is an occurrence like a discussion, previous comments apply to the definition. If the case is a topic, then the relation is between the topic (concept) and a linguistic expression of a personal need (concept→fact). Further, it is not clear why ‘relevant’ in this example must be restricted to importance. If the case is a traffic violation like speeding, then my personal wishes of not paying the fine are not *connected* to the case by virtue of legal principles that rule out such considerations. As such, my personal wishes can have no *importance* to such a case. This example emphasises that importance is relational and, hence, presupposes a connection between two objects. All examples indicate why taking a systems view of relevance statements is necessary to their analysis and evaluation.

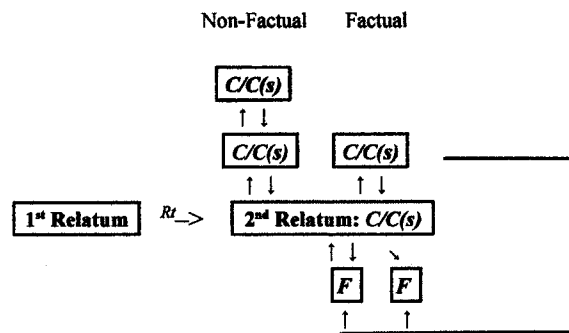
Encarta's definition possibly identifies the second relatum also as a fact. As discussed, this possibility arises from their definitions of 'thing', 'logical', and 'sensible'. Given that the first relatum is also identified as a thing, two associated factual objects can be in a relevance relation as opposed to a relation between a fact and a conceptual object. The differences are (where Na = sodium and Cl = chloride):

- (i) Fact $R_f \rightarrow$ Fact
Na $R_f \rightarrow$ Cl
- (ii) Fact $R_v \rightarrow$ Topic
Na $R_v \rightarrow$ Synapse Function
- (iii) Fact $R_v \rightarrow$ Research Objective
Na $R_v \rightarrow$ Determination of Neural Mechanism

The issue here is whether or not 'relevance' and 'relation' are synonymous terms or 'relevance' is a subcategory of 'relation', which is a matter I will take up in Section 6.1.

2nd Relata of Specific Senses of 'Relevance' and 'Relevant'. Of the 19 types of relata identified, two main groups (concepts, facts) and several subgroups are apparent. Concerning conceptual objects, nine concern issues or more specifically social issues (MW, AH, OED, E), one concerns matters to be proved/disproved (MW), one concerns ends/objectives (MW), and two concern information system user needs (MW, AH). Considering factual objects, five concern society or the current state of society (MW, E) and one concerns something that is proportional or correspondent to something else (OED). The first group of conceptual objects all concern either pragmatic (C-F relation), moral (C-F relation), or epistemic matters (C-C or C-F relation), of which all have a cognitive dimension and are human/subject problems. The second group of factual objects includes vague references to 'society'. Because no examples are provided, it is not clear whether issues are implicit or whether or not statements refer to purely factual, non-significant relations. However, given that (i) the context is a matter of applicability and (ii) the factual/social relations would be subject/subject or subject/non-subject relations rather than non-subject/non-subject relations, the definitions must be limited to relations of significance. The sense of 'relevant' meaning proportionality/correspondence can involve any relatum whatsoever. However, OED defines it from a 19th century quotation and Merriam-Webster does not indicate its data base. The question arises whether or not this sense is anomalous or obsolescent.

Figure 1. Relations of the Second Relatum as a Conceptual Object.



To summarize, a conceptual object has a representational function and includes any concept (C) or system of concepts ($C(s)$); such as, a proposition, theory, or classification system. The representational relations are shown in Figure 1. The second relatum is an instance of language use and, through its expression and unless terms are specially defined, the intent is to conform to a pre-established semantic structure. The double arrows between the 2nd Relatum and the conceptual objects indicate a mutual semantic relation. These conceptual objects can refer either to other conceptual objects and ultimately be non-factual or they can refer to facts. The 2nd Relatum can be considered in terms of a direct relation to facts, where the relations would be referential/evidential ($\uparrow \downarrow$) or pragmatic (\searrow).

4.3.3 Nature of the 1st Relata

Most definitions of ‘relevance’ and ‘relevant’ do not specify particular types of objects for the first relatum. Of the 23 senses, only five objects have been specified. These are: material or data retrieved by an information system, remarks, education, and means to an end. These are all facts or concepts and involve human pragmatic or moral concerns. For some reason lexicographers have found it easier or more useful to identify categories for the 2nd Relatum, even if very broad but not for the 1st Relatum, except in reference to a few specific cases. Presumably, a greater variety of types as a whole occur for the 1st Relatum - perhaps even anything. However, in a given instance the first relatum would be limited by the frame established by the second relatum. However, unlike the second relatum that delimits or determines the first relatum, the direction of a relevance relation is from the first to the second relatum; i.e., $x^{Rt} \rightarrow y$; $y^d \rightarrow x$. This will be discussed more specifically in Section 6.1.3. Finally, given that the 2nd Relatum determines the 1st

Relatum, where the former is a conceptual object, as expressed in a relevance statement, the latter must also be a conceptual object because such are the objects that occur in cognitive processes, despite the inclination to associate directly with or think in terms of factual referents.

4.3.4 Nature of Relational Terms

All definitions of 'relevance' and 'relevant' include relational terms, many of which are very general and nondescript. Some have either (i) a descriptive or normative sense; e.g., 'relation', 'connection', 'sensible connection', 'bearing upon', and 'correspondence'; (ii) a normative sense; e.g., 'correctness', 'suitability', 'usefulness', 'applicability', 'pertinence', 'satisfaction', 'importance', and 'significance'; or (iii) a descriptive sense; e.g., 'proportionality'. Concerning proportionality, although it can have a purely descriptive sense (e.g., length vs. width of a rectangle), the quotations used by OED to construct the definition are normative (App. 2). A further analysis of the definitions of relational terms should be conducted to provide a better understanding of the conceptual ground that 'relevance' covers as well as its structure.

4.4 Reduction of Merriam-Webster's General Definition of 'Relevance'

To clarify the conceptual structure of dictionary definitions of 'relevance' and 'relevant', we need further definitions of the terms that compose each definition particularly because 'relevance' and 'relevant' are defined so broadly. Although worthwhile, this is a time-consuming and laborious task. Accordingly, I will limit my analysis to the general definition of 'relevance' from *Merriam-Webster's Online Dictionary* (Table 19). It is selected because it includes the term 'relation', and we are not yet clear on the overlap between 'relation' and 'relevance'. The following analysis of 'relation' is reductive. The intent is to analyse to a level of concreteness that provides a clear semantic structure or discover that the definitions are hopelessly confused and need to be completely revamped.

The definition of 'relation' in *Merriam-Webster's Online Dictionary* (Table 19) is complex, dense, and highly abstract. Further, its elements are assembled like pieces of a puzzle that lie in a box. As such, its intelligibility and utility are compromised, as is 'relevance'. To understand the definition and its relation to 'relevance' we need to (i) isolate the individual propositions; (ii) identify which words refer to the first or second relatum or the relation itself; (iii) determine

Table 19. Reduction of Merriam-Webster's General Definition of 'Relevance'.

Relevance: 1a. Relation to the matter at hand.		
Relational Terms	Relation (noun)	An aspect or quality (as resemblance) that connects two or more things or parts as being or belonging or working together or as being of the same kind; specifically : a property that holds between an ordered pair of objects (as one expressed by <i>is equal to</i> , <i>is less than</i> , or <i>is the brother of</i>).
	Aspect (noun)	1. Appearance to the eye or mind. 2. A particular appearance of countenance (expression, look, mental composure) or a particular status or phase in which something appears or may be regarded.
	Resemblance (noun)	1a. The quality or state of resembling; especially, correspondence in appearance or superficial qualities b. a point of likeness. Similarity. 2. Representation, Image.
	Quality (noun)	1a. Peculiar/essential character: nature; b. Inherent feature: property; c. Capacity/ role 4. A distinguishing attribute: Characteristic. 8 : The attribute of an elementary sensation that makes it fundamentally unlike any other sensation
	Order (noun)	4b. Arrangement/sequence of objects (e.g., mathematical elements) or events in time. 5b. A regular or harmonious arrangement.
2nd Relatum	Matter (noun)	Something under consideration.
	Consider (verb)	To think about in order to arrive at a judgment or decision (proposition expressing a conclusion or determination).
	At hand (adj)	(a) Near in time or place: within reach. (b) Currently receiving or deserving attention.
Reductive Def: An object is relevant to a judgment/decision currently under consideration when the former is connected to the latter by virtue of an aspect (appearance) or quality (essential or inherent feature, capacity, role) of something that functions as a connector.		

whether the 1st and/or 2nd relatum or a third object has aspects, resemblances, or properties that connect relata so they are, belong, or work together or are of the same kind; (iv) ground the definition with concrete examples; and (v) systematically analyse and evaluate the relational concepts and their referents, which requires an adequate inventory, description, and classification. Further, the use of 'specifically' in the second clause of the definition might be misinterpreted because we do not always refer specifically to comparative relations when invoking the term 'relation'. For example, when asserting that Jacob and Wilhelm are the Brothers Grimm, I am doing more than ordering pairs of conceptual objects or artefactual representations of them. I am asserting a common genetic origin, which is an historical, physical relation realized through reproductive processes. So, the second clause identifies just one specific kind of relation.

Table 20. Initial Analysis of Merriam-Webster's Definition of 'Relation'.

Def	1 st Relatum	General Relational Term	Specific Relational Term	2 nd Relatum
1	<ul style="list-style-type: none"> • thing • part 	<ul style="list-style-type: none"> • is connected to • is together w/ • belongs together w/ • works together w/ • sameness of kind 	<ul style="list-style-type: none"> • aspect • quality • resemblance 	<ul style="list-style-type: none"> • thing • part
2	<ul style="list-style-type: none"> • property 	<ul style="list-style-type: none"> • ordered 	<ul style="list-style-type: none"> • equality • brotherhood • lesser magnitude 	<ul style="list-style-type: none"> • property

The definition of 'relation' can be analysed into the following elements.

1. An aspect or quality (as resemblance) that *connects* two or more things or parts...

- (a) as being together
- (b) belonging together
- (c) working together
- (d) as being of the same kind.

2. A property that *holds* between an ordered pair of objects (as one expressed by 'is equal to', 'is less than', or 'is the brother of').

Definition 1 contains at least three categories of terms, depending on how one wants to approach the classification (Table 20). 'Thing' and 'part' are nondescript terms used to designate the 1st and 2nd Relata. The remaining key terms somehow concern 'relation' but how they do and to what they actually refer is uncertain. 'Aspect' is defined in terms of appearance so it identifies a phenomenal object. As such, an aspect does not connect actual things. Rather, it is involved in the connection of mental objects within mental processes, as will be explained later. 'Quality' has a phenomenal sense but also refers to things themselves, particularly their actual or potential properties. In the latter case, a property of an object must function to connect. Similarly, 'resemblance' also has a phenomenal sense but it subsumes the notion of comparison. So, a resemblance is similar to an aspect in that the former is part of a cognitive process. These three terms differ from terms (a) to (d) in sense, function, and/or reference class. For example, the statement 'A lichen is a life form where fungi and algae are together' indicates a general relation between the two kinds of organism but is silent on what connects the two. The connector could be the referent to a relatum or something in between. The statement 'An aspect connects fungi and algae to create the life form lichen' refers to a datum that vaguely represents an unidentified connector, which could be an entire thing, part, process, or property of a relatum or something in between. Likewise, the terms

'quality' and 'resemblance', as parts or secondary properties, presuppose an object.

Definition 2 employs more specific and definite notions of equality, relative magnitude, and brotherhood. The first two are comparative relations that are constructed through a cognitive process. So, overlap occurs between this definition and elements of Definition 1. For 'brotherhood' to be in this category and to be an object of ordering, it must be treated as a linguistic or conceptual object rather than a historical, factual relation.

To provide greater clarity, I have constructed tables to show the structure of definitions for each type of relation as well as corresponding statements. I have also constructed figures to illustrate the nature of the terms found within the definition. They result partly from reverse engineering the definition and partly from an application of the definition. The tables can be read from top to bottom. They are structured into columns that contain 1st Relatum, relational terms, and 2nd Relatum. The relational terms are ranked in order of decreasing generality. Statements are constructed from both a particular sense and the definitions outlined in the corresponding figure. To read the figures, it helps to visualize them like a picture and read from the ground up. Each figure starts at the bottom with an actual, artefactual system and progresses upwards to a depiction of the system's perceptual representation, to a conceptual representation of the artefactual system as attained through perception of it, and then to a related set of definitions.

Definition 1a/b: Being/Belonging Together. Figure 2 and Table 21 concern the relation of being or belonging together by virtue of an aspect, quality, or resemblance, where each of these three terms is reduced to a part or property of an object. Figure 2 contains the system $S(s)_1$ or '☉-☉-☉', which I have just represented here with black objects, whereas the original factual system in the figure is larger and darker. Three objects occur together and are connected by dashes. A binary relation within the system is composed of two objects (☉,☉) connected by a third object (-). Other systems, like two pages glued together or two 2x4's fastened with a 3" common nail, are also composed of two objects connected by a third object. How these objects are connected is a matter of physics. For example, the means of connection in the case of (i) '☉-☉-☉' and glued paper involves the adhesion of ink and glue to paper, respectively and (ii) the nailed 2x4's involves friction between the nail and wood. In the case of '☉-☉-☉', they belong together because I designed them to be together to meet my purpose in elucidating the notion of relation. As a corollary, someone who would take them apart or their becoming otherwise disconnected would frustrate my intentions, which is another way of saying they belong together. Now, a nut and a bolt are held

Figure 2. Characterization of a Factual System that Corresponds to Definition 1(a)/(b).

Verbal Definitions of Abstracted Percepts	S = _{df} a system $S(s)$ = _{df} $\langle s, c_1, s_2, c_2, s_3 \rangle$ c = _{df} a dash that connects Objects s_1, s_2, s_3 in $S(s)$ s = _{df} a sun shaped object generated by a human through a human constructed computer s_1 = _{df} an s occupying the left hand position of sytem $S(s)$ s_2 = _{df} an s occupying the middle position of system $S(s)$ s_3 = _{df} an s occupying the right hand position of system $S(s)$
Designation	s_1 c_1 s_2 c_2 s_3 ↓ ↓ ↓ ↓ ↓
Abstraction of Percepts (representation)	\odot - \odot - \odot \ \ \ / \ \ \ /
Percept of Factual System (representation)	\odot - \odot - \odot \ \ \ / \ \ \ /
	↓ ↓ ↓ ↓ ↓
Factual Systems	\odot - \odot - \odot \ \ \ / \ \ \ /

Legend: \ / = referential relations.

Table 21. Relation Definition 1(a)/(b): An aspect or quality (as resemblance) that connects two or more things or parts as being or belonging together.

	1 st Relatum	General Relation	2 nd Relatum
Definition	<ul style="list-style-type: none"> • thing • part 	1. is connected to 2. is together w/ 3. belongs together w/	<ul style="list-style-type: none"> • thing • part
		Specific Relation	
		1. aspect 2. quality 3. resemblance	
Statement	Object s_1...	... is connected by dash c_1 to ...	... object s_2 .
	Object s_1...	... is together with ...	... object s_2 .
	Object s_1, \dots	... within system $S(s)$ and constructed to remain together as assembled, belongs together with...	... object s_2 .

Legend: 1,2,3 = rank of the degree of generality relative to terms in a given set, where 1 is most general.

<> = contains an ordered set

together but no third object keeps them together, which is also the case with hydrogen and oxygen atoms that form a water molecule. The nut resists the pull of gravity when the bolt is held vertically because it rests on the thread of the bolt and remains there by virtue of the friction between touching parts of the nut and bolt. So, here we have just a property of two things that produces the means by which they are related.

None of the mentioned systems involve a phenomenal object as a connector. However, in

such a case, we *see* that one '☆' resembles another '☆' and, by definition, we know that resemblance is a matter of similarity, which is a comparison between two objects or features of them. As such, the relation is a cognitively determined one. That is, we do the connecting through cognitive operations based on percepts and other mental objects (See Fig 6; Definition 2). This kind of relation is fundamentally different from the factual relations outlined in Figure 2 and Table 21. So, we need to remove 'aspect', 'resemblance', and the phenomenal sense of 'quality' from Definition 1a/b and place it in Definition 2 where other comparative relations are identified.

Definition 1c: Working Together. Figure 3 and Table 22 concern the relation of working together by virtue of an aspect, quality, or resemblance. The relevant sense of 'work' is 'effective operation' (Merriam-Webster 2004). Essentially, objects that work together are mechanisms and they include machines, organisms, and individuals in a social system (Bunge 2003). Figure 3 is an illustration of a starter motor, an artefactual mechanism. A real starter motor is held together by bolts, which are individual objects within the system, that cause sufficient friction and pressure to keep the system together. The parts work together by virtue of their design, materials, precise construction, correct assembly, and appropriate supply of electricity. More generally, the parts work together because of their composition, structure, and electrodynamics. How they work together is a matter of physics. Similarly, humans can work together in a group but such a system coheres by virtue of, for example, a common objective, willingness to cooperate, acts of cooperation, emotional/physical rewards for cooperating, and rules to guide acts. So, at bottom, the relation that connects human individuals is a complex system of shared mental objects that are themselves connected within an individual to other mental and internal/external objects and, when these mental objects are acted upon, a host of other mental and physical connections are generated. How this system of mental objects connects individuals within its greater social system is a matter of psychology, neuroscience, philosophy, sociology, history, biology, chemistry, and physics. Again, resemblance plays no role in this sense of relation.

Definition 1(d): Sameness of Kind. Figure 4 and Table 23 concern the relation of being the same kind by virtue of an aspect, quality, or resemblance. To be of the same kind, objects must have common parts or properties. Figure 4 outlines the outcome of a process of observation, definition, and description of the system $S(s)_i$ from which common characteristics of individual objects are determined and compared. However, no extensive comparative analysis is completed to identify exclusive parts or properties of these objects. From the perspective and scale of

Figure 3. Schematic of a Starter Motor to Illustrate Parts that Work Together.

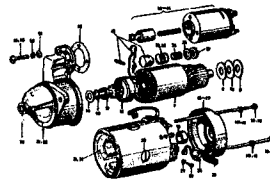


Table 22. Relation Definition 1(c): An aspect or quality (as resemblance) that connects two or more things or parts as working together.

	1 st Relatum	General Relations	2 nd Relatum
Definition	<ul style="list-style-type: none"> • thing • part 	1. is connected to 2. is together w/ 3. works together w/	<ul style="list-style-type: none"> • thing • part
		Specific Relations	
		1. aspect 2. quality 3. resemblance	
Statement	Parts collection 1 ...	... is connected by bolts to ...	... parts collection 2.
	Parts collection 1 ...	... works together with ...	... parts collection 2.

observation when normally reading a printed page, we compare objects in Figure 4 and see that s_1 , s_2 , and s_3 are identical and so are c_1 and c_2 . Each individual of the respective sets obviously differs from others in both the space it occupies and elements that compose it. Further, if we were to magnify the page, we would see minor variances between the objects such as pocks along the surface of the lines. Nonetheless, we can assert that s_1 , s_2 , and s_3 are of the same kind by virtue of their (i) material composition, which is ink; (ii) substrate, which is paper; (iii) shape, which is partly circular, (iv) parts, which include one circle and eight lines per individual; (v) properties of the lines, which include their size, shape, and direction; and (vi) properties of the ink constituting each object, which includes reflectivity of light and the subsequent sensation of olive greenness in humans. So, the objects are connected by an act of comparison that considers aspects, qualities, or resemblance of individual objects. In this case, nothing actually connects the objects to make them of the same kind. But they are connected historically by way of a common origin, which is an

Figure 4. Characterization of a Factual System that Corresponds to Definition 1(d).

Verbal Definitions of Abstracted Percepts	$S(s)_1 \stackrel{=}{\text{df}} \langle s_1, c_1, s_2, c_2, s_3 \rangle$ $c \stackrel{=}{\text{df}}$ horizontal line that connects Objects s_1, s_2, s_3 in $S(s)_1$ $s \stackrel{=}{\text{df}}$ a sun shaped object generated by a human through a human constructed computer $s_1 \stackrel{=}{\text{df}}$ an s occupying the left hand position of system $S(s)_1$ $s_2 \stackrel{=}{\text{df}}$ an s occupying the middle position of system $S(s)_1$ $s_3 \stackrel{=}{\text{df}}$ an s occupying the right hand position of system $S(s)_1$
Descriptions	<p><i>Overall:</i> a physical system generated by a human through a human constructed computer system and occurring either on a monitor or printed page.</p> <p><i>Composition:</i> three sun shaped objects connected by two dashes</p> <p><i>Environment:</i> a rectangle divided by wavy lines.</p> <p><i>Structure:</i> $\langle s_1, c_1, s_2, c_2, s_3 \rangle$</p> <p><i>Mechanism:</i> on a printed page, internal, molecular/atomic physical processes that resist external inputs; i.e., cause the printed objects to endure.</p> <p>s : a circular, olive green object with a perimeter divided into 8 equal segments by 8 short lines that extend outward from the perimeter.</p> <p>c : a horizontal, olive green line positioned between two s's.</p>
Designation	$s_1 \quad c_1 \quad s_2 \quad c_2 \quad s_3$ $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
Abstraction of Percepts (representation)	$\odot \quad - \quad \odot \quad - \quad \odot$ $\backslash \quad \downarrow \quad / \quad / \quad \backslash$
Percept of Factual System (representation)	
	$\downarrow \downarrow \downarrow \downarrow$
Factual Systems	

Table 23. Relation Definition 1d: An aspect or quality (as resemblance) that connects two or more things or parts as being of the same kind.

	1 st Relatum	General Relation	2 nd Relatum
Definition	• thing	same kind	• thing
	• part	Specific Relation	• part
		1. aspect 2. quality 3. resemblance	
Statement	Object s_1, \dots	... is the same kind as ...	... object s_2 .
	Object s_1, \dots	... is a circular object with a perimeter divided into 8 equal segments by 8 short lines and these same parts are possessed by ...	... object s_2 .

algorithm/design proximately in a printer, intermediately in a computer, and ultimately in a human mind (Fig. 5). To note, organisms can be compared on the basis of similarities and grouped into species or distinguished on the basis of differences and these groupings may or may not correspond to ancestral lines, as molecular biologists have shown through DNA analysis of such species as dimorphic yeasts for which similarity/difference of form was originally used to separate species (Guarro, 1999).

Definition 2: Comparative Relations. Figure 6 and Table 24 concern relations between ordered pairs of objects (e.g., ‘is equal to’, ‘is less than’, or ‘is the brother of’) by virtue of a property that holds between those objects. The explication/explanation of comparative relations outlined for Definition 1d holds for Definition 2, with the exception of ‘brother of’. This relation needs a closer look.

Definition 2 specifies ordered pairs of objects. Certainly, we could physically line up two actual brothers and order names in a written or spoken sentence or a proposition such as ‘Jacob is the brother of Wilhelm’. Such are our artefactual creations. However, when we assert a relation of brotherhood, we can mean something entirely different from such ordered pairs. That is, we refer to two individuals who have a common origin or a particular social bond that keeps them together as family or friends. More specifically, a human individual, although unique, is connected to its parents by way of its genetic constituents obtained from the father’s sperm and mother’s egg and these determine an individual’s fundamental identity. The connection between brothers is by way of germ tissue of each parent. In this sense, ‘brotherhood’ refers to the common origin of two individuals. A comparative relation can also be constructed by analyzing gene sequences of each individual. If left at that, the relation is just comparative but we know that the similarity points back to common physical sources and reproductive processes. In contrast, the sense of brotherhood as a social bond is an emotionally and rationally mediated process or situation. As such, the source of the connection is internal/mental but necessarily connected to the external by perceptual and other physical processes (acts). How the bond of brotherhood connects can be considered to be, in a limited way, like a field, such as a gravitational field. They are invisible but operate in a way that attracts or binds.

Figure 5. Relation of Common Origin.

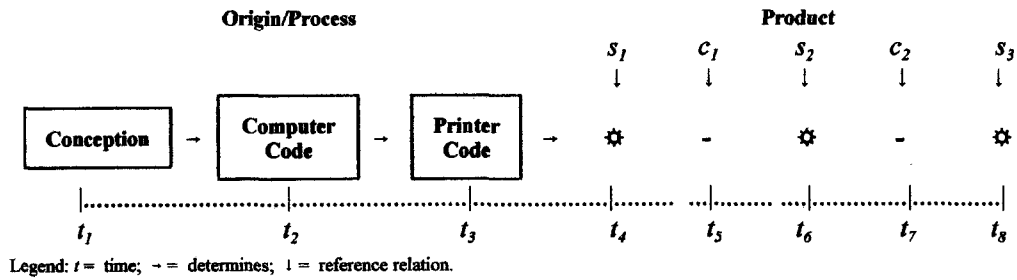


Figure 6. Characterization of a Factual System that Corresponds to Definition 2.

Verbal Definitions of Abstracted Percepts	$S(s)$ = _{ar} a system of sun shaped objects connected by dashes that were generated by a human through a human constructed computer. $S(s)_1$ = _{ar} the system of sun shaped objects and dashes that occupies the left position within the wavy medium below. $S(s)_2$ = _{ar} the system of sun shaped objects and dashes that occupies the right position within the wavy medium below.
Designation	$S(s)_1$ $S(s)_2$ ↓ ↓
Abstraction of Percepts (representation)	$\odot-\odot-\odot$ $\odot-\odot-\odot$ ↓ ↓
Percept of Factual System (representation)	
Factual Systems	

Table 24. Relation Definition 2: A property that holds between an ordered pair of objects (as one expressed by 'is equal to', 'is less than', or 'is the brother of').

	1st Relatum	Relations	2nd Relatum
Definition	property of object x_1	1. holds between 2. is equal to 2. is less than 2. is the brother of	property of object x_2
Statement	The number of objects in system $S(s)_1$...	... is equal to...	... the number of objects in system $S(s)_2$
	1st Relatum Term	Relational Term	2nd Relatum Term
	$S(s)_1$	equality	$S(s)_2$
	1st Relatum Percept * (representation)	Relational Percept	2nd Relatum Percept (representation)
	$\odot-\odot-\odot$	(none relative to assertion)	$\odot-\odot-\odot$
	1st Relatum Fact (representation)	Factual Relation/Connector	2nd Relatum Fact (representation)
	$\odot-\odot-\odot$	(none relative to assertion)	$\odot-\odot-\odot$

Table 25. Relational and Relevance Statements based on M-W's Definition of 'Relation'.

Def	Relational Statement	Relevance Statement
1a:	• Object s_1 is connected by dash c_1 to object s_2 .	• Object s_1 is relevant to object s_2 .
1b:	• Object s_1 , within system $S(s)$ and constructed to remain together as assembled, belongs together with object s_2 .	• Object s_1 is relevant to object s_2 .
1c:	• Parts collection 1 is connected by bolts to parts collection 2. • Parts collection 1 works together with parts collection 2.	• Collection 1 is relevant to collection 2.
1d:	• Object s_1 is the same kind as object s_2 . • Object s_1 is a circular object with a perimeter divided into 8 equal segments by 8 short lines and these same parts are possessed by object s_2 .	• Object s_1 is relevant to object s_2 .
2:	• The number of objects in system $S(s)_1$ is equal to the number of objects in system $S(s)_2$.	• System $S(s)_1$ is relevant to system $S(s)_2$.

Legend: $s = \star$

The Meaning of 'Relevance' Based on the Definition of 'Relation'. To conclude this subsection, we need to construct relational statements based on Merriam-Webster's definition of 'relation' and examine them (Table 25). For example, using the symbols from the previous Figures and Tables, the statement 'Object s_1 is connected by dash c_1 to object s_2 ' would be converted to 'Object s_1 is relevant to object s_2 .' This and the other relevance statements in Table 25 do not sound right, at least to me. But such an intuition provides no reason to end the analysis. Concerning 1a, why an object like a ' \star ' is relevant to another such object just because it is related or connected to it by a dash is not apparent. The same question can be asked in relation to statements based on Definitions 1c, 1d, and 2, which concern the working relations of parts within a starter motor, sameness of kind, and equality, respectively. Concerning 1b, when we ask why one ' \star ' belongs together with another ' \star ', it is clear that they belong together because I constructed them to meet a particular purpose. This suggests that relations between such abiotic objects, which are non-significant in themselves, are not relevant to each other just because they are associated. Rather, their association is relevant to an object of significance through acts relevant, for example, to a purpose. Similarly, the statements related to Definitions 1a, 1c, 1d, and 2 could be altered to connect them to a purpose, problem statement, or question such as what is the nature of $S(s)$, what are the similarities/differences between $S(s)_1$ and $S(s)_2$, and why does the engine of my car turn over? The central problem here concerns the relations between the classes 'relevance' and 'relation'; specifically, whether they overlap partially or completely. The relation between these two terms will be discussed at length in Section 6.1.

4.5 Summary and Conclusion

Dictionaries provide a crucial source of data to answer the historical question concerning the meaning of 'relevance.' Because they provide both definitions and a sample of historical statements and define all terms, dictionaries allow a rigorous semantic analysis that cannot be completed through other sources. Despite their advantages, dictionaries create a number of obstacles. Their definitions of 'relevance' terms are unsystematic, imprecise, and variable. Hence, definitional activity from a variety of disciplines has flourished over the last 50 years. Overcoming these problems requires collecting, analysing, and evaluating both definitions and statements. Further, referent systems should be modelled, which requires examining at least two sets of relational terms and a set of relational terms. Such referents include factual or conceptual objects and comparative or non-comparative relations, respectively. Various combinations of factual and conceptual objects and different relations of various directions are possible. By examining a variety of statements and definitions in these respects, the basic concept of relevance can be identified. Such a concept is the most general characterization of all relevance definitions and statements.

Given my analysis and evaluation of definitions sampled from dictionaries of Old Scots and English, the basic concept predominantly assigned to 'relevance' terms has been 'relation of significance'. Although the examples largely concern humans or objects significant to humans, I suggest that significance is a function of an organism. (See Sections 6.14 and 7.3.) Extending the analysis and evaluation to ancient Greek and Latin terms reveals a similar pattern of usage and the same basic concept. However, some dictionary definitions are not definite in designating the basic concept and their expressions open the door to relevance being any relation. This is an important issue to resolve because it determines the class of objects to which a general theory of relevance would refer and from which evidence would be obtained. That is, as one delimits relevance differently, the general theory of relevance must change. So, the stability and utility of a general theory of relevance depend on the stability and precision of its generic definition. Nonetheless, any term can be assigned different meanings, as codes, stipulations, and ironic use of terms indicate. This means that we do not necessarily need to follow previous conventions. However, I suggest that historical convention can have a role to play particularly if a term is solidly grounded in a language, has a predominant sense, and suits communication purposes. In any event, we must decide which definition best suits our purposes and helps solve related problems. These issues and tests will be further addressed in the remaining sections of my thesis.

5.0 Analysis and Evaluation of Generic and Specific Definitions of 'Relevance'

Both Mario Bunge (1974, 2003) and David Hitchcock (1992) have developed generic conceptions of relevance (as expressed by a generic definition) and divided relevance into types. By 'generic', I mean the most general sense of a concept that includes all types and instances of that concept. Because a generic definition must be representative of all types and instances, it is similar to a factual generalization or biological class. My purpose in this chapter is to outline both accounts in detail, expand upon them, suggest revisions, identify issues that need more extensive treatment, and contrast Bunge's with Hitchcock's account. In Chapter 7, I will summarize the main findings and integrate them with others from previous chapters.

5.1 Bunge's Generic Definition of 'Relevance'

Bunge's (1974; 2003) defines a generic sense of relevance as follows:

- (B_1) Relevance is a relation and its relata can be either constructs or facts (1974: 75).
- (B_2) Object A is relevant to object B if A makes some difference to B, or B depends on A. Relevance relates facts, constructs, or constructs and facts. Examples: Biology is conceptually relevant to psychology (C-C); the economy is factually relevant to politics (F-F); light is referentially relevant to optics (F-C); economic theory ought to be pragmatically relevant to business (C-F) (2003: 249).

The two definitions express essentially the same basic concept. In Bunge (1974), he expands on B_1 by defining the same types of relevance relations as included in B_2 . Central to these definitions is the distinction between constructs and facts, which for Bunge are mental representations (concepts and propositions) and all other objects, respectively. He makes the distinction because the two types of objects are as fundamentally different as a copy and original are. The distinction is both ontological and epistemic because it concerns the nature of objects where the representational object is a means of knowing and the fact is the object known.

Two minor differences occur between the two definitions. First, Bunge uses the term 'relation' in B_1 , whereas in B_2 he uses the slightly more specific relational terms 'makes some difference' and 'depends on'. Whether these two sets of relations completely overlap or not is not entirely clear. However, I have not undertaken the lengthy analysis that would be required to sort out their relations. Second, Bunge uses 'relation' in B_1 and 'relates' in B_2 . I suggest B_2 should be revised to avoid implying the potentially misleading active sense of 'relates'. The wording is significant because 'relevance', in the sense used, refers to a conceptual object and Bunge (1977)

maintains that only physical things have causal efficacy. Based on the analyses presented in Chapter 4, I suggest that the role of the term 'relevance' is not to *relate* objects but to *indicate* a relation, which gives it primarily a referential role and necessitates inclusion of cognitive process into its conception. Accordingly, I suggest revising Bunge's definition to read: 'Relevance assertions indicate relations between facts, constructs, or constructs and facts.'

5.2 Bunge's Specific Definitions of 'Relevance'

Bunge (1974; 75) divides 'relevance' into six main types, which correspond to various combinations of fact/concept relations. Further, he defines each type systematically, begins with the most basic definitions, and provides examples for some types. The following subsections present his definitions and examples, which are tabulated so that their structure and composition are clearly depicted. However, absent from Bunge's account are detailed models/analyses of the examples and explanations why the examples are relevance relations. This weakens his account because we need to work from the ground up to build a general theory that adequately represents relevance relations and we cannot do that when the relations between objects are not evident. Analogously, we could be told that a compound is composed entirely of carbon. However, without knowing the nature of relations between the atoms, which reveal connections and structure, we cannot tell if the compound is graphite, coal, or diamond. Further, any theory of such a compound would be incomplete. Finally, if we accept that relevance is best defined as a relation of significance, this notion will have to be worked into Bunge's account. Accordingly, I have done so and offered revisions to the account.

Bunge distinguishes between two kinds of conceptual relevance: formal/syntactical and semantical.

Formal or Syntactical Relevance: Construct c is syntactically relevant to construct c' iff there is a context in which c is logically related to c' so that c determines c' at least in part. (76.2)

- In a definition, the definiens is syntactically relevant to the definiendum.
- In an argument, the premises are syntactically relevant to the conclusions.
- In a function, the independent variables are syntactically relevant to the dependent variables.

Examples of Syntactical Relevance

Context	1 st Relatum	Relation	2 nd Relatum
	<i>c</i>	<ul style="list-style-type: none"> • logical • determination • relevance 	<i>c'</i>
Definition	Definiens	R_{\rightarrow}	Definiendum
Argument	Premises	R_{\rightarrow}	Conclusions
Function*	Independent Variable	R_{\rightarrow}	Dependent Variable
(Factual Research)	Pure Mathematics	R_{\rightarrow}	Science
Solid State Theory	Metal	R_{\rightarrow}	Conductor
Syntactic Irrelevance			
Ornithology	Raven	R_{\rightarrow}	Black

* When functions have an inverse, the relevance is mutual. () contains an assumed object.

Bunge does not explain any of his examples and, despite numerous attempts, I am unable to work out a number of issues that arise. Doing so requires (i) working through his account of semantics, which is quite difficult, labourious, and time consuming, (ii) determining what he means by ‘logical’, ‘formal’, and ‘syntactical’, and (iii) determining what he has in mind with the relations mentioned and their relations. To illustrate, I will identify three issues that concern the relevance of a definiens to a definiendum. First, when Bunge mentions a construct like ‘definiendum’, is he referring just to the concept of definiendum, or any concept that is designated by a term functioning as a definiendum, or both? Second, when constructing a new term, a cognitive act of designation determines the term’s referent and from familiarity with that referent we are able to construct a definition. Further, continued acts accepting and communicating the initial designation and/or definition or acts of inscribing plus the endurance of that inscription maintain the designation and/or definition. So, one construct does not determine the other but rather various acts and factual conditions determine them and their relations. Third, a definiendum (term) must be conceptually equivalent to the definiens (terms of the definition), as the bidirectional relational term ‘iff’ attests. So, how does a term determine other terms equivalent to it or, where $A=A$, how does A determine A? We also need to work through the other examples of syntactic relevance, ask similar questions, and develop detailed models of the various systems involved in a relevance statement.

Semantical Relevance: Construct *c* is semantically relevant to construct *c'* iff (i) *c* is syntactically relevant to *c'* and (ii) *c* and *c'* share referents (\mathfrak{R}); i.e., $\mathfrak{R}(c) \cap \mathfrak{R}(c') \neq \emptyset$. (76.3)

- The specific gravity function is relevant to the weight function.

- Let c concern a gene in an organism and c' a molar or phenotypical trait of the same organism. Then c will be semantically relevant to c' just in case genetics happens to contain a law according to which c determines c' at least in part.

- The biological variables are irrelevant to the psychological ones in the context of behaviorism.

Examples of Semantical Relevance

Context	$\mathfrak{R}(c)$	\cap	$\mathfrak{R}(c')$	Presumption
Physics	Specific gravity function	R_{\rightarrow}	Weight function	
Genetics	Organismic gene	R_{\rightarrow}	Phenotypic trait	A gene is lawfully related to a trait.
Solid State Theory	Metal	R_{\rightarrow}	Conductor	

Bunge does not explain how these examples are semantically relevant, which just increases the puzzlement, at least for me. Also, if we accept relevance as a relation of significance, the issue to resolve is whether or not a semantic relation is derivatively a relation of significance, as was discussed with an example in the *Cambridge Dictionary* concerning a leaflet and an information need (Table 18). For it to be a relation of significance, the direction of the relevance relation must be to a concept that derives its relevance from an object of significance, which would be a human. However, an explanation would be required to show how that would occur. A simplified model would be: $(c \xrightarrow{R} c') \xrightarrow{R} Context$. Otherwise, a semantic relation of non-significance between two objects could be relevant to a problem; i.e., $(c \xrightarrow{S} c') \xrightarrow{R} Context/Problem$. Specifically, the issue is whether or not the concept 'gene' is relevant to the concept 'phenotypic trait' within the context of genetics or whether the two concepts are semantically related and relevant/significant to a problem in genetics. In any case, Bunge's definition clearly shows that semantic relations are a function of referent relations.

Bunge develops a general notion of referential relevance and the following examples.

Referential Relevance - General Concept: A construct c is said to be referentially relevant to a fact (thing, state, event, process) f iff f is in the reference class of c , i.e. if $f \in \mathfrak{R}(c)$.

- Pure mathematics is syntactically relevant to science, which is in turn referentially relevant to reality.
- According to the Copenhagen interpretation of the quantum theories, the latter are relevant to the human mind, while according to the realist interpretation they are not.
- The concept of thinking (or ideation) is referentially relevant to neural activity.

Examples of Referential Relevance

Context	<i>c</i>	$Rf \rightarrow$	<i>f</i>
(Factual Research)	Science	$Rf \rightarrow$	Reality
(Psychology)	Thinking/Ideation	$Rf \rightarrow$	Neural Activity
Copenhagen Interpretation of Quantum Theory	Quantum Theories	$Rf \rightarrow$	Human Mind
Realist Interpretation	Quantum Theories	$Rf \rightarrow$	Human Mind

() contains an assumed object.

Bunge defines 'referential relevance' in terms of a construct (concept/concept system) being relevant to a fact, provided that the fact is a member of the construct's reference class. Again, the issue to examine is whether or not the referential relation is a relation of significance. Key to this issue is the direction of the relation, which Bunge indicates is $c \xrightarrow{Rf} f$. In other words, his claim is that a construct is relevant or connected/significant to a fact. Specifically, he claims that science is relevant to reality because science refers to reality. In contrast, by conceiving of relevance as a relation of significance, reality would be relevant to science because science is an activity of humans and reality is the object of scientific study. Similarly, Bunge (2003), by way of the definition in his dictionary, would claim that science makes a difference to reality or reality depends on science. Certainly, reality does not depend on science but whether and how science makes a difference to reality must be ascertained. Here we are hindered because Bunge does not define 'makes a difference'. Some of his examples of referential relevance might contain a second term whose referent is derivatively significant. For example, Bunge claims that the concept of thinking/ideation is relevant to neural activity. No doubt, the concept of thinking/ideation refers to the fact of neural activity and, hence, is connected by way of designation, which occurs by way of a cognitive act. But why is such a conceptual object significant to neural activity itself? What significance does neural activity have in itself that determines whether the concept is relevant to it? I suggest that, in the context of the example, (i) it either has no significance in itself, which means referential relations are not relations of significance or (ii) it is derivatively significant, which means referential relations are derivatively relations of significance. Otherwise, the connection established between a construct and a fact through a cognitive act of designation is significant to a cognitive goal of a significant object, like a human. That is, $(c \xrightarrow{Rf} f) \xrightarrow{Rf} G$, where *G* is a human being's goal. Conceived as such, the structure of a relevance statement is similar to that outlined by Hitchcock (1992), as discussed in the next section. However, unlike Hitchcock, I prefer the concept

of system to situation, emphasise that the first relatum can be a system of varying complexity, and advocate detailed analysis/evaluation to model relations and separate significance from non-significance relations.

Bunge's definition and examples of 'evidential relevance' are as follows:

Evidential Relevance: An empirical fact e is evidentially relevant to a construct c iff there is another construct c' such that (i) c' is syntactically relevant to c and (ii) c' is referentially relevant to e .

- The conceptual basis of the common lie detector is the hypothesis that increase in hand sweating is an index of lying.
- Dreams are (so far) irrelevant to the study of personality because there is no scientific theory in which dream contents and personality traits are related.
- Prior to the theory of evolution the differences among species were not normally regarded as pointing to (or against) the hypothesis of evolution.

Examples of Evidential Relevance

Context	c	$R_{f \rightarrow}$	e
(Law/Psychology)	Hypothesis that increase in hand sweating is an index of lying	\leftarrow^E $R_{f \rightarrow}$	Lie detector results
Absence of scientific theory linking dreams to personality	Study of personality	\leftarrow^E $R_{f \rightarrow}$	Dreams*
Prior to evolutionary theory	Hypothesis of evolution	\leftarrow^E $R_{f \rightarrow}$	Differences among species **

* Not as of date of publication. ** Not normally regarded as relevant at that time.

Bunge's examples are presented in written form and are not structured to indicate clearly which elements of the statements correspond to c and c' . For example, he writes, "The conceptual basis of the common lie detector is the hypothesis that increase in hand sweating is an index of lying" (77.6). Despite the precise definition, the examples are vague, which leaves us with little to develop a theory of relevance.

Bunge (1974; 76.1) provides only a definition of 'pragmatic relevance'.

Pragmatic Relevance: ...a construct may be regarded as being pragmatically relevant to an action iff the former is part of a view or theory that is instrumental in bringing forth or preventing the given action.

Of importance here is the direction of the relation, which is $c \xrightarrow{R} f$, where $c \subseteq T$ and $T^d \rightarrow f$.

Bunge (1974) does not provide any examples but he does in his dictionary (2003: 249), where he

writes “economic theory ought to be pragmatically relevant to business”. This is a very general statement and analysing it helps to understand the relevance relations asserted. Business is a goal, problem, and activity of human beings. The former two are conceptual objects but the latter is a factual object/process. So, the pragmatic relevance relation is between economic theory and humans engaged in business activity ($c \xrightarrow{R} f$), both of which are objects of significance given that they are human constructs. Also of importance to Bunge’s definition is that pragmatic relevance requires completion of an act. So, his conception excludes contemplation of means and ends relations, where ends are not acts themselves but representations of future acts or states. Again, we need to inventory such relational statements and model the referent systems to arrive at a representative definition of pragmatic relevance.

Bunge (1974) provides only a definition of ‘factual relevance’.

Factual Relevance...a fact may be relevant to another fact iff the former makes some difference to the latter (1974: 76.1) or the latter depends on the former (2003: 249).

Even though Bunge (2003) cites the example of the economy being factually relevant to politics, which concerns relations of significance, the above definition opens the possibility of any fact being relevant to any other fact. This issue will be addressed specifically in Section 6.1.

5.3 Hitchcock’s Generic Definition of ‘Relevance’

Hitchcock (1992) also outlines a generic sense of ‘relevance’. He distinguishes between relevance relations that are dyadic and triadic and formulates a definition only for the latter. I will focus largely on this definition, as follows, but will also discuss his account of dyadic relations.

Relevance is a triadic relation between an item, an outcome or goal, and a situation (251.1)

He explains that he prefers the term ‘situation’ over ‘context’ because the latter is often associated with text, whereas ‘situation’ concerns “the complex of antecedent and contemporary circumstances in which the item which is relevant or irrelevant and the item to which it is relevant or irrelevant occur”(266.4). As this statement is formulated, a situation does not necessarily play a determinant role. He explains further that not all antecedent conditions “make a difference” to the relevance of one item to another and that a person “will specify a situation by mentioning only its features which do make a difference to the relevance relation between the items under discussion” (266.4). As formulated, the situation comprises all antecedent conditions but the situation specified

for a relevance statement comprises only those conditions that make a difference. The latter requires a judgment to determine the relevance of those conditions to the two relata. Hitchcock then maintains that we should generally treat relevance as a triadic relation and explains how:

"...we should treat relevance generally as a triadic relation, whose third term is the situation in which the first term is relevant to the second term, and acknowledge that there will be values of the first two terms for which the value of the third term makes no difference to whether the first is relevant to the second. For example: the fact that ice cream was invented in Italy is irrelevant to proving the Pythagorean theorem, regardless of the situation in which someone is attempting the proof. (252.1)

I suggest that this recommendation is problematic. First, 'situation' is defined ambiguously. In the recommendation, the sense employed is that of 'the complex antecedent and contemporary circumstances', where no condition is determinant. However, the recommendation applies to the formulation of a relevance statement and it breaks the rule that requires specifying only determinant conditions. Second, if no antecedent condition has a determinant role, then no such condition is relevant to a dyadic relation. Accordingly, how and why would anyone bother to identify irrelevant conditions? Imposing this requirement would unnecessarily complicate the modelling of referent systems. Third, treating a dyadic relation as a triadic relation with non-determinant/irrelevant antecedent conditions does not make any sense in the context of developing a theory of relevance because it is an exercise of irrelevance with the appearance of being relevant. Also, we ought to be sure to inventory dyadic relations and analyse and describe them as they are, provided we want to develop a representative general theory of relevance. Fourth, despite the recommendation, Hitchcock outlines two examples that he offers as dyadic relevance relations:

(i) "...the size of the population from which a sample has been (quasi-randomly) selected is...relevant to determining whether sampling without replacement introduces substantial bias into the selection method"

(ii) "...student demands in the 1960's for 'relevant courses' were indeterminate, since they did not specify what the courses should be relevant to" (251.4).

However, the first example is a case of a triadic relation where population size is relevant to the determination of bias within the situation of a quasi-random selection process. The second example might also be a case of a triadic relation if the claim was 'courses ought to be relevant to y within the situation of university education or some programs within universities' as opposed to college or professional programs. So, what we need to do is inventory relevance relations that are considered to be dyadic, where any inventory is determined by the definition of 'relevance'. That is, where

delimitations vary between definitions so would reference classes and inventoried instances. With any such inventory, we then need to analyse instances and model the referent systems to determine if the statements actually represent dyadic relations.

5.4 Hitchcock's Specific Definitions of 'Relevance'

Hitchcock identifies two types of 2nd relata (outcome and goal) that correspond to two main types of relevance (causal and epistemic). He defines 'causal relevance' as follows:

(CR) "...something is relevant to an outcome in a given situation if it helps to cause that outcome in the situation, irrelevant if it is of no help" (253.4).

Here, 'relevance' is associated with the relational term 'helps', which is similar to Bunge's term 'makes a difference'. However, Hitchcock allows that propositions or their expression cause beliefs (254.2f), whereas Bunge holds that they are employed within cognitive processes that formulate beliefs (2001; 79). Hitchcock provides but does not discuss two examples that concern causal relevance. Unfortunately, they are both examples of irrelevance so the nature of relevance relations cannot be shown directly. The examples are of (i) salt change in a diet being likely irrelevant to reducing blood pressure for people with normal salt metabolism and (ii) intellectuals not being a relevant factor in the Polish government's decision to experiment with a negotiation process after a strike on Aug 14 (253.4). Hitchcock does not model these examples or identify which elements correspond to the situation or the two terms. Figure 7 provides this information to assist in understanding the relations involved. I discuss them in detail because they provide useful information about relevance.

The first example concerns (i) three factual parameters: salt intake, salt metabolism, and blood pressure and (ii) a comparison between at least three situations (three salt intake regimes for at least one person who normally metabolizes salt), despite the apparent wording and grammatical structure of the example, which, again, attests to the importance of getting beyond expression or linguistic structure to explore the system of referents that the expression represents. Three trials are needed to account for the possibility that the baseline conditions might already be at the threshold of influence on blood pressure, which would yield a 'no influence' result when salt intake is increased. The following provides three models of the experiment to represent the three situations identified above and a general/non-specific model of the experiment. Where '→' represents a break in a series of events and the word groupings name cumulative stages of the series:

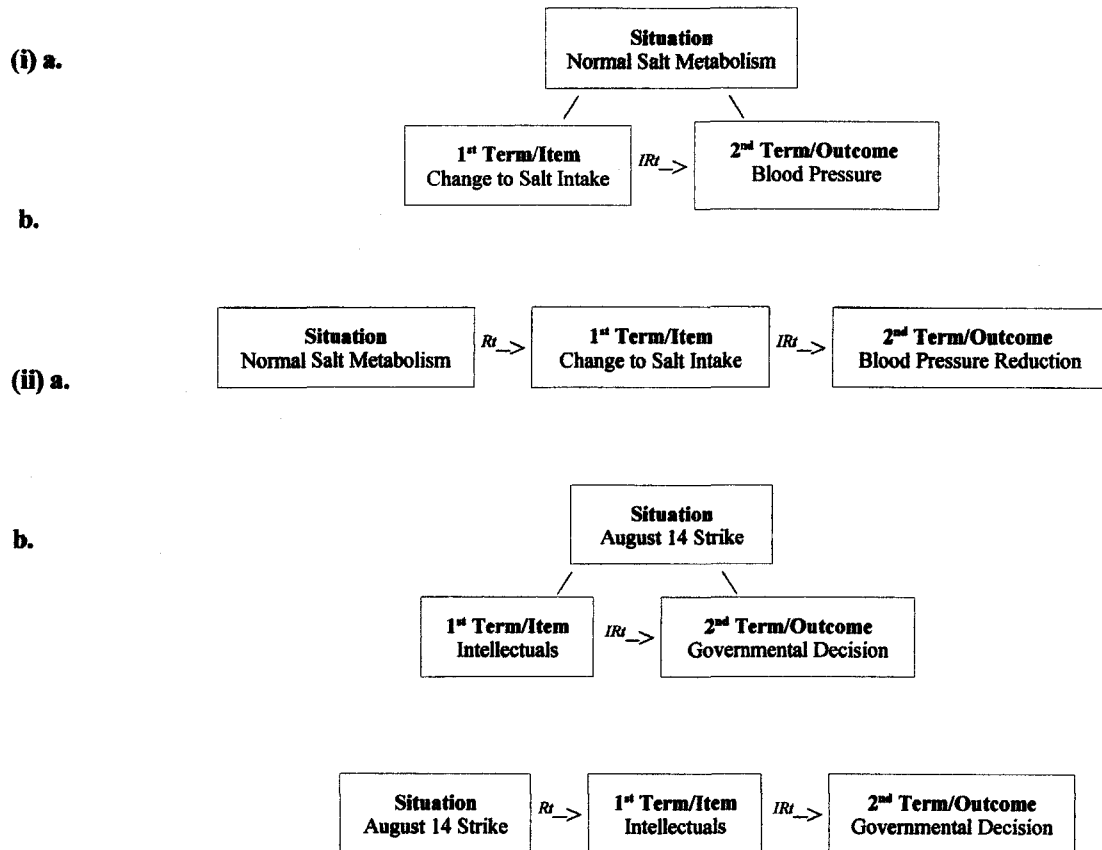
S_1 : Salt Intake Level 1 (Baseline) \rightarrow Normal Metabolism of Person p_1 \rightarrow Blood Pressure Value $P(b)$.
 S_2 : Salt Intake Level 2 (Increase) \rightarrow Normal Metabolism of Person p_1 \rightarrow Blood Pressure Value $P(b)$.
 S_3 : Salt Intake Level 3 (Decrease) \rightarrow Normal Metabolism of Person p_1 \rightarrow Blood Pressure Value $P(b)$.
 S_n : Salt Intake Level l \rightarrow Metabolism m of Person p_n \rightarrow Blood Pressure Value $P(b)$.

This description of the actual occurrence of the event, which is a model of the referent system, is at variance with the model of the relevance relation as structured by a linguistic expression within the context of a particular conception of relevance, as shown in Figure 7. Again, relevance relations ought to be modelled on the basis of referent systems, which is what the linguistic expression has been constructed to represent. Further, assuming the factual correctness of the claim about salt intake, the following relevance statements can be constructed:

1. Changing salt intake is *irrelevant* to medical interventions aimed at reducing blood pressure in a person who normally metabolizes salt because salt intake has no effect on the blood pressure of such a person.
2. Changing salt intake is *relevant* to medical interventions aimed at reducing blood pressure in a person who abnormally metabolizes salt because salt intake affects the blood pressure of such a person.

These statements also show the structure of a well-formed relevance formula. It includes the specification of relevance relations and the system of referents that determines and justifies the relevance assertion. Without the latter, the understanding and evaluation of relevance terminates in either intuition, which is unrevealing, or an unanswered 'why' question in response to the relevance claim. More specifically, if salt intake increases blood pressure, then salt intake is a possible medical intervention and is relevant to the goal of reducing blood pressure, which is connected to an individual's goal of maintaining health. The frames of relevance operate in the reverse order. Further, multiple and hierarchic frames of relevance can operate in a given case (e.g., land-use or technological plans based on multiple goals, objectives, prescriptions, etc.), which again attests to the importance of system in understanding, modelling, and evaluating relevance statements. In contrast, Hitchcock understands the example to be purely a case of causal relevance where the outcome is a fact, which Bunge calls factual relevance. Even if the case were purely factual, it is not clear why the relation of salt intake would be relevant to blood pressure given abnormal metabolism. It is clear that high blood pressure is linked to health status and both are of concern to human individuals. If a relevance statement did not contain such a concern, any factual

Figure 7. Models of Hitchcock's Examples of Causal Relevance.



association, such as the association of NaCl in distilled water, would be a relevance relation. Again, this issue will be explored in detail in Section 6.1.

The second example concerns the lack of influence of intellectuals on governmental decisions after a strike (Fig. 7 ii). A strike is a social occurrence that creates (i) a social change, which includes factual relations involving beings of significance, and (ii) a demand for further, future change, which is a complex of conceptual relations and the possibility of future factual relations. Apparently, the Polish government needed to respond to the strike (both facts) but did not consider ‘input’ from intellectuals either because no information was provided or it was ruled out as irrelevant. ‘Input’ and ‘information’ are synonyms that refer to conceptual objects. The example actually involves other objects, and their relations are more complex than Hitchcock indicates and Figure 7 shows. The initial frame of relevance is created by the strike, which is a complex of factual and conceptual relations created by human individuals. Essentially, the strike is a plea of

relevance - a raising up of concerns that individuals consider to be worthy of governmental attention. Additionally, the strike is observed by the government. By such an act, they establish an evidential relation between the strike and their potential decisions. Also, the government interprets the information, which creates a further frame of relevance and a complex of conceptual relations. Finally, the government decides on the basis of the selected information and the act of negotiation is initiated, which is a complex of conceptual and factual relations of pragmatic relevance. Now, the strike is relevant to the act of negotiation because the strike helped to cause the government's action (conceived as factual relations of non-significance) because Hitchcock defined relevance that way. Given such a conception, an avalanche would be relevant to a boulder when it transports the boulder from its location on an upper slope to the valley bottom. In contrast, conceiving relevance as a relation of significance, as I recommend, the strike is an act of a being of significance and it is noticed, interpreted, and acted upon by other such beings.

The second main type of relevance relation that Hitchcock identifies is epistemic relevance:

(ER) An item of information *x* is relevant to an epistemic goal *y* in a given situation if and only if in that situation *x* can be put together with other pieces of at least potentially accurate information to arrive at the epistemic goal, provided that the other pieces of information are not sufficient by themselves to achieve the epistemic goal if the original information is inaccurate. (257.4)

He explains that, when the goal is knowledge, reasonable belief, or reasonable behaviour, a statement may help to cause acceptance or settlement but it may not be or ought not to be of logical or justificatory help in the acceptance or settlement of the issue (253.6; 254.1). He also notes that such a relevance judgment requires criteria (254.2). In positive terms, he indicates that an epistemically relevant item makes a contribution to an epistemic goal, when that item is recognized (254.3f). In support of this point, Hitchcock provides an example from a Sherlock Holmes' novel where a dog in a stable did not bark when a horse, Silver Blaze, was stolen during the night. Hitchcock explains that this fact is both causally and epistemically relevant to Holmes' goal of discovering who stole the horse. But the fact had no effect on the inspector until Holmes pointed out its relevance (254.3f).

Generalizing, Hitchcock indicates that the first or subject term of a relevance statement is a piece of information such as a proposition (the dog did not bark), a propositional function (whether or not the dog barked), or a speech act communicating or requesting information (256.1). A piece of information is conceptual, as are propositions and propositional functions. But a speech *act* is neither informational nor conceptual. For non-informational objects, he maintains that "we leave

the relation of relevance undefined; it simply makes no sense to ask whether Dr. Watson (or London, or 1890) is relevant to determining who stole Silver Blaze” (256.1). Perhaps Dr. Watson could not have stolen the horse and certainly a city or a date has no active agency to steal. But factual objects must be taken into consideration in modelling epistemic relevance, even if epistemic relevance involves judgments and is limited to conceptual relations. First, Hitchcock uses (factual) propositions in his examples (state of a dog), and propositions are representations of factual objects. Second, without modelling referential and evidential relations and referent relations, the account of epistemic relevance would be incomplete.

Hitchcock also discusses the second term of a relevance statement, which is an epistemic goal: an issue to be settled, a question to be answered, a problem to be solved, or a decision to be made. He maintains that such a goal is epistemic, not causal, because a person can combine it ineliminably with other information in a thought process to arrive at the goal. Further, he indicates that an epistemic goal is always the goal of a particular individual or group of individuals on a particular occasion (256.2f). However, he does not consider a person or group to be a fourth term (257.1) because mere difference of individuals are irrelevant to the presence or absence of a relevance relation and the differences between individuals can be represented by the situation (256.3). This account, then, is limited to conceptual relations and it rules out occurrences of ‘stimulus relevance’ studied by psychologists (e.g., Tchakaroff and Haralanov 1996). As such, his overall account does not provide a representative *general* theory of relevance.

5.5 Summary and Conclusion

Bunge provides a generic definition of ‘relevance’, systematically identifies types of relevance relations, and provides precise definitions of the types. He does so in an ontologically and epistemically significant way by distinguishing between factual and conceptual objects and the kinds of relations that occur between them. However, of equal ontological and epistemic significance, but omitted from Bunge’s account, are mental objects such as memories, perceptions, and imaginations. To illustrate some of his definitions, Bunge lists examples through very brief statements but he does not explain why and how they are relevance relations, show how they fit his definitions, or model the referent systems to which the relevance statements correspond. Rather, he appeals to our intuitions, expects we have the knowledge to readily understand his examples, gives us a lot of work to determine why and how the examples are relevance relations, or leaves us in

obscurity. Further, his generic definition leaves open the possibility that a relevance relation is any relation, which would make his account of relevance inadequate because it deals only generally with kinds of relations when we need a more specific identification and description of types. Additionally, some specific definitions include relations between factual objects of non-significance, whereas relevance has historically and largely delimited relations that involve objects of significance. If the definition of 'relevance' as a relation of significance were to be accepted, Bunge's account would need to be re-conceived. Specifically, some of the definitions he provides would need to be revised, some examples modelled differently, and some examples omitted. Whatever its limitations, Bunge provides a useful framework to analyse relevance relations by distinguishing between mental representational objects (like concepts) and factual objects (like things). Further, his account is situated within a greater conceptual system. As such, it permits a greater understanding of relevance, as does a biological taxonomy in understanding a particular organism.

Hitchcock defines a generic concept of relevance and two main types: causal and epistemic. His generic definition is structural in that it identifies four elements: two items, a situation, and a non-specified relation between the two items and the situation. He identifies two "main" types but his classification is not systematic in that it is not based on an inventory, description, and classification of a representative sample of relevance statements. His causal notion of relevance involves any factual relation and, therefore, includes relations of non-significance. His epistemic notion of relevance is defined in a way that excludes referent systems and makes his account purely conceptual, even though he uses factual examples to illustrate the notion, for which referential/evidential relations must be included, and his notion of situation refers to factual systems. Further, he outlines the structure of a relevance statement, which can express either a dyadic or triadic relation. A dyadic relation is composed of two associated objects, whereas a triadic relation is composed of two associated objects that occur within a situation. However, he defines relevance only in terms of triadic relations. Also, he ambiguously defines 'situation' to include either determinant or non-determinant elements and from this he makes a problematic recommendation to treat relevance generally as a triadic relation, which would introduce irrelevant considerations into models of dyadic relevance relations and contravene a rule he makes about specifying a situation only in terms of determinant factors. The recommendation is also made without first determining the incidence and relative importance of dyadic relations.

Hitchcock provides numerous examples but, like Bunge's, they conform to the definition because they are constructed by him to do so or they have been constructed by others and happen to correspond to the definition. Constructing an example to fit a definition runs the risk of circularity in that it amounts to 'relevance is x ' because I say 'relevance is x '. Nonetheless, conformity shows that such definitions can generate instances of the conception's future use because the example is an instance of future use. Finding a previously constructed conforming example gives an indication that the definition fits some previous instances of the concept's use. However, a few conforming examples is insufficient to develop a generalization about a generic concept. Such examples provide information only about that particular set of examples, whereas a generic concept must represent all previous instances of the concept's use, which is why the question 'What is relevance?' is a historical question and lexicographers describe rather than prescribe when they construct definitions. Analogously, an archeologist finding a fossilized femur might be able to determine that it is an instance of a particular genus of dinosaur and can describe details about that particular bone but can say nothing else about the entire individual or species. As mentioned in Section 3.3, answering the historical question introduces difficult sampling issues. Hitchcock's examples are also problematic because they are not sufficiently detailed or modelled, a non-relation (irrelevance) is used in an attempt to elucidate a relation (relevance), and, upon analysis, some of his examples do not conform to the definition of which they are to be an instance. Without detailed modelling of both relevance statements and their corresponding referent systems and positive examples (relevance relations), we are left with intuitively appealing examples that provide an intuitive account of relevance. This works only insofar as our intuitions are correct. However, intuitions provide no public account of relevance and incorrect examples corrupt both our intuitions and accounts based on them.

Hitchcock discusses relevance under the heading of 'ontological status', whereas Bunge includes relevance in his account of semantics. However, neither discuss why they make such a placement. Additionally, both Bunge and Hitchcock say, without elaboration, that relevance *is* a relation rather than a particular kind of relation. Further, their definitions of types permits relevance relations to be relations of non-significance. The relation between the concepts of relevance and relation will be examined in greater detail in the next chapter. The main results of Chapter 5 will be integrated in Chapter 7.

6.0 Analysis and Evaluation of Issues

The analyses and evaluations of definitions, accounts, and statements in Chapters 4 and 5 have identified (i) elements that can be incorporated in a general theory of relevance (Chapter 7), (ii) elements that I suggest ought to be dismissed, (iii) obstacles that hinder the development of such a theory, and (iv) issues in need of resolution so that a general theory can be developed. Smaller issues were dealt with as they arose. However, the relation between the notions of relevance and relation is an issue that occurs in both dictionary definitions and generic accounts of relevance and requires extended treatment (Section 6.1). Corresponding issues include identifying the reference class and, hence, instances to be inventoried. Both need to be resolved prior to developing a general theory of relevance. In other words, a general theory of relevance is determined ultimately by the delimiting function of its definition. Change the definition and the reference class changes, a different inventory is required, and the general theory must be changed.

The analyses and evaluations of dictionary definitions in Chapter 4 suggest that relevance has largely delimited relations of significance. Conceiving of relevance as a relation of significance or recognizing that an important class of relevance relations are relations of significance might be useful in resolving the issue of whether relevance varies in degree. I discuss this issue in relation to strength and sufficiency of an argument (Section 6.2).

6.1 Relevance versus Relation

Although dictionaries define 'relevance' simply as a relation, the historical account of the concept and analysis of dictionary definitions and quotations in Chapter 4 suggest that the precise notion of relevance has been limited to relations of significance, which makes relevance a subcategory of relation. One exception is the 19th century notion of relevance as proportionality or correspondence. However, it is a distinct notion and would require a separate theory. In contrast to the notion of relevance as a relation of significance, both Bunge (1974) and Hitchcock (1992) say that relevance is a relation but neither elaborate on that statement despite its ambiguity. This issue has been touched upon in previous sections but I will examine it here in greater detail.

Asserting that relevance is a relation gives rise to two sets of interpretations. First, relevance could refer to the connection between relata (e.g., 'consumption' or '>'), rather than an individual relatum, or the entire system. Second, based on the meaning of 'is', either

(i) the concept of relevance is a subset of the class 'relation' ($Rv \subset Rn$) and relevance statements are translatable to relational statements but not all relational statements are translatable to relevance statements, or

(ii) the concepts of relevance (Rv) and relation (Rn) are equivalent ($Rv = Rn$), by which I mean they are synonyms and interchangeable, as sets they completely overlap, and any relevance statement is translatable to a relational statement and vice-versa.

Sorting out the overlap between 'relevance' and 'relation' has implications for Bunge's definition of factual relevance, which concerns any fact-fact relation, and for Hitchcock's definition of causal relevance, where "something is relevant to an outcome in a given situation if it helps cause that outcome in the situation" (253.5). We also need to consider whether or not the issue concerning overlap between 'relevance' and 'relation' is just a definitional concern that can be addressed by clarifying conceptual boundaries and consistently using the term, regardless of whatever overlap is assigned. Perhaps overlap is not really an issue and we just need to set down a clear and precise definition and use it consistently. However, making that decision must be addressed within the context of current/historic usage and the purpose that relevance, as either a relation of significance or any relation, serves or can serve.

6.1.1 Connection between Relata as the Referent of the Term 'Relevance'

Relevance statements are relational statements, which means that linguistic objects have been assembled by a cognitive agent to create a conventional form and represent a referent system composed of at least two associated objects. At a minimum, a relevance statement must contain at least three terms: a first relatum, a relational term, and a second relatum. Given that 'relevance' does not designate either of the relata, the issue is whether it designates just a connection, the referent system, or both. To address the issue, three types of systems and relations between them must be considered: term/sentence, concept/proposition, and referent. Although the term/sentence and concept/proposition systems reside in different locations, they have the same representational function in that they designate the same set of referents. So, in this context, they can be treated together. As defined in the introduction, I will use 'statement' to designate both.

Consider the following statements: (i) 'Snowshoe hares are relevant to red foxes' and (ii) 'Our research objective is to determine the relevance of snowshoe hares to red foxes.' As representations, 'relevant' and 'relevance' have several functions. First, they indicate a particular but non-specified relation or potential relation (e.g. consumption) between snowshoe hares (f_1) and red foxes (f_2) or a set of non-specified relations (e.g., pathogen transmission and consumption).

Second, given that the function of the suffix *-ance* is to indicate a state (Section 4.3.1) and given that the state cannot be the referent of just one relatum, ‘relevance’ must also refer to the whole system composed of the two associated objects. Third, the suffix *-ant* performs an adjectival function and it superficially appears to describe the first relatum. However, consider the following statement: ‘Snowshoe hares are relevant/transmit pathogens to red foxes.’ Given that ‘relevant’ indicates the concept and occurrence of pathogen transmission, if it has an adjectival function, it must be to describe the state of the predator-prey system by indicating or emphasizing one element of it, the relation. Fourth, both ‘relevance’ and ‘relevant’ indicate the direction of relation between two objects, which is from the first to the second relatum or $f_1 \xrightarrow{R} f_2$. In summary, both ‘relevance’ and ‘relevant’ are highly abstract terms that (i) designate both a non-specified relation or set of relations between at least two objects as well as the referent system and (ii) the direction of relation between at least two objects. As a whole, a relevance statement indicates a non-specified relation and can be replaced with a specific relational statement, which in turn refers to a conceptual or factual system. Whether or not relevance applies to any factual system is the issue explored next.

6.1.2 Overlap between the Concepts of Relevance and Relation

By previous acts of designation and acceptance, the term ‘relevance’ necessarily indicates a relation and all relevance statements are relational. However, this does not necessarily mean that the concepts of relevance and relation are equivalent ($R_v = R_n$) or that any relational statement can be translated to a relevance statement. Rather, we can only be sure at this point that relevance is at least a subcategory of relation ($R_v \subset R_n$). Determining whether or not the two notions are equivalent will help decide whether or not relevance is or ought to be limited to relations of significance, which has implications to the appropriate use of ‘relevance’, identification of relevance statements where the concept has been employed but not named, and identification of possible differences in the evaluation of relevance and other relational statements. If ‘relevance’ and ‘relation’ are equivalent, then (i) ‘ $8 > 2$ ’ is equivalent to ‘8 is relevant to 2’ and (ii) given the water molecule, ‘H is related to or associated with O’ is equivalent to ‘H is relevant to O’. Sorting out the relations between the two concepts requires identifying statements concerning relations of significance and statements concerning relations of non-significance; determining if any essential differences occur aside from significance; and, if so, deciding whether these differences actually make a difference.

6.1.3 Direction of Relations

Considering only binary relations, the possible directions can be: (a) $f_1 \rightarrow f_2$; (b) $f_1 \leftarrow f_2$; or (c) $f_1 \leftrightarrow f_2$, where f_n is any fact and the arrows designate the direction of the relation. (Conceptual objects could also be used.) For example, corresponding relations between snowshoe hares (f_1) and red foxes (f_2) include (a) nutrient transfer, which is a one way relation from hares to foxes, (b) killing, which is a one way relation from foxes to hares, and (c) habitat use or respective movements within a habitat, which is a reciprocal relation in that a fox partly determines where hares locate and move within their habitat and vice-versa (Table 26). In each example, the same problem can be approached through either description, questioning, and definition. To illustrate the first two ways of approaching the problem, I will examine the first example - consumption/nutrient transfer. Similar results can be obtained by analysing the other two examples.

First, the snowshoe hare makes a difference/is relevant to the fox because it is a food item for the fox. This relation involves the assimilation of material composing the hare by the fox for the fox's good. In other words, snowshoe hares make a difference to and are relevant to red foxes by supplying nutrients needed by the fox ($f_1^{Rr} \rightarrow f_2$). However, the fox's physiological and anatomical characteristics determine its nutritional needs, partly determine availability of food items, and these determine its acts of consumption, which include snowshoe hares. The direction of this relation is opposite to that of relevance ($f_2^d \rightarrow f_1$) and not included by the relevance assertion.

Second, when saying that hares are relevant to foxes, we can and need to ask why. The answer is that hares make a difference to foxes by being a source of nutrients ($f_1^{Rr} \rightarrow f_2$). Again, we can and need to ask why. The reason that hares make a difference to foxes is that foxes have a particular anatomy and physiology and they generate a need for and availability of particular kinds of food ($f_2^d \rightarrow f_1$). As with the description, this questioning demonstrates two different directions of relations. It also indicates logical priority: anatomy/physiology \rightarrow nutritional need/food availability \rightarrow relevant food items.

Third, if relevance and relation are equivalent, then neither is logically prior and both include the same types and directions of relations. However, if they are not the same, only two possibilities arise. They are either disjoint or they overlap, where the extent of overlap would be partial or entire. The sets cannot be disjoint or partially overlap because the term 'relation' could not be used solely to define relevance and relevance would not always be a relational term. The only possibility is that relevance is a subcategory of relation and is defined by way of its genus.

Table 26. Types/Directions of Relations between Two Relata.

Form	General Statement	Specific R _s Statement	Corresponding R _s Statement
$f_1 \rightarrow f_2$	Snowshoe hares make a difference to red foxes.	Nutrients are transferred from the snowshoe hare to the red fox.	Snowshoe hares are relevant to red foxes.
$f_1 \leftarrow f_2$	Red foxes make a difference to snowshoe hares.	Red foxes kill snowshoe hares.	Red foxes are relevant to snowshoe hares.
$f_1 \leftrightarrow f_2$	Red foxes and snowshoe hares make a difference to each other.	Habitat use of the snowshoe hare affects habitat use of the fox and vice-versa.	Snowshoe hares are relevant to red foxes and vice-versa.

6.1.4 Relevance as a Relation of Significance

As much as the above analysis might clarify the notions of relation and relevance, it does little to establish whether relevance is or ought to be limited to relations of significance, even though the example is one. To explain, a fox is an object of significance in its own right by virtue of being an organism that has a need to survive, acts in such a way to survive, and, to do so, evaluates and selects particular food items. By such a need and act, the selected food item is an object of relevance to the fox because it makes a difference to the fox. In contrast, hydrogen makes a difference to oxygen (and vice-versa) because the association of the two alters their structure and generates a whole with properties that the individual elements do not have when dissociated. Although the relation is generally one of making a difference, neither element is constituted as such to need the difference that the association makes. So, we can ask why hydrogen and oxygen are related/associated by appealing to atomic configuration/forces but we have trouble answering why they are mutually relevant, unless we appeal to a definition that stipulates that they are relevant. Saying that hydrogen is relevant to oxygen does not sound right. But this is just an appeal to intuition. Nonetheless, we can ask others if it appeals to their intuitions, which I've done on a limited basis and encountered the same impression. Further, we can ask why such a statement does not sound right. I think it does not sound right because we have become used to using relevance in a particular way. As the historical research and analysis of dictionary definitions show, relevance has almost exclusively be used to identify relations of significance. Specifically, the reason that 'hydrogen is relevant to oxygen' does not sound right is that neither has a need to be associated because neither is an object of significance.

Relations of significance and non-significance can also be examined within the context of an inquiry. We could follow Hitchcock or Bunge and say that f_1 is relevant to f_2 in relation to a goal of inquiry; such as, determining predator-prey or molecular dynamics. In that case, we would say

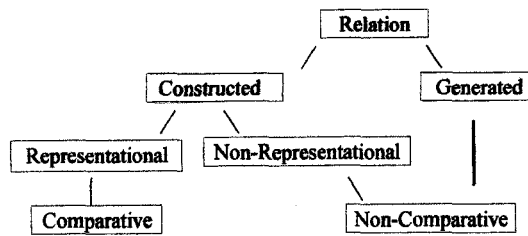
that the snowshoe hare is relevant to the red fox and that hydrogen is relevant to oxygen in relation to respective goals of the two inquiries. But this is not quite right. The snowshoe hare is relevant to the red fox because of the nature and acts of the red fox, not because of our goals. Similarly, hydrogen does not become relevant/significant to oxygen because of our goals. Rather, the system composed of the two objects, whatever the relation might be, significant or otherwise, is relevant to the goal (G) of an inquiry. This can be symbolized for a predator prey system as $(f_1 \xrightarrow{R} f_2) \xrightarrow{R} G$ and the water molecule as $(f_1 \text{ combines with } f_2) \xrightarrow{R} G$. This model is similar to the structure outlined by Hitchcock in relation to his definition of ‘relevance’ as a triadic relation (1st term \xrightarrow{R} 2nd term/goal in a situation). However, I have used the word ‘context’, which I understand as a conceptual system (inquiry goals), and I recognize that the referent of the first term can be a system of any type, level of integration, or degree of complexity.

6.1.5 Classification of Relations

If we accept limiting ‘relevance’ to relations of significance, we need an understanding of relations and how relevance as a kind of relation fits in with other kinds. Terminology is a potential stumbling block because I want to avoid using problematic words like ‘nature’ and ‘natural’. Nonetheless, various meanings have been assigned to the terms ‘generated’ and ‘constructed’, which are the terms I have chosen. To avoid potential difficulties, I will stipulate particular senses for these terms and hope that interpretation will be limited to those senses. Also, in defining ‘constructed’ and using the term ‘construct’, I diverge from Bunge’s definitional framework where ‘construct’ is limited to a sub-class of mental objects (concepts). Although I broaden the notion assigned to ‘construct’, I remain within Bunge’s ontological perspective and framework. I begin by distinguishing the class ‘relation’ on the basis of agency. Accordingly, this conception concerns dynamics and emphasises origin. Specifically, constructed relations require an agent, whereas generated relations involve no agent. This means that biotic objects are responsible for constructed relations and abiotic objects are involved in generated relations. I have also incorporated a distinction between comparative and non-comparative relations (Fig. 8). Definitions of the following terms are provided in Table 27, Section 7.3.

Generated Relations. Abiotic objects generate relations when, for example, atoms combine to form a chemical compound, electrons flow (lightning) and produce air vibrations (thunder), the wind blows a speck of dust into my eye, or a rock strikes a mountain goat and causes it to fall from

Figure 8. Tentative Classification of Relations.



a cliff. The direction of relation is from an abiotic generator to any other object. As such, no relation of this type could be a relevance relation because no such object is of significance. That is, we would not say, 'My eye is relevant to a speck of dust' because it was blown into my eye and is now lodged there.

Constructed Relations. Biotic agents construct relations when, for example, genes regulate the synthesis of proteins; a moose browses on a willow twig; a spider weaves a web; a sensation produces pleasure; or a human perceives, thinks, and writes a sentence. In each case, an object of significance is involved because each acts in a significant way; e.g., to survive, solve a problem, or communicate. So, atoms and compounds are relevant to genes, twigs are relevant to moose, webs are relevant to spiders, and percepts, thoughts, and sentences are relevant to humans. Further, the first three examples involve non-representational constructs and the last two involve representational constructs. Concerning the former, I can construct an association between the physical symbols '\$%*@', which are constructs themselves and as symbols each has meaning but the unit defies convention (previous/accepted acts of designation) and is, as far as I know, nonsense; hence, non-representational. Similarly, I can associate the two concepts 'round' and 'square'. Although each has a factual referent, the unit has no factual referent and cannot even be imagined. So, it is non-representational in these senses. In both cases, these constructs are relevant to me to make a point. Concerning representations, I can associate percepts (which are constructed for us) or concepts (which we mentally construct) of two factual objects (e.g. 8cm Fact *A* and 2cm Fact *B*); compare their respective sizes, which is a further cognitive operation; construct the symbol '>' to represent how the two conceptual objects have been ordered in my mind with respect to size; and write '*A* > *B*' or '8 > 2'. When *A* and *B* have factual referents (two zucchinis in my garden), the connection between the conceptual objects is constructed through a cognitive

operation. The purpose here is epistemic (e.g., to understand) and/or pragmatic (e.g., to maximize nutrient intake) and the constructed objects are relevant to me in making a point, which is to tend my garden or to survive. In contrast, in non-comparative relations the relation is not a cognitively dependent mental object. They include either constructed or generated relations. First, the blade and handle of a hoe are constructed relations. They are relevant to me, given that I need to weed the garden. Without this need, they would not be relevant, unless I had another use for them. Second, the distribution of soil particles in my garden prior to my efforts are relations generated by a combination of erosion and deposition and, as abiotic objects, they do not involve relevance relations among themselves. However, the distribution of soil particles are of relevance to me, especially if fine clay particles coalesce to form a cement-like surface, because they affect how well my plants will grow.

6.1.6 Summary and Conclusion

The deceptively simple statement ‘Relevance is a relation’ turns out to involve a complex set of issues. Without addressing these issues, the statement opens up possibilities for conceiving of relevance incorrectly, identifying incorrect relevance relations, and constructing a misrepresentative theory of relevance. To address these issues, we need to examine the term, concept, and referent systems in which ‘relevance’ occurs or to which it applies. We also need to examine the set relations that ‘is’ indicates.

First, ‘relevance’ is a term and a concept that has a representational function. In a general sense, it designates a referent system that is composed of at least a binary relation. It also designates an unspecified relation. When ‘relevance’ and ‘relevant’ are used in relational statements, they are combined with at least two relata terms. The statement as a whole identifies a referent system composed of at least two associated objects. These objects must be specified in a relevance statement but, because relevance is the relational term, the identity of the relation is not specified. Identifying that relation must be done by the person constructing the relevance statement. Otherwise, the referent system must be known sufficiently well and the wording or context of the relevance statement must allow *identification of the particular relation*. If not, the relevance relation is indeterminate. Despite the non-specification of the relation, ‘relevance’ and ‘relevant’ do have a specific function, which is to indicate a particular direction of relation between the relata. This direction, at least for the cases examined, is opposite to that of the direction of determination. As

such, relevance does not include all types of relations. Rather, it includes the set of non-determinant relations abstracted from a referent system; e.g., 'x is relevant to y because y determines x' or 'fibre is relevant to my health because my nutritional needs determine what foods are edible.'

Second, the relation between the concepts of relevance and relation must be sorted out further, particularly given the history of the term being limited almost exclusively to relations of significance. When considering statements like '8>2' or 'hydrogen is associated with oxygen', we have to consider whether or not it makes sense to say '8 is relevant to 2' or 'hydrogen is relevant to oxygen'. To me, the statements sound counter-intuitive. In contrast, saying that a rabbit is relevant to a fox does not jar the intuitions because we understand that the rabbit satisfies a need of the fox. I suggest that our intuitions result from how we have become accustomed to using relevance, which is a function of how relevance has been historically used and defined by others. As suggested in Chapter 4 and further explored in Chapter 5, relevance has been conceived largely as a relation of significance, which means that an object of significance, an organism, must play a determinant role in bringing the relevance relation into existence through its constructive acts. But 'relevance' is a linguistic object constructed by humans through cognitive operations and the meaning associated with it is through convention. Such flexibility explains why so many stipulated definitions have been advanced over the last 50 years or so. The crucial decision concerns whether or not it is advantageous to conceive of relevance as a relation of significance, which can be addressed by determining whether or not it helps solve other problems. This issue is addressed in Sections 6.2 and 7.3 where I discuss the issues of degree of relevance and strength/sufficiency of argument and provide an account of relevance, respectively.

6.2 Degree of Relevance and Strength/Sufficiency of an Argument

In this section I outline and comment on four positions taken on whether or not relevance varies in degree. In particular, I analyse and evaluate each position and offer alternative accounts based on the conception of relevance as a relation of significance. I present an overall conclusion in the last section.

6.2.1 Naess' Account of Degree of Relevance and Strength of an Argument

Arne Naess (1947) provides an account of both relevance and degree of relevance within the context of his elucidation of the development, structure, and evaluation of argumentation

concerning “difficult courses of action” (97.1). To understand his notion of degree of relevance, we must first understand his conception of relevance. But before that, we must understand his conception of argument, argumentation, and other related concepts. Naess uses the term ‘argument’ to denote both premises and sub-arguments adduced in relation to a standpoint taken on an issue (106.3). He sees arguments to be “appeals to rationality in the light of the facts” or, alternatively, “that element in our expression which carries the power to convince people in rational discussion, that is, their factual content and consequences” (97.1). Accordingly, he distinguishes reason (what speaks in favour of a standpoint) and motivation (psychological, sociological, and other causal factors that motivate a decision) and identifies/discusses two main rational evaluation criteria (98.2). First, tenability generally concerns the “cognitive adequacy or inadequacy of reasons” (98.2) or, more specifically, the likelihood of truth or falsity of factual claims or the acceptability of normative principles (110.2). Second, relevance concerns how strongly an argument “speaks for or against” a standpoint, which varies and is its proof-potential. As such, relevance is conceived in such a way that it varies in degree. According to Naess, asserted relevance relations are assessed, in descriptive matters, by determining how likely it is that, if the premise is true (tenable), so too is the standpoint or conclusion, where likelihood also varies. In normative matters, asserted relevance relations are assessed by the consistency between (i) principle and action and (ii) action and consequence (110.2).

According to Naess’ conception, (i) tenability and relevance are evaluation criteria that are applied to arguments; (ii) tenability and relevance are linked to two elements of expression that have the power to convince; i.e., expressions of factual content and consequences of actions; (iii) tenability and relevance have a distinctive set of relations where tenability concerns an individual claim and relevance concerns a relation between claims; (iv) relevance subsumes strength, which Naess considers also to be variable; and (v) a relevance judgement is a normative assessment of a relation between premise and conclusion, which is either likelihood or consistency, and involves the transfer of tenability from premise to conclusion. Three main comments are in order.

First, as evaluation criteria, tenability and relevance *apply* to constitutive elements (factual content/consequences) of an expression that functions as a premise. The relation between the evaluation criteria and content of an expression is not clear, other than it is indicated by the general relational term ‘apply’. The evaluation criteria may be depicted as being above or before and distinct from the expression to which they are applied (normative level/relevance judgment →

object of evaluation/premise). If so, what is clear is that discovering the criteria requires a higher order cognitive process that operates on two lower order mental objects, which are themselves ordered at two levels: an implicit/explicit evaluation and its object, an expression (meta-level evaluation \rightarrow {normative level/relevance judgement \rightarrow object of evaluation/premise-conclusion}). This model, albeit common, does not help identify the relation between the evaluative judgment and its object. It is a start but it can take us in the wrong direction. To continue, considering that 'relevance' is a non-specific relational term that indicates a more specific relation, the relations between premise and conclusion, as identified by terms like 'inference', 'entails', 'supports', and 'makes likely', are specific kinds of relevance relations. That is, relevance is not a specific kind of relation itself in addition to relations indicated by the previously mentioned terms. Rather, the term 'relevance' is a broad inclusive term that indicates or subsumes types of relevance relations, of which inferential relations are one particular kind.

In support of this claim about relevance, consider the factual issue of what caused a flood and corresponding claims. Where T is a threshold and x is a positive value, 'The amount of rainfall was $T+x$, whereas the amount of snow melt was $T-x$. Therefore, rainfall, not snow melt, was likely the predominant factor that caused the flood.' Supposing that the data are reliable but not supposing they are complete, the premise that rainfall exceeded a threshold, but snow melt did not, makes the conclusion likely true. That is, the tenability of the premise is transferred to the conclusion to make it tenable to the degree that the premise is tenable. The conclusion is not entirely so because other factors might have played a role in the flood. Claiming that the premise being true makes the conclusion likely true is an abstract relational statement. The premise-conclusion, as a specific relational statement, is a linguistic device that represents a referent, which in this case must be a factual system. So, the premise-conclusion relation involves a claim that the referents are associated as asserted. Specifically, the assertion is that rainfall, not snow melt, caused the flood, which involves a complex series of causal relations vaguely represented by the premise and conclusion. Given that the premise-conclusion purports to represent a factual system, an accurate hydrological model of the particular watershed to which the argument refers must be developed and such a model functions normatively when applied to statements concerning the state or dynamics of the watershed. That is, the hydrological model has a dual function of factual representation and normative evaluation. Normatively, it supplies the necessary and sufficient conditions (number of flood factors) that a conclusion must satisfy and premises must express,

which is a specification of sufficiency conditions. The hydrological model is also used to rule out erroneous premises.

The preceding explanation has focussed on the referential function of a relational statement (premise-conclusion) and relevance as a connection, where relevance indicates or subsumes a host of different connections from the linguistic level, as expressed at different levels of generality, down to the referent level. However, the notion of significance has not yet been mentioned. Given that the premise concerns the facts designated by 'rainfall' and the conclusion concerns the facts designated by 'flood', the premise-conclusion relations are entirely factual. Conceiving of relevance as a relation of non-significance, we could say, 'rainfall is relevant to the flood'. It would be relevant by virtue of the fact that rainfall caused the flood and the statement would specifically mean 'rainfall is a predominant factor in causing the flood'. This example would suggest that such premise-conclusion relations are not relations of significance. However, the dimension of the relevance statement identified is its function in representing facts. Even though the premise and conclusion express factual representations of causal relations, the *information* expressed through the premise (a conceptual object) is relevant to the conclusion (a conceptual object) because the conclusion represents an answer to an epistemic problem, which is framed by the question, 'What caused the flood?' In other words, the premise and conclusion are conceptual entities connected to an epistemic problem, where the conclusion represents an answer to a problem that we try to solve through the premises. Hence, the conclusion is derivatively an object of significance because it is constructed by a being of significance. Interpreting factual premises and conclusions to be relations of non-significance is based on appearance.

Second, Naess assigns the power of convincing to an expression. Because relevance, as he conceives it, is an element of a premise-conclusion relation, relevance would have a power to convince. I suggest that both claims are incorrect and misleading. Certainly, spoken and heard expressions involve physical objects that are dynamically linked. Specifically, a spoken expression has qualities that can generate a complex set of emotive responses but these can also be partly modified by rational responses. (Test: When hearing bad news, consider how you feel and consider how you reason or rationalize to manage the emotional response.) So, when people speak, they exercise the power to influence and when people listen, they are influenced by the physical dimensions of an expression and an interpretation of its meaning but both are mediated by other responses. However, attributing to an expression or relevance the power of convincing is another

matter. If expressions cause beliefs, we would have no choice in what we believe, as NaCl has no choice but to dissociate in distilled water. But people can lie to themselves and to others or otherwise refuse to believe what is evident to them. The attribution of power to an expression is misleading because it directs us to the wrong explanations of belief and relevance. Further, any such explanation would require elucidation of causal mechanisms. Without them, we are left with appeals to intuition, which fails to identify underlying cognitive mechanisms. In contrast to Naess's position, I suggest that evaluating tenability and relevance is an implicit or explicit cognitive process, which is a higher order evaluation of a mental object - the expression. So, our task is to examine such processes, understand what evaluations are made, and articulate the cognitive and rational mechanisms involved. The explanation of relevance judgments by way of a hydrological argument is one step in that direction.

Third, Naess conceives tenability and relevance in terms of each having a distinctive set of relations, which are referential/evidential and inferential relations, respectively. However, analysing these relations further reveals that tenability and relevance are interrelated in a complex way. Briefly, establishing referential/evidential relations involves determining what evidence is relevant to an epistemic goal; such as determining what caused a flood. Inferential relations presuppose a relevant connection between two statements, which I suggest involves a relation of significance. Further, whatever is represented by a premise by way of its referential/evidential relations is transferred to the conclusion. Consider the equivalence relation: $2+2 = 4$ or the hydrological argument presented above. In both cases, the premises contribute something to the conclusion. I will elaborate further on these relations at the end of this section. Now, we turn to the remainder of Naess's account of argumentation and degree of relevance.

Naess distinguishes two kinds of argument surveys (inventories) that can be taken with regard to a particular issue. Although he does not say so, such a survey involves relevance judgments that are determined by the issue of interest. Nonetheless, he explains that the first survey is conducted not to make a decision but merely to take an inventory of any argument advanced, pro/contra, relevant/irrelevant, or tenable/untenable in relation to an issue. The second survey often follows or is based on the first survey but the intent is to make a decision. So, judgments are required to select only tenable and most relevant arguments. These are then organized in two ways: hierarchically to show the structure of the complex argument and in terms of their stand for or against the standpoint (102f). Naess claims that the relevance judgment is ultimately intuitive but

such reliance does not necessarily lessen the certainty of the judgment because an explanation might be offered at a later time (109.4). However, as noted below, he does not offer any explanations for the examples that he provides, which we need to develop a theory of relevance.

Naess identifies a pitfall of assessing arguments for or against a standpoint, which involves evening the weight of arguments or losing sight of the essential elements that are conclusive. He explains that to guard against such a pitfall, we must learn how to evaluate arguments for and against a standpoint, which includes assessing tenability, relevance, consistency of a set of arguments/premises, sufficiency, and correctness of inference, and we must realize that some arguments are more relevant or more conclusive than others (102.1, 107.3). Further, standpoints must be clearly/precisely stated to determine the relevance of arguments to it. If the standpoint is complex, it must be broken down so that arguments for or against each element can be aligned accordingly (104.4; 105.2). To decide between alternative standpoints, Naess indicates that “we normally weigh the various considerations which we take to be relevant and base our decision on an estimate of their relative importance. The same applies to any arguable issue” (97.1).

Naess provides several examples to illustrate his account. The following examples concern degree of relevance with respect to a descriptive (DI) and normative issue (NI). Where F_0 , P , and C are the standpoint, pro-argument, and counter-argument, respectively:

- (DI) F_0 : It will rain tonight.
 P_1 : The sky is covered with gray clouds
 P_2 : The swallows are flying low.
 C_1 : The barometer is rising.

Naess explains that, in this case, degree of relevance of P_1/P_2 and C_1 is a function of the “hypotheses” ‘ $P_1/P_2 \rightarrow F_0$ ’ and ‘ $C_1 \rightarrow \text{not-}F_0$ ’, respectively. To note, these hypotheses are often referred to as conditionals or warrants in the terminology employed by Toulmin (1958), Blair (1989, 1992), or Freeman (1992). Naess explains that, to decide, we must compare the strength of the two hypotheses. In doing so, he claims that the relevance of P_1/P_2 is “slight”, which makes F_0 extremely uncertain, particularly given P_2 . However, he does not explain why P_1/P_2 is slight. So, we are, again, left with the ‘blank space’ that intuition provides. Explaining the relevance relation requires establishing whether or not a positive association occurs between the proposed factors (density/coverage of clouds, flight of swallows, and barometric levels) and precipitation, either in terms of being a cause or indicator. It also requires detailing the complex meteorological system sufficiently to identify its composition and structure so that we can understand the role and

reliability of those factors. As science has shown throughout the ages, intuitions can lead to strong but incorrect convictions and the nature of facts can be highly counter-intuitive (Bunge 1962, 1998a; Sagan 1974; Wolpert 1992).

The example of a normative issue is as follows.

- (NI) F₁: As long as I study I have to devote all my time to my subject.
 (F₂: I must set aside some of my working hours for reading poetry.)
- P₁: I will be earning a steady income a year earlier. C₁: I shan't be a social success.
P₂: I shall be a useful member of society a year earlier. C₂: I shall become one-sided.

Naess specifies that (i) the decision maker considers the tenability of all pro- and contra-arguments to be the same and (ii) degree of relevance must be the decisive factor, which in this case is contingent upon the implicit or explicit norms that are accepted (111). Naess reports that the decision maker prefers being a useful and prosperous citizen over having a rich inner life with no money. So, the decision maker accepts F₁ (112.1). Implicit in Naess's account is that the weight attached to an argument or norm is a function of preference, which is a complex assessment that includes consideration of relations between a person, acts, and consequences and depends on knowledge of those objects. Again, to avoid intuitive appeals and to provide an explicit account, this system must be elucidated in sufficient detail to permit identification of both the essential elements and the structure of the system. Doing so involves a host of relevance judgments that generally involve concept-fact relations, as Bunge outlines. Further, given that preference is the source of argument weight, to have a preference requires the existence of a being of significance. So, the notion of significance is key to understanding the nature of relevance relations and related notions like tenability, degree of relevance, and strength.

6.2.2 Blair's Account of Degree of Relevance and Sufficiency

J. Anthony Blair (1989) examines the issue of degree of relevance within the context of related work by van Eemeren and Grootendorst (1984), who conceive of relevance as the potential of premises to justify or refute a conclusion, and both Krabbe (1987) and Naess (1966/1947), who conceive of relevance as the potential of premises to prove a conclusion (69.2f). Blair (71.3) also reports that Naess conceives of premise relevance in terms of 'speaking for or against' a conclusion. Blair suggests these broad conceptions of relevance are essentially the same and

analyses them into two elements: (i) the bearing that premises have on a conclusion and (ii) given that they do bear on the conclusion, the degree of support provided to the conclusion. He names the first 'relevance' and the second 'sufficiency' (69.3) and implies that the former is logically prior to the latter. Blair then takes up Naess's contention that 'speaking for or against' a conclusion can vary in extent. He agrees with Naess that relevance varies in degree but opposes Naess's definition. Specifically, Blair reports Naess's claim that, in relation to a normative issue expression *Fo*, premises *P* vary in degree of relevance according to the degree of their value or the benefit that accrues when the premises are realized (71.2f). Blair suggests that, by Naess's account, the value of the premise, "The threat of nuclear war is ended for all time", should make it highly relevant to *any* conclusion such as, "Canada should add frigates to its navy". He concludes:

But *P* does not speak for or against *Fo* at all; in fact, it seems just irrelevant to *Fo*. Granted that if a normative *Fo* is causally sufficient to effect a *P*, then the greater the value of that *P* or the benefit of its realization, the greater the relevance of *P* to *Fo*, but that is not the condition Naess lays down here, for he goes on to add: "This rule applies *also* [my stress] where *P* is an assertion about what follows from accepting *Fo*..." (p. 109). So Naess's attempt to differentiate between relevance in arguments with descriptive conclusions and arguments with normative conclusions needs revision. (71.3)

First, Naess's primary condition of 'relevance' is that a premise must speak for or against a conclusion (110.2). So, Blair's premise cannot be used to support *any* conclusion. Rather, it must support a conclusion to which it is relevant. Further, whether or not the premise in Blair's example speaks for or against the conclusion is indeterminate because insufficient information has been provided to determine a connection between the two statements. If the lack of nuclear threat is accompanied by a greater risk from other sources for which frigates are designed (i.e., surface or submarine attack), then the premise would speak/be relevant to the conclusion. However, if the lack of nuclear threat is accompanied by a risk reduction from other sources for which frigates are designed, then the premise would speak against the conclusion. In this case, contrary to Naess's definition, the premise would be irrelevant because relevance denotes a connection and must be positive despite that 'speak against' linguistically alludes otherwise, as previously discussed in Section 3.3. Instead, the premise would be relevant to the opposite conclusion and the issue itself.

Second, Blair's example is not consistent with Naess's account, given that Naess is concerned with the adoption of a position on an issue where premises represent benefits or consequences of adopting that position. Blair's premise (end of nuclear threat) is not a consequence of adopting the conclusion (adding frigates), which is a position on the issue of whether or not

Canada should increase its naval capacity. In contrast, a relevant premise satisfying both accounts would be 'Canadian sovereignty and citizens would be protected from current increase in submarine and surface threats.' This premise, if realized, would have greater benefit than realizing the premise 'More Canadians could become naval officers and earn a greater income.'

Third, Blair speaks problematically about the causal efficacy of a premise. Further, Blair writes in terms of the causal *sufficiency* of a normative conclusion to effect a premise that can vary both in its value/benefit upon realization and its relevance to the conclusion. So, he accepts the idea that relevance varies in degree but conceives it ultimately as a function of the causal sufficiency of a normative conclusion.

Blair's position on degree of relevance in this paper arises from his conceptions of premise relevance, which he also connects to sufficiency. I suggest that all these concepts require clarification. Blair defines relevance by way of the synonymous relational terms 'having something to do with' and 'bearing on' and associates relevance with the expression "have some bearing rather than none at all on the claim in question"(68.2f). That a premise has *some* bearing on a conclusion could mean that (i) a premise provides partial support or meets part of the sufficiency requirement without any variance occurring between premises in providing such support or (ii) a premise differs from others in the degree of support that it provides to a conclusion. Determining and specifying why relevance varies would rectify this ambiguity. Blair also explains that a relevant premise causes a person to be more or less inclined to accept a conclusion than he/she would be otherwise (68.2f). Here, no mention of relevance varying is made but clearly belief is subject to variance. Additionally, Blair associates sufficiency with relevant premises that "provide more or less support for the claim in question" (69.3). This phrasing is similarly unclear as the previous one containing 'some'.

Whether or not relevance varies in degree and, if so, why it varies, depends on the conception of relevance. First, if relevance is defined only in terms of connection, it could be treated as a discrete value and might be analogous to a light switch that connects or disconnects when on or off and permits only a fixed current to flow when on. In such a case, relevance would not vary in degree. However, we cannot say that relevance is like a light switch because we need to know how the relata of relevance relations are connected and, even with such connections, we might find examples to confirm that they can vary in degree, as they can with physical objects other than light switches. For example, two boards vary in their connection to each other depending

on their degree of overlap. So, the question is, which of the two analogies corresponds to relevance? I have not addressed this question but I suggest that an adequate sample of relevance statements should be examined with this point in mind. Nonetheless, suppose that relevance is defined only in terms of connection and that these connections are discrete. Strength of a premise would be a function of its connection, whereas sufficiency would be a function of the number of premises/connections required to establish a conclusion, where each premise would connect to the conclusion to the same degree and have the same strength. A corresponding analogy would be connections between two braided wires where the individual filaments are the same gauge and the flow of current is a function of the number of individual wires connected. Sufficiency would be determined by the capacity of the wire to conduct electricity or the threshold level of current needed to run an appliance.

Second, if relevance is defined as a connection of significance and even if it is found that connections in relevance relations do not vary, relevance can still vary because significance varies. The appropriate analogy would be that relevance is like a dimmer switch that allows a variable current to flow when a connection has been made or relevance is like two braided wires, where individual wires are different gauges. In such a conception, strength would be a function of both the number of connections and the significance of each one.

Concerning sufficiency, Blair makes an apt point by distinguishing between it and relevance. However, as he intimates, a link occurs to relevance. As discussed below, that link involves (i) relevance as a connection of significance, of which strength is a measure, and (ii) the degree of strength required to establish a conclusion fully, which can be conceived as a match between the premise set and the conclusion.

6.2.3 Hitchcock's Account of Degree of Relevance

David Hitchcock (1992) discusses the issue of whether or not relevance varies in degree, notes that others express relevance in degrees, but does not find such evidence from his personal "attunement" to usage of the term over several months. So, he indicates that his intuitions on the matter conflict (252.4; 266 endnote 6). He considers possibilities to resolve these conflicting intuitions but does not take a stand on the issue. I take up where he left off and I evaluate the solutions he tentatively proposes.

The first possibility that Hitchcock identifies is the claim that, because irrelevance does not

vary in degree, relevance does not either. Specifically, he writes:

“...it is tempting to argue that relevance is not a matter of degree, on the ground that irrelevance, its contradictory, is not a matter of degree: one thing is never more irrelevant than another to something.” (253.1)

The direction of Hitchcock’s thought is important to notice. His ground concerns the nature of irrelevance, which is what relevance is not. From this premise, he attempts to conclude what relevance is. In support of the claim, he gives the example that neither the invention of ice cream nor the freezing point of water are more or less irrelevant than the other in proving the Pythagorean theorem. He concludes:

“Each is equally irrelevant, or, better, simply irrelevant. Likewise, it seems, a relevant piece of information must be simply relevant, not more or less relevant.” (253.1)

Also notice his use of ‘seems’, which is used in place of an analysis and explication. In this overall passage, Hitchcock argues by way of analogy, as indicated by his use of ‘likewise’. Essentially, the argument is:

Irrelevance does not vary in degree, as shown by comparing the examples.
Relevance seems to be similar to irrelevance in this regard.
Therefore, relevance seems also not to vary in degree.

This argument is not particularly convincing because of its intuitive appeal. Also, the conclusion about the nature of relevance is based on what relevance is not. That is, he relies on not- α to make conclusions about α , where α is positive and logically prior to not- α , as is evident from the term ‘not- α ’ which contains ‘ α ’. Specifically, he divides objects into two categories α and not- α . Two interpretations are possible: (i) not- α includes all other objects than α , which means both sets include positive instances, and (ii) α exists or α does not exist; e.g., α = hobbits exist versus not- α = hobbits do not exist. The former set includes positive instances, whereas the latter set is empty. Both interpretations are needed to understand relevance and irrelevance statements.

Consider the case where α and not- α both designate non-empty sets and α single statement ‘ $x \xrightarrow{Rt} y$ ’ and not- α includes the set of statements ‘ $x \xrightarrow{Rt} z$ ’, where z includes everything except y . For example, the set α includes only the statement, ‘Dietary fibre is relevant to the physical health of organisms, like humans.’ The set not- α includes statements such as, ‘Dietary fibre is irrelevant to solving a mathematical problem, washing dishes, writing an essay, etc.’ In the first example, the

assertion is that a positive relation occurs between dietary fibre and the physical health of particular organisms. In this case, dietary fibre occurs within a greater physiological system, which must be understood and modelled to elucidate relevance relations. In the second example, the assertion is that dietary fibre is not associated with any of the listed objects. This set, then, is a list of statements through which an assertion of non-association is made. That is, the first statement expresses the assertion that the system named 'dietary fibre/physical health' occurs, whereas the second statement expresses the assertion that no such system like 'dietary fibre/mathematical solution' occurs. In terms of sets, then, the first set has a member but the second set is empty.

In terms of using not- α (irrelevance/non-systems) to determine the nature of α (relevance/systems), we have only a set of statements expressing what α is not, which concerns all objects (z) not associated with x . Even if we were to identify and describe everything not associated with x , we would still not know the nature of the relations x has with other objects. Similarly, where not- α (irrelevance/non-systems) is an empty set, which means it does not designate a system, the attempt to determine what α is (relevance) from not- α (irrelevance) is analogous to attempting to determine what something is from nothing.

Hitchcock also suggests following the legal distinction between relevance and materiality, where only the latter varies in degree. He concludes:

It would then be a misnomer to speak of one thing as being more or less relevant than another; rather we should speak of one thing as being more or less significant, important, substantial, or weighty than the other. In the case of arguments, such differences would be differences in degree of support, not in degree of relevance..(253.2)

Hitchcock does not provide legal definitions for either term and it is questionable that the distinction in law is made as he suggests. I have provided two brief accounts of these concepts but I should warn that the use of 'fact' is not consistent with Bunge's conception and how I have defined it. For us, a fact is an occurrence of objective existence. It includes things, properties of things, and states of things. Facts are distinguished from factual statements, which are conceptual objects that have fundamentally different properties.

Martin (2002) defines 'relevance' as the "relationship between two facts that renders one probable from the existence of the other, either taken by itself or in connection with other facts." She explains that relevance is the central principle that determines admissibility of evidence, which can be further limited by particular exclusionary rules. If not, all facts that have logical relevance to a fact in issue may be proved even though they are not an issue themselves. Martin discusses

materiality within the context of a Statement of Case, which is a formal written statement in a civil action served by each party on the other. It contains the allegations of fact that the party proposes to prove at trial, but not the evidence by which they are to be proved. It can also contain the remedy that the party claims in the action. Such statements must contain only material facts, which are those facts essential to the party's claim or defence, and not the subordinate facts that are the means of proving them. Similarly, the definition of 'relevant' in Hill and Hill (2002) is "having some reasonable connection with, and in regard to evidence in trial, having some value or tendency to prove a matter of fact significant to the case." Their definition of 'material' is "relevant and significant". Further, they explain that 'material evidence' is used to distinguish significant claims from totally irrelevant and trivial claims. So, in both cases, 'relevance' and 'materiality' are not distinct in terms of connection and significance but between connections of any significance and connections highly significant; i.e., the terms are used to distinguish between levels of significance. Nonetheless, Hitchcock's proposal merits consideration because we can develop conceptions in many different ways. However, his solution attempts just to follow a different convention and, without further research or analysis, we would not have any understanding why we would want to do so. Further, the problem arises between 'relevance' and 'relation' and whether 'relevance' ought to include all relations, which would include any fact-fact relation so that the flow of water in a creek would be relevant to a bubble floating on it.

Hitchcock's second possible solution to the issue of degree is:

"...to reject the inference that contradictories of relations that do not come in degrees also do not come in degrees. Uselessness and unhelpfulness, for example, are not matters of degree, but one thing may be more useful or more helpful than another". (253.2)

By reference to 'contradictories of relations', he means that relevance and irrelevance, as relations, are contradictories. Again, it is important to note the direction of inference, which requires untangling the first sentence of the quotation. As Hitchcock states, our option is to reject the claim that relevance does not come in degrees because irrelevance does not come in degrees. In positive terms, we have the option to claim that relevance varies in degree even though irrelevance does not vary in degree. Hitchcock provides the apparently analogous examples of uselessness and unhelpfulness and claims that they do not come in degrees, whereas usefulness and helpfulness do come in degrees. The implication from these examples is that, even though we maintain that irrelevance does not come in degree, relevance could/must be like usefulness and helpfulness and

come in degrees. I suggest that the account is problematic in two respects.

First, identifying irrelevance as a relation is problematic. As I've shown in my analysis of dictionary definitions and examples of relevance and by using the conceptual framework identified in the introduction, 'irrelevance' is used in a sentence on a page as a relational term. It indicates a relation between relata terms of the sentence. Conceptually, it indicates a relation in our minds between conceptual relata. However, in both cases, irrelevance, which means not relevant, indicates that *no relation* occurs between referents. To note, understanding irrelevance requires understanding relevance because 'irrelevance' is defined by way of relevance, which means that relevance is logically prior to irrelevance. Similarly, 'relevance' is used in a sentence and the concept of relevance is used in our minds to indicate a relation between relata terms and concepts, respectively. The term and concept indicate that *a relation* occurs between referents. A *statement* is used to represent referents. A *relational statement* is used to represent the state of a referent system. When relevance is conceived as a relation of significance, a *relevance statement* is used to represent the state of a referent system, where at least one of the relata is an object significance in itself (primarily significant) or is significant to an object of significance (secondarily significant). An *irrelevance statement* is used to assert that no such system as asserted occurs; i.e., no relation occurs between referents of the relata terms/concepts. To conclude, the use of the concept of irrelevance in an assertion about the state of the relata referents does not identify a relation between referents. Hence, irrelevance cannot be identified as a relation, which is indicated by the terms 'not-relevance' or 'not-relation'.

Second, the suggestion that relevance might be like usefulness or helpfulness, which vary in degree (253.3), is also problematic. Hitchcock provides no analysis of the relations between relevance, usefulness, and helpfulness, which is needed particularly because he defines relevance by way of helpfulness. Also, both usefulness and helpfulness might be kinds of pragmatic relevance. For example, the statement 'My computer is relevant to writing my thesis' is based on the fact that it is helpful or useful to that activity. As outlined in Chapter 4, relevance is a non-specific relational term that includes specific relations of significance. So, it functions to indicate them. Hitchcock also claims that uselessness and unhelpfulness do not vary in degree. But there are senses of these terms that clearly indicate that they do vary in degree. For example, OED defines 'useless' as "ineffectual", which refers to things that are "weak or tame in effect". 'Unhelpful' is defined as "unable to help; not rendering help", where 'help' is defined as "to make (an action,

process, condition, etc.) more effectual". So, unhelpfulness can mean less effectual. For example, someone, who is using a wheel barrow with a soft tire to haul a heavy load and has reached his destination, could claim that the wheel barrow was useless or unhelpful. The expression does not mean that the wheel barrow was of no assistance but rather it made the task more difficult than it could have been. Soften the tire and the wheel barrow would become even more useless. Three main points emerge from this discussion. Hitchcock provides us only with possibilities for addressing the issue of degree of relevance. However, the possibilities are problematic. The solution is to develop a theory of relevance based on systematically examined concepts and their referents as well as precise definitions.

6.2.4 Sperber and Wilson's Account of Degree of Relevance

Dan Sperber and Dierdra Wilson (1995) have sought to understand relevance as it applies to or arises within cognitive and communication events. Within this perspective, their notion of relevance is used to explain human psychology and behavior. They argue that, within communication and cognitive events, contextual cognitive effects (such as, implications, contradictions, and strengthening) are necessary conditions of relevance and that, other things being equal, the greater the contextual effects, the greater the relevance (119. 2). In other words, if I observe a person or someone points out that person to me and it leads me to make a great number of implications relative to other items in my field of view, the person is the most relevant item in that view. As such, they conceive of relevance as both connection and significance and hold that relevance varies in degree.

6.2.5 Summary and Conclusion



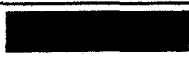
If we accept that relevance includes both the notions of connection and significance, we do not have trouble accounting for the claim that relevance varies in degree because significance clearly does. Aside from the examples that I and others have brought forward to confirm the claim and the definition and use of 'relevance' in law, at least according to Hill and Hill (2002) and Martin (2002), many other examples can be examined. For example, in constructing mathematical models (logically ordered conceptual representations) of physical or biological systems, sensitivity analyses can be done to determine which variables have the greatest influence on a predicted outcome. In environmental impact assessment, the relevance of an ecological change is determined

by its connection to an anthropogenic factor as well as its significance. In resource management, a similar situation arises in isolating critical features of, for example, an animal's habitat that merit management considerations. In economics, the law of diminishing returns refers to the diminishing amount of extra output when extra units of varying input (labour) are added successively to a fixed amount of another input (land), which means that, of all that is connected to a particular act, all is not of equal value.

Conceiving relevance as a relation of significance does not obscure as Hitchcock suggests but allows us to distinguish between fundamentally different types of relations. If a connection between two objects is one of significance, then accounting for strength and sufficiency is possible. Specifically, within the context of argument, strength is a measure of the significance of a premise or premise set. In terms of sufficiency, all necessary conditions must be expressed to establish a conclusion fully. When premises are insufficient to establish a conclusion, the strength of an argument can be determined by comparing what is required to what is expressed. Given that premises can vary in significance, the strength of an argument is not necessarily a function of just the number of premises expressed. Of course, to assess strength adequately, we need to know the relation between expressed and required premises. For example, if we have relative frequency data, we have an objective measure of strength. Without knowing the significance of expressed premises compared to that required to establish a conclusion, we are left assessing strength intuitively, which would be like attempting to calculate a fraction without the denominator. In such a case, strength is indeterminate and we are prompted to do more research, despite those who lament about or are dissatisfied with having to find necessary and sufficient conditions. The relations between relevance, strength, and sufficiency can be illustrated by way of a braided wire (Fig. 9).

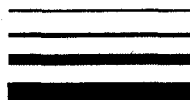


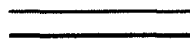

Figure 9. Braided Wire Metaphor.

(i) Deductive Argument.

	Premise	Connector*	Conclusion
Element of Braided Wire			
Example Argument	<ul style="list-style-type: none"> • All a are composed of p parts p_1 and p_2. • Object o is composed of p_1 and p_2. 	Equivalence between premise and conclusion concerning the membership or inclusion relation between o and a .	Therefore, object o is an a .


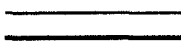


* Source: <http://www.specialtauto.com/delorean-parts/images/connector-feed-thru.jpg>

(ii) Non-Deductive Argument. (a) Epistemic Situation 1: Known Requirements.

	Premise	Connector	Conclusion
Required Elements of a Braided Wire to Make a Full Connection *			
Example Argument (Deductive)	<ul style="list-style-type: none"> • All floods F are caused when factors f_n reach threshold l at place s. • Event e composed of factors f_n occurred at place s and exceeded threshold l. 	Equivalence relation between premise and conclusion based on equivalence relation between F and f_n , e and f_n , and F and e .	So, a flood has occurred at place s .
Known Elements in a Given Case			
Example Argument	<ul style="list-style-type: none"> • All floods F are caused when factors f_n reach threshold l at place s. • Factors f_1 and f_2 occurred at place s. 	Partial equivalence between premise and conclusion (some necessary conditions are met).	So, a flood might have occurred at place s . Confidence: low

* Thinnest line = a single wire; thicker lines = multiple wires each of the same gauge as the single wire.

(b) Epistemic Situation 2: Unknown Requirements.

	Premise	Connector	Conclusion
Required Elements of a Braided Wire to Make a Full Connection	?		?
Known Elements in a Given Case			
Example Argument	The cliff is 100m and 50 degrees.	Partial equivalence between premise and conclusion.	I can climb the cliff.
Required Knowledge	<ul style="list-style-type: none"> • All physical conditions of the cliff and environment. • Degree of climbing difficulty as determined by my ability relative to the conditions of the cliff. 		<ul style="list-style-type: none"> • All physical conditions of the cliff and environment. • Degree of climbing difficulty as determined by my ability relative to the conditions of the cliff.

7.0 A Partial and Provisional General Theory of Relevance

Previous sections of my thesis contain detailed analyses and evaluations of relevance statements and definitions/positions on relevance. These analyses and evaluations provide the link between problem and solution in that they are the implementation of an approach. Such analyses essentially disassemble wholes into pieces and such evaluations determine which pieces to keep. These pieces are parts of the overall solution, which is a general theory of relevance. As a general theory, it focuses on the generic concept of relevance and concerns all types of relevance relations and expressions of them. Such a general theory is multi-disciplinary in both approach and content.

In this section, I assemble the pieces that are scattered throughout previous sections. This synthesis essentially provides a summary and conclusion. In presenting it, I have not included examples or literature citations contained in previous sections because I want to provide a concise summary of essential elements and avoid unnecessary duplication. Besides, the account I present here provides only a partial and provisional theory of relevance. It is partial because it represents only a small fraction of the literature that pertains to relevance and is only a fraction of the work that I have completed or see could be completed. Also, our knowledge and understanding from various disciplines (e.g., logic, psychology, information science) that have a bearing on a theory of relevance is always advancing. Such advances could inspire new insights or necessitate revisions to my analyses and evaluations, which is why I have separated them from the following synthesis. The account is provisional because it is partial. Accordingly, I see it to be like a technological prototype subject to further development and refinement.

7.1 The Problem of and Approach to Relevance

Problem-solving. Problem assessment is crucial to any research project because the nature of the problem determines the approach to it. Yet, some researchers launch into a proposed solution without first conducting a problem assessment. Problem assessment ought to occur prominently at the outset of a project as well as throughout a project because it is continuous with problem-solving. Knowing that one has found an adequate solutions to problems, like determining what relevance is/means and how relevance judgements are or ought to be made, is not a straightforward matter as is determining a solution to a mechanical problem where immediate and adequate tests are available. However, the problem of relevance has logical and practical dimensions and any proposed solution can be tested by its coherence, factual correctness, and how fruitful it is in

permitting greater understanding, applying to other problems, and developing further solutions. Such considerations ought to be made throughout a project.

Nature of the Relevance Problem. The problem of relevance is multidimensional in three main respects. First, it is a multi-disciplinary problem. As a problem named 'relevance', it occurs in a wide range of disciplines; such as, psychology, philosophy, information science, and law. But the problem of relevance is not necessarily restricted to disciplines that name a problem 'relevance'. So, the extent of the relevance problem is not revealed by those who name it, as the example from Aristotle's *Rhetoric* indicates. Determining its extent is one task in developing a general theory of relevance.

Second, the relevance problem is often expressed by the question, 'What is relevance?' This question breaks down to a semantic question concerning the meaning of 'relevance' and a factual question concerning the occurrence of relevance. Asking what 'relevance' means is a contemporary-historical question. It is a contemporary question because our starting point is an existing term that has meaning associated with it rather than either a new term that must be assigned meaning or an existing term that is to be assigned a revised meaning. It is an historical question because the process of concept formation and naming has already occurred and the term and its meaning have been maintained in English for hundreds of years. Thus, answering the question requires determining what meaning has been assigned to 'relevance' and maintained for it.

The meaning of 'relevance' is expressed both by its usage and the articulation of its sense in definitions that either attempt to represent or revise usage. As discussed below, relevance has been used and defined largely and essentially as a relation of significance rather than any relation whatsoever. This means that relevance relations are constructed through acts rather than generated by conditions. As such, the occurrence of relevance is a functional problem for all organisms in that relations must be established through constructive acts, cognitive or otherwise, to meet the various problems that living in a contingent world imposes. Even the simplest organism must determine, through physical mechanisms, which chemicals to assimilate or avoid and how to assemble chemicals in ways that permit growth, maintenance, and reproduction.

Relevance is also a cognitive problem. For humans, it is both a research problem and an enduring difficulty. It is a research problem for those who are attempting to discover, describe, classify, or otherwise elucidate the various types and characteristics of relevance relations. For example, psychologists experiment with physical stimulus-response or model stimulus-

cognitive/communicative effects to elucidate the mechanisms by which such events occur and explain them within a theoretical context such as evolution or behavioural ecology. Similarly, rhetoricians attempt to formulate principles of effective and appropriate communication/persuasion, which is a relevance relation between a speaker and an audience. The psychological work is descriptive/theoretic, whereas the rhetorical work is normative.

As an enduring difficulty, relevance is considered to be an unsolved problem because people consider proposed solutions to be inadequate. Accordingly, we must ask why problems remain unsolved or why proposed solutions continue to be inadequate. This brings into consideration obstacles that occur throughout the problem-solving process, where 'obstacle' is a third sense of problem. Researchers within particular disciplines, like information science and informal logic, suggest that the unsolved problems concern both semantics and methodology. That is, it involves defining 'relevance' and/or understanding its meaning and determining how to model relevance relations and evaluate relevance claims or presuppositions. The semantic problem is prior to the methodological problem because the collection of relations to be included under the term 'relevance' must be identified first. Only then can instances be identified as relevance relations and methodological accounts concerning them be developed.

Problems with Dictionary Definitions. Any theory of relevance must be placed within the context of the opportunities and problems that dictionaries provide. The advantage of dictionaries is that definitions are based on inventories of usage and some dictionaries publish instances of usage. Thus, dictionary definitions provide an essential data base to answer the question, 'What is relevance?' Further, terms used in a definition are almost always defined elsewhere in the dictionary. So, a rigorous semantic analysis can be completed. However, dictionaries are problematic in several respects. First, numerous dictionaries exist and definitions of 'relevance' vary considerably. Second, dictionaries provide unsystematic, imprecise, and highly abstract definitions of 'relevance'. Although the definitions indicate roughly how to use the term, which might suffice for ordinary use, they are of little value in contexts such as theory development, reasoning, and argument evaluation, where systematic definitions, concreteness, and precision are required. To overcome these problems an analysis and description of relevance statements are needed. Such an analysis would yield a more precise delimitation of the kinds of relations and relata subsumed by 'relevance'. Also needed is a shift in focus away from the sense of a single term. For example, Merriam-Webster defines 'relevance' as a relation without clarifying the

relations between these two terms/concepts. Such a definition gives rise to counter-intuitive expressions such as '8 is relevant to 2' because, by definition, 8 stands in a quantitative relation to 2. Other dictionaries define relevance by way of either synonymous terms (e.g., pertinence or bearing), which produces a circularity, or closely related terms (e.g., applicable), which necessitates determining senses that pertain to relevance. Because of these problems, dictionary definitions can lead to semantic instability because people must give the term a definite sense when precision is required. Doing so has produced many stipulated definitions of 'relevance', as we see in information science and logic. Third, despite the scientific orientation of lexicography, most dictionaries do not indicate how they arrive at their definitions. Hence, we have no way of determining whether their definitions correctly represent usage. Fourth, lexicographers' emphasis can be largely on sense, not referents. Emphasizing the latter would reveal the need to develop systematic definitions based on essential conditions rather than express a sense sufficient to make a term intelligible. That is, we should follow Samuel Johnson (1827) says: "I am not so lost in lexicography as to forget that words are the daughters of earth..." Fifth, despite lexicographers' definitions being a description of usage, construction of meaning through initial use or definition is prescriptive and our use of dictionaries takes their definitions to be prescriptive. Being descriptive (interpretive/constructive), lexicographers are not usually the prime generators of meaning. Rather, those who originally attribute meaning to a term are. Dictionaries play an important role in accepting established meaning and sustaining its use, as do other language users. Sixth, lexicographers are selective in what usage is included; hence, which definitions make it into the dictionary. This is particularly evident in definitions of types of relevance, which misrepresents their great variety. Reporting only a few types suggests an inadequate approach to inventory, description, and classification, which might be a function of working with an imprecise generic definition of 'relevance'.

The Problems with Stipulative Definitions. Stipulation facilitates reasoning and communication when a vague or ambiguous term is given a definite or more specific sense. So, the significance of stipulation is unquestionable. However, no stipulation occurs in isolation. Without situating a stipulation within its greater terminological and conceptual context, confusion can result. Such is the case with 'relevance' for which many definitions have been advanced in disciplines like information science and logic. More importantly, though, stipulation is an inappropriate means to answer the question, 'What is relevance?' As a semantic problem, the

question demarcates a point of time prior to asking the question. So, previous definitions and usage are required to answer it. In contrast, a stipulated definition demarcates a period of time beginning with and extending beyond the act of stipulation. Such a definition is peculiar if its use is limited to the person stipulating it. Whether an peculiar definition comes into broader use is a function of its communication, acceptance, and stability of continued use.

Problems with Word History. Given that the semantic context of a term is historical, our understanding of current meaning/usage is a function of both its prior definition and usage. However, neither a term nor its meaning always remain stable. First, most dictionaries attempt to capture a history of meaning that focuses on what is continuous with our current usage, although OED provides a greater historical context and includes many obsolete terms and senses. Even with an emphasis on current meaning and despite how hard lexicographers try, dictionaries are always some time behind the present because dictionaries are so labourious and time-consuming to produce. However, with online publication of dictionaries, the turn-around time can be shortened, as has occurred with OED (OED 2005). Second, etymological research attempts to trace the evolution of terms and senses through ancestral languages. Our knowledge here is limited by the extent and availability of research on particular terms/meanings of interest. Further, without accessing latest research, any etymological report can provide a misleading or incorrect context within which an explication of ‘relevance’ is attempted.

The Semantic Problem: Problems with Inventory. Addressing the semantic problem involves two general tasks: (i) identifying the basic concept of relevance and providing a generic definition to represent it and (ii) identifying and defining types of relevance relations or judgments. Each task presupposes an adequate inventory, analysis, interpretation, and evaluation of initial usage and/or definitions. Although such an inventory involves difficult sampling issues (e.g., adequacy of size, representativeness), it is relatively straightforward when we are interested only in a term. However, when we are interested in the basic concept, we have to take into consideration that it can be designated by synonymous terms and expressions. An initial problem, as Plato mentions, is that of identifying such an instance when the essential conditions of a concept have not yet been determined. Without the clear delimitation that essential conditions provide, we cannot determine whether an adequate or representative sample of terms/expressions that designate the basic concept has been collected. Nor can we determine whether the definition accurately represents usage. To resolve this problem we need to discover what meaning has been associated

with the term 'relevance', reduce expressions containing the term to the basic concept, and then identify instances of the basic concept as designated by synonymous terms and expressions.

The Semantic Problem: Problems with Terminology and Variable Expressions. Symbols are representational devices that provide a potentially unlimited flexibility in use. Such flexibility, when unregulated, as it largely is in natural language, can lead to a great variety of terms and expressions (statements and definitions). Such has been the case with 'relevance'. Through at least 25 centuries of language use, a complex terminological and conceptual 'heap', as Aristotle would describe it, has resulted in the form of various definitions, natural expressions, and attempted elucidations of relevance. When asking what relevance is, we find ourselves, as Hobbes aptly notes, like birds fluttering at a window attempting but unable to return to the outside after having come in through a circuitous route that started with the chimney and passed through several rooms.

An important task, then, is to sort this heap of terms and associated definitions. Because terms and concepts are representational devices, considering them in relation to their referent systems is necessary to arrange them systematically, even if a conventional classification system is developed from a particular perspective or a for particular purpose other than representing natural kinds. Ultimately, the referent systems can be either conceptual/representational or factual/non-representational. The former are pre-established and the latter are pre-existing. In either case, any approach must be scientific. Conflicting approaches include stipulation and intuitionism. Stipulation cannot answer semantic questions that concern either current or past meaning because it creates a new or future oriented semantic frame. Intuitionism fails to provide analyses and explanations/explications. Accordingly, I have not selected them for my study. The source of information is also crucial to answering the relevance question. Inadequate, problematic, or conflicting information sources include contrived examples developed to illustrate or prove a point.

In summary, what is needed to answer the relevance question is a scientific philosophical approach that involves (i) an adequate inventory of terms, natural expressions, and definitions; (ii) a sufficient understanding of language to permit accurate interpretation; (iii) a systematic analysis of the inventory to reduce the complex collection of terms and associated meanings to their basic concepts, (iv) a detailed analysis of referent systems; (v) a synthesis that arranges the terms and basic concepts systematically; and (vi) a broader conceptual system that adequately represents corresponding factual systems and within which the synthesis can be situated.

Problems with Examples Used to Illustrate Relevance. Two kinds of examples can be

used to illustrate the notion of relevance. One is actual use of the concept as designated by 'relevance', 'relevant', or a synonymous term or expression. Conformity to previous usage and the extent to which a particular sense has been used must be taken into consideration when providing a semantic account of relevance. The other kind of example is one that is constructed. Although constructed examples cannot answer the historical semantic question, they can conform to and elucidate a previous definition/use or new stipulation, although the latter may or may not conform to the semantic convention previously established. For example, stipulating that relevance is a relation does not correspond to previous usage of the concept as a relation of significance. Consequently, the example, 'Science is relevant to reality', conforms to the stipulation but not previous usage. In contrast, the constructed example 'The dynamics of predator prey relations are relevant to population ecology' conforms to the notion of relevance as a relation of significance. However, any constructed example runs the risk of being contrived or simplistic. The problem with them is that they can be insufficiently analysed and outlined, which means the elements and their relations are not sufficiently identified or detailed. This inadequacy could result from a lack of familiarity with or attention to referent systems. Accordingly, such examples provide only an appearance of conformity to a definition. If the example is not sufficiently detailed, it will not serve a theory well, and might even corrupt it.

7.2 Analysis and Evaluation of Relevance Statements

Starting Point - The Semiotic System. From an analytical/evaluative perspective, the first point of contact is with an expression of relevance, which is a linguistic system that occurs within a greater semiotic system. The linguistic system is limited to symbolic representational devices, whereas the semiotic system also includes humans and the environment within which humans exist and communicate through language. Specifically, the point of contact is with a linguistic system that contains the term 'relevance', its relatives, or some other expression that designates the same concept. We encounter such a system through hearing or reading terms that are organized into different levels of integration; such as, sentences and paragraphs. Upon such an encounter and to understand the symbols, we must interpret the meaning of the linguistic system, which takes into account origin, convention, peculiarity, referent systems, and our respective knowledge. To elaborate, the linguistic system originates through a constructive cognitive process, which is a subsystem of a greater biological process as well as the greater ecological system within which

both are situated. All have historical dimensions that bear upon current states and all must be understood to develop a complete theory of relevance. Concept formation can conform to previous convention or establish new meaning, which might or might not be accepted or continue within a system of language users. As symbols, terms and expression must be considered within the context of their referents. After all, the intent is to use a physical object as a representational device.

Reduction of Expressions and Modelling of Systems. Relevance statements, as relational statements, are term and concept systems. Both terms and concepts have a representational function and different statements can represent the same conceptual system. Accordingly, definitions of 'relevance' terms and various expressions must be reduced to their basic concepts and propositions. Then, a conceptual model must be constructed by considering the system of referents to which the basic concept or proposition corresponds. The direction of reference is opposite to the direction of evidence. In other words, the conceptual system is constructed to represent the referent system and the referent system determines the conceptual system. The determination is not causal. Rather, it is evidential, which brings into play the causal mechanism of cognitive acts. Analogies of the referent-representation association include original and copy, painting and print, performance and recording, landscape and photograph, touch and sensation, sensation and nerve impulse, pre-synapse and post synapse, nerve impulse and percept, and percept and concept. When the model of the conceptual system is tested to ensure it correctly represents its referents, the model can be applied normatively to evaluate the original definition or relevance statement. Such representation differs from the construction of goals, design/creation of artefacts, and the modelling of artefactual systems (e.g., political states, laws, or corporations), which are based on conceptions of future states and are similar to predictions except that they are acted upon to realize them. Such relevance relations are classified by Bunge as pragmatic. Analysing and modelling them has been outside the scope of this study.

Terminological/Conceptual Context of a Relevance Statement. A relevance statement is abstracted from a greater and more complex context of other terms and concepts, which represent either ideas or facts and these are situated within their respective hierarchic systems. A relevance statement must be situated accordingly. Otherwise, the abstracted statement could be misleading. First, if the statement is expressed within an ordinary context of language use and no author is readily available to clarify meaning, dictionaries are required to situate the statement within its semantic context because dictionaries are constructed to represent meanings of terms as shared by

a community of language users. That is, they attempt to represent a social convention concerning meaning. Further, a principal means of learning meaning is *ultimately* through a dictionary, given the degree to which they are used in teaching. By saying 'a principal means', I do not imply that they are the only or even the most important means of acquiring language. By saying 'ultimately', I do not imply that dictionaries are of immediate or direct importance to particular individuals such as pre-school children. However, they can indirectly influence such a child through their parents who have used dictionaries themselves or were taught through the use of dictionaries, particularly those parents of a different native tongue who have used dictionaries to learn English. How important dictionaries are in acquiring language is a factual matter to be confirmed through quantitative research.

Unfortunately, dictionaries can be of limited immediate help because definitions can be vague and/or unsystematic, which generates the need for further analysis to render a precise interpretation of the statement, assuming that the speaker/writer is not present to clarify intended meaning. Further, if a speaker/writer alters the meaning of a term through use or stipulation, the accompanying text must be consulted along with dictionary definitions of terms used in this greater context of text. In any case, the task is to determine what the speaker/writer means not what the listener/reader thinks or supposes the speaker/writer means or wants the statement to mean. Second, in specialized contexts like particular academic disciplines, a mix of specialized and ordinary definitions are used. Similar concerns result.

7.3 The Meaning and Occurrence of Relevance

In this section I assemble various substantive elements that have emerged from the analyses and evaluations presented in previous chapters. I also elaborate on these elements.

First Sense of Relevance: Connection. All relevance statements are composed of at least one relational term and two relata terms. Together, these terms are used to express an n -ary relation between referents of the relata terms. Delimiting or discovering the breadth of relations to which relevance refers is required to understand the notion of relevance, identify instances of relevance relations, communicate and reason effectively, and develop a theory of relevance. If relevance is conceived to be synonymous with relation, then 'connection' would be its only general sense. Any further specification of terms would identify a greater class within which relation and relevance would be included, the same class as relation and relevance, subclasses that identify

types of connections or objects, and/or the necessary or predominant characteristics of systems to which relational statements refer. In contrast, if relevance is conceived to be a relation of significance, then 'connection' would be the primary sense of relevance because it is logically prior to significance; i.e., significance presupposes a connection between at least two objects. Under this conception, a definition of 'relevance' would employ 'relation' to identify the class within which relevance is included and other terms would be used to identify the same class as relevance, subclasses, and/or necessary or predominant characteristics of referent systems.

Second Sense of Relevance: Significance. As outlined in Chapter 4, the history of using relevance indicates that it has been conceived largely as a relation of significance. Even if relevance were to be conceived largely or merely as 'connection' and function as a synonym of relation, distinguishing between relations of significance and non-significance would be desirable. First, a fundamental difference occurs between objects of significance and non-significance and the nature of their relations. Second, employing the notion of significance creates a conceptual link between objects that might otherwise be considered disparate, as discussed below. Such a link, permits greater integration of knowledge and understanding, or, as Heraclitus [5th C. BCE] said, unity in the face of diversity.

Significance arises with the emergence of life. Even simple organisms like bacteria are beings of significance because they must act to acquire nutrients, avoid harms, and reproduce. Not merely events, these acts demonstrate importance to the bacteria. Otherwise, they would not act the way they do or exist as they are. Further, such acts are selective in that they are species-specific or individual-specific determinations of what to do (e.g., acquire nutrients for growth or maintenance) and such determinations are a function of the bacterium's genetic constitution. Being selective, such acts are relevance determinations. These are similar to a human who is aware of a physiological problem like hunger, encounters a cognitive problem like the question 'What should I eat?', and assesses various options to determine what to eat. This assessment involves a succession of relevance frames; such as, edibility, nutritional quality, availability, preference, and dietary requirements/restrictions due to infirmity. Ultimately, however, a genetically determined physiologic change gives rise to a relevant act of consumption to satisfy the need generated by that change. The difference between these two examples of relevance determinations is that one is non-cognitive and the other is (partly) cognitive.

Relevance relations, as relations of significance, are separate and distinct from abiotic

relations because abiotic entities do not have internal mechanisms to direct their development and maintain their structure. Certainly, a water molecule has a propensity to bind with other water molecules and crystals develop under particular conditions. However, such growth is a function of the properties of water that change as environment changes. Unlike an organism, the water molecule has no control mechanism to maintain that structure despite varying external conditions.

Proposed Terminology and Classification. Developing a classification system and a set of terms applicable to various disciplines would be helpful in developing a general theory of relevance as well as elucidating types of relevance relations. First, developing a generic conception of relevance requires cross-disciplinary inventory and analysis of both statements and specific definitions. Second, elucidating each type of relevance presupposes an adequate understanding and conceptualization of the generic concept of relevance. A single framework would allow unified research, consistent communication, and exchange of findings among researchers from various disciplines. Developing the framework is as important as defining the unit of space designated by 'metre', which allows measurement regardless of discipline, or defining the pitch of sound as designated by the note 'A', which allows various musical instruments to be constructed or tuned so that musicians can play harmoniously.

Constructing a classification system and related nomenclature rests on the objects to be included in that system, which is why discovering the basic concept of relevance is so important. That is, without a definite delimitation, a representative sample of objects to be included in a conception could not be taken. As such, a representative description and classification could not be completed. Within the context of relevance as a relation of significance and the statements analysed in previous sections, I have adapted Bunge's (1974, 1996, 1997, 1998a/b, 2003) philosophic system and developed a preliminary classification system and nomenclature for relevance (Table 28). What is important at this time is not the name of a category but the differentiae that distinguish categories. The names could change after considering other possibilities that might better reflect the differentiae. The following provides a brief overview. For detail, see Table 27.

Relation is the basic category. Relevance is distinguished from relations of non-significance, where significance is a function of biotic acts of construction. I have tentatively called these acts 'relevance determinations' and divided them into cognitive and non-cognitive acts and named them 'relevance judgments' and 'relevance acts', respectively. A great number of relevance acts are undertaken by organisms and, at this time, I have not attempted to inventory, describe, or

classify them. However, I have divided relevance judgments into those that are made through conscious deliberation and those that are intuited. I have named them, 'relevance deliberations' and 'relevance intuitions', respectively. I have distinguished several types of relevance relations based on whether or not relata include representational objects.

General Function of the Concept of Relevance. Depending on the purpose and object of its application, the concept of relevance is used either descriptively or normatively. It is used descriptively when someone constructs a relevance statement to represent a referent system. Specifically, 'x is relevant to y' is constructed to represent a referent system that includes x, y and a general or particular association between them. An example of a descriptive relevance statement is, 'Penicillin is relevant to the treatment of infectious agents.' Such a statement might or might not be an accurate representation of the referent system, which is the object of a descriptive relevance statement. In contrast, when relevance is used normatively, the object of such a statement is another relevance statement. Considering the example, whether or not penicillin is effective against all infectious agents of all organisms or whether it is tolerated by the patient is an issue to decide. The role of relevance in this application is to express an evaluation of that statement in terms of its accuracy in representing its referent system. To summarize, a model of the referent system is employed in the processes through which descriptive and normative statements are constructed but the purpose of making a descriptive statement and the object of that statement differ from the purpose and object of a normative statement.

In both descriptive and normative applications, relevance provides a non-specific indication of a relation between at least two objects. Accordingly, a relevance statement can generate a 'why' question. Or, such a question can be anticipated in constructing the statement. In either case, a more specific relational term can be used or more information can be provided to show that the asserted relation occurs between referents. For example, despite positivist claims, Bunge (1996, 1999) maintains that a scientifically based philosophy is relevant to sociology. Both books explain why by identifying specific connections between the two disciplines. So, a relevance statement to be a well-formed must contain two parts: (i) the relevance claim and (ii) justification for that claim, which ultimately involves confirmation that referents are associated as asserted.

The non-specificity of relevance is not necessarily an impediment to reasoning or communication. In fact, it can work as effectively and efficiently as an enthymeme, provided that referent systems are well known (e.g., state of hunger, tastes, food availability). In such cases,

referent systems are assumed or held in the background until a questionable relevance relation is asserted. (e.g., when hungry, someone offers food that is disliked).

Being non-specific, the descriptive use of relevance designates a broad class that includes all constructed (factual or conceptual) relations determined by objects of significance. The normative use of relevance subsumes all criteria related to the evaluation of statements that purport to represent relations of significance. Normative criteria are derived from the frame of constructed relations because a particular statement purports to represent either an existing factual or established conceptual system. Correspondence is a matter of either factual or formal truth. In either case, a systematic approach that recognizes various levels of integration is required to understand and model relevance relations, whether they are factual, terminological, or conceptual, and to evaluate relevance claims.

Function of the Term 'Relevance'. The term 'relevance', in either its noun or noun adjective function, refers or applies to (i) a generic concept of relevance, as expressed by 'Relevance =_{df} a relation of significance'; (ii) types of relevance determinations (acts or judgments), as expressed by the name 'pragmatic relevance'; (iii) a conceptual system expressed by a statement and composed of an n -ary relation, as expressed by 'Relevance concerns statements of the form x is related to y , where the relation is one of significance'; (iv) a particular relation of significance, as expressed by 'Your answer is of relevance to my question'; (v) a referent biotic system, as expressed by 'Relevance is a function of an organism's act of construction'; or (v) a theory of any or all of the above, as expressed by 'In psychology, Relevance Theory concerns the maximization of contextual effects'.

Function of the Term 'Relevant'. The term 'relevant' is classified as an adjective, which is misleading if taken to signal reference to a property of the first relatum (e.g., a premise) or its referent. However, 'relevant' has a dual role as a grammatical connector and an indicator of a relation. That is, 'relevant' is used grammatically to indicate a connection between linguistic objects and conceptually to indicate a general or unspecified connector/connection between conceptual objects and their referents. Its role as an adjective, then, is to describe an aspect of the referent system; i.e., the connection between referents.

Relation versus Relevance Theory. A theory of relevance ought to be constructed from within a theory of relations, which means that it must be developed from a theory of systems. However, not all types of relations, relational theories, or systems are appropriate to a theory of

Table 27. Preliminary Classification and Terminology for Relevance.

A. Statics

1. *Relation*: Connection between two objects.

2a. [name]: A relation of non-significance, where that relation is generated through an abiotic event

2b. *Relevance*: A relation of significance, where that relation is constructed by a biotic agent. Includes all types of relevance (*T-Relevance*)

3a. [Non-Representational] *Relevance*: A constructed relation between a non-representational object of significance and any other such object, where the relation is one way and its direction is to an object of significance; i.e., $NR(x) \xrightarrow{R} NR(y)$, where $F(y)$ is an object of significance.

3b. *Representational Relevance*: A constructed relation between any object and a representational object; i.e., $x \xrightarrow{R} Rp(y)$

4a. *Sensory Relevance*: A constructed relation between any factual object and a sensory representation of it; i.e. $F(x) \xrightarrow{R} Rp(y)$.

4b. *Perceptual Relevance*: A constructed relation between any factual object and a perceptual representation of it, which involves sensory relations; i.e. $F(x) \xrightarrow{R} Rp(y)$.

4c. *Memory Relevance*: A constructed relation between any representational object and a stored representation of it and involves perceptual, sensory, and other mental object relations; i.e., $Rp(x) \xrightarrow{R} Rp(y)$.

4d. *Imagination Relevance*: A constructed relation between any representational object and a previously stored representation of it; which involves perceptual, sensory, and other mental object relations; i.e., $Rp(x) \xrightarrow{R} Rp(y)$.

4e. *Conceptual Relevance*: A constructed relation between concepts; i.e., $Rp(x) \xrightarrow{R} Rp(y)$.

4f. *Symbolic Relevance*: A constructed relation between a factual (term) or conceptual object and a factual or representational object, which can involve sensory/perceptual relations and/or other mental object relations; i.e., $F(x)$ or $Rp(x) \xrightarrow{R} Rp(y)$ or $F(y)$, where the second term is derivatively of significance.

4g. *Evidential Relevance*: A constructed relation between a factual object and ultimately a conceptual object (datum or linguistically represented experience) that stands in relation to a hypothesis, where datum and hypothesis are co-referential; i.e., $F(x) \xrightarrow{R} Rp(y) \xrightarrow{R} Rp(z)$.

4h. *Pragmatic Relevance*: A constructed relation between a factual object such as an action or consequence and a representational object such as a goal; i.e. $F(x) \xrightarrow{R} Rp(y)$. Or, a constructed relation between a conceptual object and an action or consequence of an object of significance; i.e. $Rp(x) \xrightarrow{R} F(x)$.

B. Dynamics

1. *Relevance Determination*: (i) A cognitive or non-cognitive act of constructing a relation between an object of significance and at least one other object or (ii) a cognitively or non-cognitively determined construction involving a relation between an object of significance and at least one other object.

2(i) *Relevance Act*: A non-cognitive act of constructing a relation between an object of significance and at least one other object or (ii) non-cognitively determined construction involving a relation between an object of significance and at least one other object.

2(ii) *Relevance Judgment*: A cognitive act of constructing a relation between an object of significance and at least one other object or a cognitively determined construction involving a relation between an object of significance and at least one other object.

a. *Deliberative Judgment*: A judgment represented by language arrived at through a process of reasoning of which the agent is aware because language used to reason makes reasoning evident to the agent.

b. *Intuited Judgment*: A judgment represented by language arrived at through a process of reasoning of which the agent is not aware.

relevance when conceived as a relation of significance. Nonetheless, where the nature of the theory or problem of construction or evaluation concerns connection, then overlap might occur between the two theories and exploration of both types of relations might help elucidate each other.

Relevance versus Determination. A relevance statement specifies a direction of relation, which is from the first relatum to the second relatum. The direction of determination is opposite. Both directions occur in the particular referent system and each is abstracted from it. Thus, relevance is conceptually distinct from determination. However, both are needed in a well-formed relevance statement where the relevance statement identifies the relation of significance and the determination statement provides the justification for it.

Evaluation of Relevance Statements. Evaluating a relevance statement depends on the referential and evidential relations established by the statement. A relevance statement refers to a more specific relational statement that, in turn, refers to a corresponding factual or conceptual system. The direction of evidence/determination is in the opposite direction. Models of a particular referent system or, when possible, a type of system must be constructed and these have a normative function when applied to a statement that is supposed to represent the referent system. If any of objects or relations of the system are not known, readily apparent, or clearly identified and the speaker/writer is not available to elaborate on them, the relevance relation is indeterminate and an evaluative judgment must be suspended.

Theory of Relevance and Argument. An argument is a type of relevance statement of the form 'x is relevant to y', where x and y designate sentences or propositions and the type of relation is inferential. In other words, 'argument' names a term/concept system composed of at least two statements united by a relevance relation. Saying that one statement supports or entails another statement identifies a specific relational term ('supports' or 'entails') subsumed under relevance. Similarly, terms like 'premise' and 'conclusion' or indicators thereof are dual notions united by an implicit relevance relation. Further, 'argument' identifies a category of relational statements that can be constructed about any matter, which means their referents can be any conceptual and/or factual system. As such, the evaluation of an argument is determined by the referent systems to which it is supposed to correspond. That is, arguments, as representational devices of a particular relational form, refer to and are determined by their referent systems. When an argument is factual, both pre-established conceptual systems and pre-existing or predicted factual systems must be taken into consideration. Specifically, both formal and factual truth apply to the construction and

evaluation of arguments. Hence, a theory of relevance includes a theory of argument. Developing the latter is similar to the former except that instances of arguments must be identified, described, and classified rather than any relational statement.

Relations between Relevance, Strength, and Sufficiency. Given that significance presupposes a connection between two objects, where one is an object of significance, the concept of significance differs from relevance only in emphasis. A person might be inclined to emphasise the primary sense of relevance as a connection between two objects and de-emphasise the secondary sense of significance as a particular kind of connection between two objects. Such differences in emphasis can serve a useful purpose in that they permit focus on one sense or the other, providing that such emphasis does not lead to denying or forgetting the other essential sense. Even so, an immediate problem arises when asserting that relevance varies in degree, if that variance is a function of a connection. As we know, a connection between two physical objects can be variable. For example, two boards can be in contact with each other to varying degrees depending on their overlap. However, whether such is the case with objects of a relevance relation is an issue yet to be settled. In contrast, no such issue arises with significance, which clearly varies in degree. For example, oxygen is much more important to me than cream puffs are. Accordingly, given a relevance relation between x and y , where the number of x 's is greater than one ($x_n \xrightarrow{R} y$; $n > 1$), each x can be of greater or lesser significance and, hence, the relevance of an x to y can vary in degree. Further, the strength of a set of x 's is a function of its significance to y relative to the complete set of x 's required to establish y . In other words, like relative frequency, the strength of an x must be determined by comparing it to other x 's as a whole, where the requirements of the whole are determined by y . For example, if y is a human being and the specific object of significance is its survival, the needs of the human create a frame of relevance and it functions to determine what resources (x) are relevant or connected and significant to the satisfaction of those needs. Those resources, like cream puffs and oxygen, can be quantified and their relative magnitudes determined or otherwise ranked if non-quantifiable. Such measures or ranks represent degree of significance or strength as determined by or from the object of significance (y). Without such a comparison, attributing strength would be intuitive, which means the attribution of strength would be a guess, even if dressed up to look otherwise or made authoritatively.

To generalize, I suggest that when significance varies, relevance varies, which indicates an equivalence relation between the two. Significance presupposes connection and the significance of

an x is relative to other x 's as determined by y or the second term of a relevance statement. Further, significance determines strength and overall strength is a function of the significance/strength of individual elements composing the set of x 's. Finally, significance and strength are ultimately a function of the object of significance, which is y .

7.4 Conclusion of this Inquiry

After an initial review of a wide range of the literature on relevance, I concluded that a systematic inquiry into the problem of relevance was needed. In this thesis, I have presented results of that inquiry, which is based on a sample of problem statements, discovery of further problems, identification of the nature of the problems investigated, determination of a suitable framework within which to conduct the study, determination of an approach, and consideration of appropriate information sources. The latter includes relevance statements, dictionary definitions, and accounts of relevance published in the academic literature. Based on analyses and evaluations of relevance statements and dictionary definitions, I suggest that relevance has been conceived largely as a relation of significance. However, relevance does not have to be conceived as such. Further, it is not conceived that way by theorists who define it merely as a relation. Our choice is to determine which conception best suits our epistemic needs.

In either case of conceiving relevance as any relation or a relation of significance, relations of significance must be distinguished from relations of non-significance and respective theories must be developed for each type of relation. They must be distinguished because the two types of relations are fundamentally different. Analogously, the blood system and the lymphatic system are both circulatory systems. Hence, they share common properties. However, they must be distinguished because they are fundamentally different in terms of their composition and specific function. The notion of significance is an important one to recognize in developing a theory of relevance because it characterizes what we paradigmatically mean by relevance and it can be extended to other cases, thereby providing a conceptual connection among them. For example, when I say that the sentience of an organism is relevant to the development of an ethical theory, I assert that such a state is of significance to an epistemic problem of a human being, who is an object of significance in its own right. Other organisms are also objects of significance in their own right, by virtue of their interaction with other objects through acts of consumption, reproduction, maintenance, and defence. Hence, a comprehensive, general theory of relevance must take such

relations into consideration and significance can provide a foundational theme.

Relevance statements are linguistic objects that are representational devices. They function to represent a relation that, under one conception, involves an object of significance. As such, a relevance statement is a symbolic representation of a referent system. Hence, referents of a relevance statement must be taken into consideration to construct or evaluate such a statement. A comprehensive, systematic approach to modelling referent systems is crucial to constructing or evaluating a relevance statement, defining relevance precisely, and developing a general theory of relevance. The general theory that I have provided is partial because it includes only a small sample of statements, definitions, and published accounts. It is provisional in the sense that it is based only on a small sample. Different information can lead to the need to refine or revise the account I have provided. I suggest that researchers continue this effort.

Appendix 1. Definitions of Old Scots Terms Organized by Term and Chronology

Term	Date	Definition
<i>Relev, v¹</i> L. relevāre to raise again, assist.	1375	1. tr. To rescue (a person) from trouble, difficulty or danger; to bring or give aid to by one's action or activity. (In early use, chiefly with reference to help given in battle. Also, to come to the relief of (a besieged garrison). Also fig. in this sense. Also, once, with a non-material thing as object. Also absol)
	1375	2. a. To assist (a person) by donation, or provision of what is necessary; to succour one in poverty or need.
	1375	b. To assist or furnish (with provisions, arms, etc.). Also, without const.
	1508	3. a. To free (a person, community, etc.) from, fra, of (a cause of) mental pressure or distress, or physical pain or discomfort; also with some remedy, etc.
	<1615	b. To free from (fra) a punishment or penalty; to let off.
	1578	c. To be relewit of (an enemy), to be freed of him; to get rid of.
	1497	4. a. To free (person/community) from, of a legal (freq., financial) obligation; to give legal relief; to reimburse
	1574	b. With the amount due (as a fine, debt, etc.) as object: To pay off, repay.
	1521	c. To free from a charge or duty.
	1616	d. To free (land) from (of) a financial burden.
	1540	5. a. To set free (a person, also a bird or ship) (from, out of, furth of, of bondage or captivity). Chiefly Sc.
	1644	b. To set free from a charge or duty (? by supplying a substitute or replacement).
	<1644	c. To free (a pledge) from pawn.
	1698	d. ? To replace one dish by another. Cf. 18th c. Eng., in this sense (1741).
		6. To mak (a need, weakness, etc.) less harmful or oppressive; to relieve or mitigate.
	1400	7. a. To exalt or elevate (a person or thing); to raise in rank, standing or condition.
	1540	b. To restore (a structure or its parts).
	1420	c. To lift, raise up, (? or restore) to (till, in) a better condition.
		8. a. To recover or regain (heritable) land.
		b. To advance, or return, to battle. c. To advance or charge (on an enemy).
<i>Releve, v²</i>	1533	To refer or remit.

Term	Date	Definition
<i>Relation</i> , n L. relātiōn-, f. relāt-, p.p. stem of referre to refer	c1390	1.a. The action of giving an account or narration; recital, report. Also personified.
	1425	b. In legal contexts: A statement by a witness of the circumstances known to him.
	1661	c. To make relation (to, of a matter), to make reference or allusion.
	1425	2. A particular relation, narration, report, or statement; a (or one's) account.
	<1638	3.a. A relationship, correspondence or connection. b. Between (betuixt) things, or of one thing to (unto) another.
	1657	b. Of a person to a place or office.
	?	c. Between (betuix) persons, or of one person to another, specif. d. Kinship.
	1666	e. coll. sing. and pl. (One's) kindred, relations.
<i>Relative</i> , adj F. relatif (13C.) L. relātīv-	1531	1.a. Relating (to a matter or, in grammar, to an antecedent term). b. n. A relative word.
<i>Relate</i> , v L. relat-,p.p. stem of referre Refer v	1631	1.a. tr. To recount; give an account of facts or circumstances known to one before an official examiner.
	1657	b. intr. To be of concern to; to affect.

Term	Etymology	Date	Definition	1 st Relatum	Relational Term	2 nd Relatum
<i>Relevand</i> , adj		1516	Relevant, adj.			
<i>Relevant</i> , adj	Med. L. relevans in relevantes ('legitimi, validi, probantes', 1481 in Du Cange) articuli, f. L. relevāre Relev(e v. l)	1518	Legally pertinent, competent, or sufficient; relevant.		pertinent competent sufficient	
<i>Relevantly</i> , adv		1536	In conformity with correct legal procedures, rules, etc.; with pertinence; relevantly.		conformity	legal procedures legal rule
<i>Irrelevant</i> , adj	OF. irrelevant in same sense. Not in Eng. use till 1786 (DOST).	1558	Said of allegations or pleadings in a law-suit: Not bearing on or supporting the case advanced, not pertinent or applicable, inadmissible.	allegations pleadings	bearing supporting pertinent applicable	case
<i>Irrelevant</i> , n		1559	Irrelevance, irrelevancie.			
<i>Irrelevancie</i> , n.	Apparently not English before 1800.	1558	Want of pertinence, impropriety. (Said of legal pleadings.)	pleadings	pertinence propriety	
<i>Irrelevance</i> , n		1561	Irrelevancie.			
<i>Relevancy</i> , n	Only Sc., f. Relevant adj., with nominal ending conformed to L. type -antia	1575	1. a. The quality or fact of being relevant, in the sense of Relevant adj.			
		1661	b. An objection to an action or defence on the grounds of legal incompetence.	action defence	competence	
<i>Relevance</i> , n		1661	Relevancy.			

Source: DOST

Appendix 2. Identification of Relata in OED Quotations.

Relevant 1. a. Bearing upon, connected with, pertinent to, the matter in hand.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1560 ROLLAND <i>Crt. Venus</i> I. 498	I sall the schaw ane answer releuant.	answer	<question>
1646 CHAS. I <i>Lett. to A. Henderson</i> (1649) 55	To determine our differences, or, at least, to make our Probations and Arguments Relevant.	probations arguments	<issue, decision>
1646 R. BAILLIE <i>Anabaptism</i> (1647) 143	It is very relevant if it were true.	<claim>	<conclusion>
1707 J. FRAZER <i>Disc. Second Sight</i> 15	It seems truly to be founded on relevant grounds.	grounds <premises>	<conclusion>
1782 T. POWNALL <i>Study Antiq.</i> 140	A positive regulation respecting marriage, relevant to a like regulation of the institution of the theocracy.	positive marriage regulation	regulation of a theocratic inst'n
1827 H. STEUART <i>Planter's G.</i> (1828) 78	If we either admit those objections as relevant, or obviate them as unfounded.	objections <premises>	<conclusion>
1851 GLADSTONE <i>Glean.</i> (1879) VI. xxiii. 15	The advantage most relevant of all to the present purpose.	advantage (favoring circumstance)	unspecified purpose
1875 JOWETT <i>Plato</i> (ed. 2) IV. 4	Many things in a controversy might seem relevant, if we knew to what they were intended to refer.	<claims>	issue <conclusion>
1948 D. CECIL <i>Two Quiet Lives</i> II. 140	To learn everything that could possibly be thought relevant to the subject.	<knowledge>	subject
1969 <i>Harper's Mag.</i> Nov. 86	Either we can commit ourselves to changing the institutions of our society that need to be changed, to make them to use a term which I hate 'relevant'..or we can sit back and try to defend them.	social institutions - initial vs later state	<social ideals/norms>
1970 <i>N.Y. Times</i> 1 July 44	Museums should have a more involved or relevant public role.	museums	public role
1976 <i>Listener</i> 20 May 627/3	The ultimate sin of the broadcaster is to keep off the air, because of his political or social prejudices, subjects which are relevant and significant.	socio-political subjects	public broadcasting <public attention>
1978 S. BRADEN <i>Artists & People</i> p. xvii,	What actually makes a work of art relevant to people? It has been said that relevance is achieved when artists meet the real observations of their public.	work of art	real audience observations

Relevancy 1. The quality or fact of being relevant: a. in Law, esp. Sc. Law.

Date/Source	Quotation*	1 st Relatum	2 nd Relatum
1561 Reg. Privy Council Scot. I. 173	Of the law it is requirit to the relevancie thairof that ather of the partis..be relevant in the self, utherwise the hail to be nocht relevant. [To be relevant the law requires that either of the parties be relevant to the legal actions or circumstances; otherwise, a victory will not be relevant.]	<evidence> <allegations>	legal actions or circumstances <principles>
1575-6 Ibid. II. 487	The relivancy of the said allegiance.	allegiance	
1693 STAIR Instit. IV. xxxix. §12 (ed. 2) 665 a **	The meaning of Relevancy (which is more accustomed with us, than else~where) imports the Justice of the point, that is alledged to be Relevant.	point	legal principle
1715 BURNET Own Time VII. (1734) II. 521	Then the Matter of the Charge, which is there called the Relevancy of the Libel, was to be argued by Lawyers.	libel	charge
1786 BURKE Art. agst. W. Hastings Wks. 1842 II. 107/1	The competence, or credibility, or relevancy of any of the said affidavits, or other attestations.	affidavits attestations	<issue/decision>
1818 SCOTT Hrt. Midl. xxii,	The presiding Judge next directed the counsel to plead to the relevancy.	<alleged evidence>	<issue/decision>
1838 W. BELL Dict. Law Scot. 844	The relevancy of the libel is the justice and sufficiency of the matters therein stated to warrant a decree in the terms asked.	libel, case	decree
1883 Law Rep. 11 Q.B. Div. 594	He failed to satisfy me that in a case in which this strict relevancy could not be proved the advocate would not be protected.	object of a case <case>	object of a case <protection of an advocate>

* Definitions from DOST: (i) Requirt: requires; (ii) Ather: either; (iii) Partis: One entitled to a part or share (of something); (iv) In the self: in itself, intrinsically, generated from or having its source in the thing referred to; also, specif., of legal actions or circumstances, requiring no further action; (v) Hail: The winning of a goal in a ball-game. (vi) Allegiance: 1. An allegation or assertion. 2. spec. An allegation of right or title advanced in a court of law, or one implying a charge or accusation against a person. 3. Alleging; citation (DOST). (vii) Libel, n: 1. A formal declaration or missive; 2. a. A leaflet or pamphlet posted up or circulated, assailing or defaming the character of a person or containing scurrilous or treasonable matter. b. A scurrilous, defamatory or treasonable publication; 3. The formal statement of the grounds on which a civil or criminal prosecution is made; a legal indictment. (viii) Libel, v: 1a. To state as grounds for a prosecution or legal action; to specify in a libel; b. intr. To draw up a libel against a particular person, to cite (the person) as defender. c. absol. To take legal action. d. tr. To state the case against (a person), to pursue at law on certain specified grounds. 2. gen. To specify in writing concerning (of) a person. Charge: 5. An injunction, command, or order; a legal summons. 6. An imputation or accusation against a person

** STAIR, Sir James Dalrymple, 1st Viscount. The institutions of the law of Scotland 1681 (also 1693).

Relevant: 2. Sc. Law. Legally pertinent or sufficient.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1561	[see RELEVANCY]		
1644 Maxwell Prerog. Kings 107	If they can make no relevant endictment .against them.	endictment (record, accusation)	persons <acts>
1723 in Maclaurin Argt. & Decis. Cases (1774) 70	[They] find the libel relevant to infer the pains of law.	libel	legal action/retribution
1753 Stewart's Trial 149	[They] remit the pannel, with the libel as found relevant, to the knowledge of an assize.	libel	<legal judgment >
1818 SCOTT Hrt. Midl. xxii,	The defence, that the panel had communicated her situation to her sister, was a relevant defence.	defense	<legal judgment>
1838 W. BELL Dict. Law Scot. 273	The exception of fraud, or force and fear, is not relevant against all actions.	fraud, force, fear	<legal> actions

Definitions from DOST: Action: 1. A legal process or suit against a person or persons; a ground for legal action; a claim at law. b. A charge against a person; a civil or criminal offence. 2. A matter concerning a person or his interests; one's 'cause'. b. A (good or bad) cause. c. A cause, ground, or reason to do something. 3. An act or deed. (The legal sense is earlier, and in Sc. more usual, than the general). Pains of Law: is not defined in SND, OED, and nothing is retrieved from a search through onelook.com, a multidictionary search engine. A google search, however, turns up 67 pages with the phrase and most are from the UK, particularly Scotland. Usage of the term during in the 1700-1800 or concerning that time period indicates that the term means either that the court can proceed to try a case after a preliminary hearing or that punishment is appropriate after conclusion of a trial.

Relevantly

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1561 Reg. Privy Council Scot. I. 180	In respect of the libell relevantlie libellit aganis the said Thomas Kennedy.	libel	<acts of> Thomas Kennedy
1883 Law Rep. 11 Q.B. Div. 601	Parties and witnesses who make statements without malice and relevantly.	statements	<issue/decision>

Irrelevancy

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1592 Sc. Acts Jas. VI (1597) §151	Seeing that diverse exceptiones and objectiones risis vpon criminall libelles..be alleged irrelevancie thereof.	exceptions/objections of criminal libels	<issue/decision>
1802-12 BENTHAM Ration. Judic. Evid. (1827) IV. 576	In the following modes of collection..the plague of irrelevancy is in a manner unknown.	collection mode	
1833 LAMB Elia, Pop. Fallacies ix,	The utter and inextricable irrelevancy of the second [member of the question].	member of a question	
1876 MOZLEY Univ. Serm. i. (1877) 7	To use the weapons of one of these societies against a sin or error in the other society, is a total irrelevancy and misapplication.	a kind of weapon from one society <regulation and/or act>	sin or error in another society

Relevance: Relevancy; pertinency to important current issues (as education to one's later career, etc.); social or vocational relevancy.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1733 INNES View Laws Scot. 11	The Relevance being determined,..the Probation proceeds in the next Place.	probation	<issue/decision>
1865 LECKY Ration. (1878) II. 98	The main principle upon which the relevance of this species of narrative depends.	species of narrative	
1890 Spectator 19 Apr. 536/2	What relevance had such a fact to the duty of the hour?	fact	duty of the hour
1949 Poetry (Chicago) Feb. 299	Tate holds that the poem is autonomous, and that the only relevance the subject-ideas have is to each other within the formal meaning of the work itself.	subject ideas of a poem	subject- ideas of a poem
1955 Bull. Atomic Sci. Apr. 126/1	Relevance is another one of these non-assessable quantities which circumstances require to be assessed.		
1970 Time 30 Nov. 40	The impetus came largely from student demands for 'relevance', especially for the overdue admission of more minority-group students. Activism has also done much to curb the old absurdities of trivial research and needless PH.D.s.	1. admission of minority students 2. Research PhDs	1. ?? 2. <Genuine problems>
1975 Language for Life (Dept. Educ. & Sci.) ix. 129	We have heard the case for 'relevance' carried to the point of excluding fantasy or any stories with settings or characters unfamiliar to the pupils from their first-hand experience	fantasy or stories with settings or characters not experienced first hand by students	<early child education>
1975 Times 12 Feb. 11/7 Hal [sc. a novel]	while laudable in its social intentions is little more than a piecing together of stock responses to the current demand for 'relevance'.	stock expressions	<social benefit>
1977 Chem. in Brit. Mar. 105/3	It may seem anomalous in these days of 'relevance' philosophy in tertiary education that the average student of chemistry gets little inkling from his teachers..of the vast practical importance of disperse systems in industry.	disperse systems in industry	chemistry education
1978 New Scientist 21 Sept. 850/2	'Relevance' in research implies both social efficacy and psychic commitment by the research worker.	scientific research	social efficacy researcher's psychic commitment

Definitions: *of the hour* : A. enjoying the highest degree of relevance, importance, or popularity at the current moment or particular time (Encarta) B. A definite time in general; an appointed time; an occasion. spec. of the hour: of the present hour, of the very time that is now with us; as in 'the question of the hour' (OED)

Relevant 3. Relieving; remedial. Obs. rare.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1730 BAILEY (folio)	Relevant, relieving.		
1762 ASTON in Burke's Corr. (1844) I. 38	They ever pursued vindictive rather than relevant measures.	measures	<legal remedy>

Irrelevant : Not relevant or pertinent to the case; not to the purpose; that does not apply: said orig. of evidence or arguments.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1786 BURKE W. Hastings Wks. XI. 455	All or most of which [depositions] were of an irregular and irrelevant nature, and not fit or decent to be taken by a British magistrate.	dispositions	<issue/decision>
1789 BELSHAM Ess. II. xl. 505	They are manifestly irrelevant, and totally foreign to the..argument.	<premises>	argument
1799 MRS. J. WEST Tale of Times I. 152	The above observation..is..irrelevant to the case before us.	observation	case
1823 LAMB Elia Ser. II. Poor Relation,	A Poor Relation..is the most irrelevant thing in nature.	poor relation	<other person related.>
1838 THIRLWALL Greece xxxii. IV. 239	He enters into a history of his early life, which..is wholly irrelevant to the proper question.	personal early history	question
1877 E. R. CONDER Bas. Faith ii. 79	No accumulation of facts can establish an irrelevant conclusion.	factual statements	conclusion
1883 Law Rep. 11 Queen's Bench Div. 595	The words complained of..were irrelevant to the proceedings before the police court.	words	proceedings

Relevancy 1. The quality or fact of being relevant b. General Use

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1826 Sheridaniana 49	His answer..would thus come with more relevancy and effect.	answer	<question>
1839 HALLAM Hist. Lit. II. vii. §3 note	It is of no relevancy to the history of literature.		history of literature
1878 SIMPSON Sch. Shaks. I. 95	His Irish enterprise had lost its appositeness and relevancy.	a person's Irish enterprise	
1961 Jnl. Physical Chem. LXV 317/1	We are reporting these investigations..because of their relevancy to problems of the study of apparently simple exchange reactions of chlorine.	report of investigations	study/problem of simple exchange reactions of Cl
1980 Times Lit. Suppl. 30 May 609/2	A tendency to confuse relevancy with recency.*		

* This is not a relevance assertion. Rather, it is remarks on a condition that may be associated with a relevance statement. The claim is either that recency itself is insufficient to demonstrate relevance or the concepts 'relevancy' and 'recency' are disjoint.

Irrelevantly adv., in an irrelevant manner, not to the purpose.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1818 in TODD. 1821 LAMB Elia Ser. I.	All Fools' Day, It will come in most irrelevantly and impertinently seasonable to the time of day.	All Fool's Day	time of day
1894 Chicago Advance 18 Jan.	'I suppose Mr. Morrison has returned', she remarked, rather irrelevantly, as it seemed to Maud.	remark	

Irrelevance: The fact or quality of being irrelevant, want of pertinence; with an and pl. an irrelevant remark, circumstance, etc.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1847 L. HUNT Men, Women, & B. III. xii. 357	All her wit is healthy; all its images entire and applicable throughout not palsy-stricken with irrelevance.	wit <facial expression>	
1872 W. MINTO Eng. Prose Lit. I. i. 64	A second irrelevance foisted in upon the back of the first.		
1873 'F. TRAFFORD' (Mrs. Riddell) Earl's Prom. II. 123	'I am going away', began Grace with apparent irrelevance.	statement	

Relevant 1b. Correspondent or proportional to something.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1868 ROGERS Pol. Econ. viii. (1876) 76	Population and the supply of food must be exactly relevant.	population	food supply
ibid. xiv. 191	The value..is absolutely relevant to the demand for them.	value of an unspecified item	demand

Irrelievable Not relievable, that cannot be relieved.

Date/Source	Quotation	1 st Relatum	2 nd Relatum
1670 H. STUBBE Plus Ultra 67	Violent impressions..upon the membranes of the Stomach, which may introduce an irrelievable distemper in..that part.	1. something that can cause violent impressions. 2. State of stomach membranes (distemper) at time t .	1. Stomach membranes 2. State of stomach membranes (distemper) at time $t+1$.
1797 F. HARGRAVE Juridical Argts. I. 16	Gross as we must confess the case to be, it is irrelievable.	2. State of case at time t .	2. State of case at time $t+1$.
1849 KINGSLEY Misc., N. Devon II. 266,	I never think, on principle, of things so painful, and yet so irrelievable.	State of things (in pain or generating feelings of pain) at time t .	State of things (in pain or generating feelings of pain) at time $t+1$.

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