CHAPTER TWO

Initial Definitions and Preliminary Clarifications

Data and sources

This chapter presents the definitions and premises required for constructing Source Theory, including the Source Calculus presented in the following chapter. So as to avoid burdening the reader at the beginning of the book, I have placed the more detailed discussions in the appendices.

A **datum** is an information unit. In a human context, it is an object of the mind that is grasped by an individual and changes that individual's epistemic state when it enters his or her mind. One could say that, in this latter context, a datum is a "thought", in the broad, Cartesian sense of the word. That is, it is anything that can be the object of sensory perception, thinking, asserting, belief, disbelief, or any other epistemic attitude. For the purposes of Source Theory, a datum will always appear in the form of a sentence.

Note 1: For the purposes of Source Theory, a datum is always conscious. Although an unconscious datum can affect a person in many different ways, it cannot be "thought" (in the Cartesian sense), and so it does not change its owner's epistemic state. Therefore it cannot be the object of sensory perception, thinking, asserting, belief, disbelief, or the like.

Note 2: Even though data will appear hereinafter only as sentences, in principle, data are not necessarily propositions, but can be mere objects. A sensual presentation is a datum, and so is a social act. Furthermore, linguistic expressions of data are not necessarily sentences, but can also be words or phrases. For example, not only is "The tower is high" a datum, but so is "a high tower" (I discuss this point at greater length in Appendix I). When dealing with the Source Calculus (in the following chapter), however, we will assume for simplicity that data are propositions, and since the calculus deals with linguistic

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expressions, we will treat the propositions as sentences. In general, our informal discussion will keep in mind that data are not sentences, but the formalist course of argumentation will be limited to those data whose linguistic expressions are sentences. This provides another reason for limiting ourselves to conscious data, since unconscious data are not expressed in sentences.

A **truth source**, or a **source** for short, is an object that supplies a datum. In the human context, a source can be one of the human senses (including introspection), reason, testimony (a person or a text), and the like.

Note: "Testimony" in this context refers to any data whatsoever, and not only to data relating to matters of fact. Thus, a person can attest to a law of logic and a text can attest to a legal obligation, and so on. (Testimony as an epistemic source has recently gained much scholarly attention. See for example: Coady 1992; Dummett 1994; Audi 1997; Lackey and Sosa 2008; Lackey 2008; most of these works, however, focus mainly on questions regarding its justification, which are not at the center of my discussion).

The act of supplying a datum will be called **transmission**. A transmission is carried out if someone might receive it, regardless of whether there actually is a receiver and, if there is, whether the receiver believes its content. Therefore, the existence or nonexistence of the receiver, or the belief or disbelief of the receiver in the transmitted datum, is not an important element in Source Theory, unless the receiver transmits the datum forward. However, if the receiver does transmit the datum further on, thus serving as a source, he thus attests to the truth of that datum, and asks its next receiver to believe it.

Note: Every new transmission is the transmission of a new datum, even if it was already in the receiver's mind, since bringing it up again makes it new. This is true not only for data that have been forgotten and are brought back into memory, but also for the renewal of the very same datum at every moment. Moreover, even the phenomenon of forgetting is itself the transmission of a new datum, since it leads to a condition of absence (this is discussed at length below and in Appendix II).

The basic assumption of Source Theory is that **every datum has a source.** Phrasing this in terms of sentences, it means that a sentence is not uttered in a vacuum; there is a source that transmits it, thus declaring that it is true. A datum cannot exist without a source. In contrast, a source qua object can exist without transmitting any data, but in that case it will not be considered a source.

A **database** is the set of all the data transmitted from a given source or source model (interrelated sources; see below).

A source can transmit a datum directly or indirectly. It transmits it directly when the content transmitted is about the world itself; it transmits it indirectly if the content transmitted is about the fact that a certain source has transmitted a certain datum.

The directly transmitted data are usually transmitted by the sources which we may call the **basic cognitive tools**. There are different views about what these sources are, but the differences are not deep. Descartes enumerated

"understanding, imagination, sense and memory" (Descartes 1934: 35); Thomas Reid mentioned "consciousness, memory, external sense and reason" (Reid 1854, Essay VI, Chapter Four: 439); Chisholm, who cited these two philosophers, wrote in agreement with them: "(1) external perception; (2) memory; (3) self awareness (reflection, or inner consciousness); (4) reason" (Chisholm 1977: 122) In my discussion of the human context I will follow the same path, but first I would like to treat this issue more analytically and begin by investigating the functional nature of the sources.

A source can **adopt** another source, either conditionally or fully. A **full** (or **unconditional**) adoption of source b by source a takes place when source a accepts all the data transmitted by source b as true. A **conditional** (or **partial**) adoption takes place when source a accepts the data transmitted by source b as true only if some condition holds (whether it involves the source, the datum, or anything else), and the fact that it does hold is transmitted by a source adopted by source a. This condition will be called **the adoption restriction condition**.

A source can also **reject** another source, either conditionally or fully. A **full** (or **unconditional**) rejection of source b by source a takes place when source a takes all the data transmitted by source b as false. A **conditional** rejection takes place when source a takes the data transmitted by source b as false only if some condition is satisfied, and the fact that it is satisfied is transmitted by a source adopted by source a.

The idea of adoption gives a new meaning to the concept of **belief**, which has always been central to modern epistemology. A belief in a datum is an act that reflects the adoption of the source that transmitted that datum. There is no belief without adoption, and every belief is nothing but the direct modus-ponens-like consequence of the adoption of a source and the transmission of a datum by that source. The belief is evinced by the fact that the adopting source now transmits the same datum.

The idea of adoption also gives a new meaning to the concept of **justification** of belief, which has been no less central than the concept of belief itself. The final justification of all belief is the adoption of the source that transmitted it, or the source(s) that transmitted the data which support it (this disputable claim will be discussed and better proven in Chapter Three below).

A source can adopt more than one source. This means that it accepts the data transmitted to it from these sources. When there is more than one adopted source, each of them is adopted for another type of data. This determination will be called the **division of labor** among the sources. Any two or more sources, together with the division of labor among them, constitute a **source model**. The main source models we discuss are types of compartmentalization, and these are defined below.

In the human context, a person's source model is what constitutes his way of thinking.

A source model together with the data transmitted by its sources is called a **truth system**, or, for short, a **system**.

The types of data

According to the definition of a source, it is an object that transmits new data to their receivers. Thus we can say that sources "produce" data for the receivers. Since sources create data in different ways, we can call each of these ways a **creative function**. A creative function is the relation between the input to the source and the output it produces. I first present the types of creative function *in abstracto*, and only then discuss them in the human context.

A **positive datum** is one that changes a person's epistemic state by adding new content. Most of the data we will discuss are of this type. As mentioned above, for the purposes of Source Theory, a positive datum will be represented by a sentence. Usually I will use atomic sentences, but a conjunction of sentences can also be considered a single datum.

However, there is also another type of datum that I will call a **null datum,** which is actually a non-existent datum. I call it a datum because the absence of information about a certain issue is also a factor that helps determine a person's epistemic state. When you ask a person what his grandfather's birthplace was and he says "I don't know", he possesses a datum, not only about his own knowledge but also about his grandfather's birthplace – but a null one. If he now learns the answer, we will say that the newly acquired positive datum replaced his null datum.

Creation *ex materia* and *ex nihilo*. A source can create a new datum either out of a datum that already exists in the system or with some other origin. Creation of the former type will be called ***ex materia***, and from the latter type, ***ex nihilo*** (these are sometimes referred to in literature as the outcomes of **generative** sources). This terminology is somewhat misleading, as the source that creates a datum ex nihilo does not actually create it out of nothing; it may create it out of the external world or any other origin outside the system, but this origin is out of our reach and far from our interests. In terms of Source Theory, the datum is not created out of any previous datum within the system. The creation is ex materia only when both the input and the output are within the system.

Let us call the null datum 0, and the two different positive data p and q. The possible combinations of the major creative functions are as follows:

1. 0 is the input and 0 is the output.
2. 0 is the input and p is the output.
3. 0 is the input and q is the output.
4. p is the input and 0 is the output.
5. p is the input and p is the output.
6. p is the input and q is the output.
7. q is the input and 0 is the output.
8. q is the input and p is the output.
9. q is the input and q is the output.

If we analyze this list we can easily see that from a combinatorial point of view 2 and 3 exemplify the same function, that of creation ex nihilo; 4 and 7 exemplify the same function, that of turning a positive datum into a null one; 5 and 9 exemplify the same function, that of preserving the datum as it is; and 6 and 8 exemplify the same function, that of creating one datum out of another one, i.e. creation ex materia. The only function that is logically dubious is no. 1, but it is epistemologically less interesting and we can therefore ignore it for the moment (but see Appendix III for some thoughts about it). Thus, we can speak about four chief functions, which we will number F1–F4:

F1: creation ex nihilo
F2: creation ex materia
F3: preservation
F4: elimination

In the human context, F1 appears in sensation, including reflection; F2 appears in reasoning and judgment; F3 appears in memory (I was not convinced by Lackey's arguments for seeing it as a generative source – Lackey 2008: 251–277 – and agree with Audi 1997: 410 and Dummett 1994: 226); F4 appears in forgetting (a faculty often neglected by modern epistemology; see Appendix II for a more detailed discussion).

These functions involve propositions, not objects, because Source Calculus refers to propositions; but, as stated above, this choice was made for convenience alone, while I do not believe that there is a philosophic need for a sharp logical distinction between the two. Thus I will only discuss objects briefly here, and will develop my argument about them elsewhere.

Objects are of two kinds: individual and general. In principle, only individual objects should be called objects, but we will use the word here for both types. General objects are properties or relations, i.e. predicates, and can be of different levels of abstraction.

According to classical empiricist philosophy, sense data objects are created ex nihilo (in the sense defined above), while predicates are created ex materia from them; according to some rationalist philosophers, the opposite is the case.

The functions that hold among objects are the following:

F5: **Abstraction** develops predicates from individuals (or predicates that determine individuals) to general predicates and from lower predicates to higher ones.

F6: **Judgment** determines that a predicate is attributed to an individual and that a lower predicate is subordinate to a higher one.

Of the many predicates that can exist, one relation deserves special attention, because of its basic character, namely, the part-whole relation. Determining this relation requires one of two faculties that have not yet been mentioned, and so have not yet been named:

F7: The **partitionary** faculty is responsible for conceiving wholes as divided to parts.
F8: The **combinatory** faculty is responsible for conceiving objects as parts of a whole.

Physical objects are partitioned into real parts; while combining two predicates leads to the creation of a predicate that includes both of them as disjuncts, as shown in Venn diagrams.

In fact, abstraction occurs when two or more predicates are combined and a new concept is assigned to the new predicate.

Imagination, a faculty mentioned Descartes's and Reid's lists as cited above, is nothing but a use of the combinatory faculty to combine two parts which are not combined into one whole in the world conceived by the senses and reason.

These functions can also be used for propositions. Thus, for instance, when a person sees green grass (a datum created ex nihilo) he may judge that "the grass is green"; he can now divide the grass to its parts, and judge that this blade and that blade are green; he may now make use of abstraction and generalize that "all the blades are green" (datum created ex materia). He can also determine that the property 'green' is a part of the property 'colored', as every colored thing is either green, blue, red, yellow or the like, and so the grass is also colored.

The creation of data, whether ex nihilo or ex materia, requires sources. The question of which human organ is responsible for each of these functions is a scientific one, and is not a part of our present concern. Viewing epistemic systems as information systems on a purely theoretical level, we may hold that each type of function requires a source of its own, even if empirical research tells us that in the human context there are organs which carry out more than one function and organs which carry out fewer than one function. In the human context, however, the faculties mentioned above constitute our basic cognitive tools.

Having discussed the nature of sources and data, we must now consider the degree of trust we have in them and the degree of justification of this trust. To consider this issue we first make use of a rigorous formal method and present our discussion through what I call **the formalist line of argumentation**. Afterwards we consider it from a different angle, through what I call **the pragmatist line of argumentation**.