

Anchoring scientific abstractions – ontological and linguistic determination following socio-instrumental pragmatism

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Abstract:

The paper addresses the problems of scientific conceptualisation in order to avoid diffuse abstractedness. It proposes the use of an ontology consisting of the following categories: 1) humans, 2) human inner worlds which consist of 2a) intrasubjective parts and 2b) intersubjective parts (shared knowledge and social institutions), 3) human actions, 4) symbolic objects (signs), 5) artefacts (artificially made material objects) and 6) natural environment. This approach also includes a reflective way of using language. Words and corresponding language games are investigated in order to clarify the scientific concepts.

Keywords: Ontology, category, language use, conceptualisation, pragmatism

1 Introduction

During the last decades there has been heavy criticism against positivistic strategies in social science studies (e.g. Guba & Lincoln, 1989). There has been criticism against narrow-sighted and deterministic constructs. Theorising which follows and includes such constructs often lead to simplistic explanations. Usually, post-positivistic studies offer concepts with more semantic richness and greater social sensitivity. There are, however, problems in the traces of post-positivism. Many concepts seem to be very abstract and thus unclear. Such concepts represent a diffuse and fluid ontology. Many modern scientific texts concerning societal issues can be very illuminating, but they can also leave the reader with a vague sense of uncertainty: "What does the author really mean?"

In a spirit of a self-critical post-positivism, this paper addresses the problems of abstractedness in theories and categories in social science. A need for anchoring concepts and abstractions is recognised. Such anchoring should not be done yielding to "operationalisation of measurable variables".

Proposing and using concepts in scientific reasoning means "talking about the world". To do this in a reflective way there is need for a pre-understanding which should consist of a reflective stance concerning *the world* talked about and *how we talk about* the world. Conceptualisation should be founded on a proper *world view* (ontology) and a proper *language view*. The purpose of this paper is to suggest an *ontology* to be used as a basis for scientific conceptualisation combined with a *way of using the language* in a reflective way. I call the ontology "socio-instrumental pragmatism" since it emphasises humans acting, with the support of instruments, in a social world. The view on language use is mainly inspired by works of Ludwig Wittgenstein (1958ab).

The world view and the language view together give implications for how to work with scientific concepts in order to be clear to oneself and to others. Following the world and

language views I suggest an *approach as how to work with conceptualisation*. This also involves a view on quality criteria for scientific concepts.

I formulate this approach based on my own background and interest, i.e. sciences concerned with organisations and the use of IT artefacts. This is supposedly not a limit for its applicability. I think that most social sciences can benefit from this approach when developing and evaluating categories and theories.

2 A socio-instrumental pragmatist ontology

2.1 Background

Researchers have high ambitions. They want to describe and explain complex phenomena in society. Many scientific texts often seem to deal with complex categories and complex relations. It is an obvious tendency in scientific presentations to strive for generalisation and abstraction. Scientific categories tend to have a broad coverage of phenomena. As said above this can sometimes leave the reader with an uncertainty about the concepts used. What designates these concepts?

Before one can understand and describe the complex, one must first grasp the simple. From an understanding of what is simple, one can build more complex conceptual structures. This has been very clearly stated by Wittgenstein in his Blue Book: "...we shall with great advantage look at primitive forms of language in which these forms of thinking appear without the confusing background of highly complicated processes of thought. When we look at such simple forms of language the mental mist which seems to enshroud our ordinary use of language disappears. We see activities, reactions, which are clear-cut and transparent. On the other hand we recognize in these simple processes forms of language not separated by a break from our complicated ones. We see that we can build up the complicated forms from the primitive ones by gradually adding new forms." (Wittgenstein, 1958a p 17).

I will follow this view of Wittgenstein which I summarise in a maxim with this formulation: *First we must understand the simple. Then, and only then, is it possible to continue and grasp the complex!*

An ontology for social science must thus start with simple and clear-cut phenomena. In the next section I present this ontology as realms of the social world. This is an ontology to be used as a fundamental framework for conceptualising and theorising. I have named this approach *socio-instrumental pragmatism* (SIP). Pragmatism means an emphasis on actions. We are, however, not mainly concerned with isolated human actions. Instead the main interest for social sciences is on actions directed towards other persons, i.e. social actions. When people act they often use material or immaterial instruments. We are thus interested in socio-instrumental actions.

The socio-instrumental pragmatist framework has been presented earlier in Goldkuhl (2001), Goldkuhl et al (2001) and Goldkuhl & Ågerfalk (2002). It has not earlier been as sharply presented as different ontological categories as it will be below, except from Goldkuhl (1999) which is a preliminary precursor in this respect. SIP can be seen as an eclectic framework inspired by social action theories (e.g Giddens, 1984; Habermas, 1984), pragmatic knowledge theories (e.g Dewey, 1938; Schutz, 1962; Berger & Luckmann, 1967), pragmatic language

theories (e.g Wittgenstein, 1958ab; Searle, 1969; Habermas, 1984; Halliday, 1994) and social artefact theories (e.g Norman, 1988; Latour, 1992).

2.2 Realms of the world

There are fundamental differences between what we call the natural world and the social world. A social scientist meets a pre-defined world. There are already meanings in the social world (e.g Schutz, 1962). Much of the “substance” of the social world is meaningful. In this world there are humans acting and results of actions as external objects (signs and things). Such external objects are created and designated with expressions of meanings and thus possible to interpret (assign meanings to) by their creators and other humans.

In my socio-instrumental pragmatist ontology I work with some basic ontological categories. I talk about different realms of the world. These different categories are related to each other and sometimes partially overlap. The basic categories help us to talk about the social world in a structured way. When constructing scientific concepts there must be a clear link to the world and more specifically to delineated parts of the world. The ontology should not be interpreted as a “total” description of the world. It is to be seen as a conceptual instrument; a generic conceptualisation of the world to be used for further more specific conceptualisations.

The primary participants in the social world are *human beings* (1). A human acts in the world based on meanings he attaches to the world and his role in the world. There is an *inner world of humans* (2), which consists of their knowledge about themselves and the external world. This also includes plans, intentions and other action dispositions. Giddens (1984) makes an important distinction between human’s practical and discursive consciousnesses. I acknowledge these parts, but do not consider them as completely separate, but rather as partially overlapping. The inner world of a human is of course to be seen as a part of a human. Anyhow I treat it here as a basic ontological category. This is done because we can speak of something as being a part of human inner world. Something can be *located* in the inner world of a human (e.g. his conceptions about the world).

Human actions (3) are also parts of humans. I treat them also as a separate ontological category. Human actions can be overt, i.e. such actions usually make *interventions* in the external world (3a). Human actions can also be covert. Covert actions can be interpretative actions where a human tries to make sense of something externally (3b). They can also be conscious acts of thought and reflection while trying mentally to solve a problem (3c). A covert action is at the same time part of human inner world; thus this is also an overlap between ontological categories. A covert action (*interpretation* or *reflection*) goes internally, from external world to subjective world. It tries to make changes in the inner world of a human. It is an attempt of a human to change his knowledge about something. An interventionist action goes externally - from human to external world - and it tries to make changes in the external world. What does such an external world consist of besides other human beings?

I make a distinction between the following ontological categories: *Symbolic objects* (4), *other artificial objects* (5) and the *natural environment* (6). These are three ontological categories. Anyhow, many external objects can belong to more than one external category. This will be explained and shown below.

Human interventionist actions leave traces in the external world. The purpose of many actions is actually that there should be a manifest result of the action. This goes for both

communicative and material actions; confer Goldkuhl (2001) about meanings of and similarities and differences between these two types of actions. Communicative actions can be oral (someone says something) or written (someone writes something). In the case of speech, the result is an utterance, which is an impermanent result of sound character. It disappears as such after its pronunciation (if it is not recorded by any audio equipment). It leaves effects in the memories of the person present, but this is something different than the utterance itself. A written message is permanent, at least for some time. It has a prolonged existence in the external world. People can read it several times and it will still be there until it is destroyed intentionally or unintentionally.

Material actions give rise to material objects or changes in such objects. Examples of such material objects are cars, clothes and dishes. In this ontology I have made a distinction between symbolic objects (signs) and other artificial objects (artefacts). Symbolic objects are results of communicative actions. Such symbolic objects can be utterances, texts or other signs. Symbolic objects are objects where the *signifying properties* are of primary importance. Material actions give rise to what I here call other artificial objects (things, artefacts, utility goods). For such objects the *constructed material properties* are of primary importance. It is not what the objects tell us (as in the case of symbols/signs) but what we can perform in a material sense.

The words “artificial” and “artefact” are problematic here. There is a distinction between natural objects (as parts directly of nature) and artificially produced objects. Such artificial objects are created by humans (in contrast to natural objects) and they can be symbolic (4) or material (5). All such objects could thus be called artefacts. This is also what is done by many scholars. I have however reserved the word “artefact” to the ontological category (5), i.e. other artificial objects. These are things, which are not symbolic and not natural but of material character and artificially made. They resemble with signs in the sense that they are both artificially and purposefully created and they resemble with with natural objects since they are material and emanates from natural stuff. This ontological category (5) needs a class name, and I will mainly use the term “artefact”. The attribute “artificial” is used to denote artefacts as well as symbolic objects, since they both are artificially made.

Another problematic issue is that signs and artefacts in some senses are both material and informative. A text may be written on a piece of paper. This means of course that it is material and that it has material properties. As an external object it must have an material existence otherwise it would not be an external object. But what is essential with texts is that they have signifying properties. Their main function is to convey meaning, i.e. to be informative. An artefact, on the contrary, is used to perform material acts by virtue of its material properties. An artefact is constructed to have certain material properties and these properties are of decisive importance for its successful use. One can talk about informative properties of artefacts. In order to use artefacts it is necessary for humans to understand how they are used. Simply by looking at an artefact, one needs to comprehend something about how to make use of it in action. More advanced artefacts, like cars, usually have built-in symbols (e.g. manœuvre panel) in order to facilitate its use. Often different components of artefacts are designed in ways that make it easy to comprehend from their pure appearance how to use them (Norman, 1988). This means that artefacts, besides their primary material properties often have informative properties. Such informative capacities can be either explicit signs or implicit by e.g. the shape of some part of the artefact.

Information handling artefacts, like computers, are special since they can be seen as mixtures of artefacts and signs. One can call them sign artefacts (Goldkuhl et al, 2001), since they consist of signs but their material properties go far beyond simple paper documents. There are many important material properties of computers which enable humans to handle information in sophisticated ways.

I return to the ontological category (2) of human inner world. The inner world of a human is a subjective world to which he has privileged access (Berger & Luckmann, 1967). Parts of this world can be shared with other people in the sense that what is known by me is not only known by me but also by somebody else (Schutz, 1962). The existence of such common knowledge makes it meaningful to talk about an *intersubjective* part of the human inner world (2b). When we talk about language, routines and other social institutions we refer to such an intersubjective part of the world. Far from all parts of a person's inner world can be seen as intersubjective. There always exist large parts which are *individual* and *intrasubjective* (2a) due to the person's own biographical experiences and privileged access to his own consciousness (ibid).

The intersubjective part of a human inner world consist to a great degree of social rules, norms and linguistic conventions. It also consists of other kinds of social institutions like knowledge of methods and routines. The large existence of such rules have consequences for how people interpret such an intersubjective world. It becomes tangible and even inflicting in ways that it seems independent of individual humans. The social character of all such rules make them "objective" in ways that people sometimes tend to forget their human origin. The rules can become reified when people treat them as naturally given entities (Berger & Luckmann, 1967). I mean that it is adequate to describe such rules as independent of individual bearers. But such rules must, in order to be sustained in society, be used by acting human beings continuously and thus be parts of their practical consciousness (ibid). They cannot exist purely beside or outside humans. Reification is a human mistake, when we forget that rules and norms are socially constructed and that they must be part of human inner worlds. I acknowledge the existence of such rules outside humans as actions and signs. This will be further treated below in section 2.3.

The different parts (ontological categories) of the world are depicted in figure 1 below. It is important to note that there exist sub-categories of these categories. There are different characterising categories (properties) related to the main categories. I also include active processes within artefacts and natural objects. E.g mechanical and electric processes within artefacts make them active.

The different ontological categories are summarised below:

1. Humans
2. Human inner worlds (knowledge, intentions, emotions etc)
 - 2a. Intrasubjective part (individualised)
 - 2b. Intersubjective part (shared knowledge and social institutions)
3. Human actions
 - 3a. Intervention-as-action (communicative or material actions)
 - 3b. Interpretation-as-action
 - 3c. Reflection-as-action
4. Symbolic objects (signs)
5. Artefacts (artificially made material objects and their processes)
6. Natural environment (objects and processes)

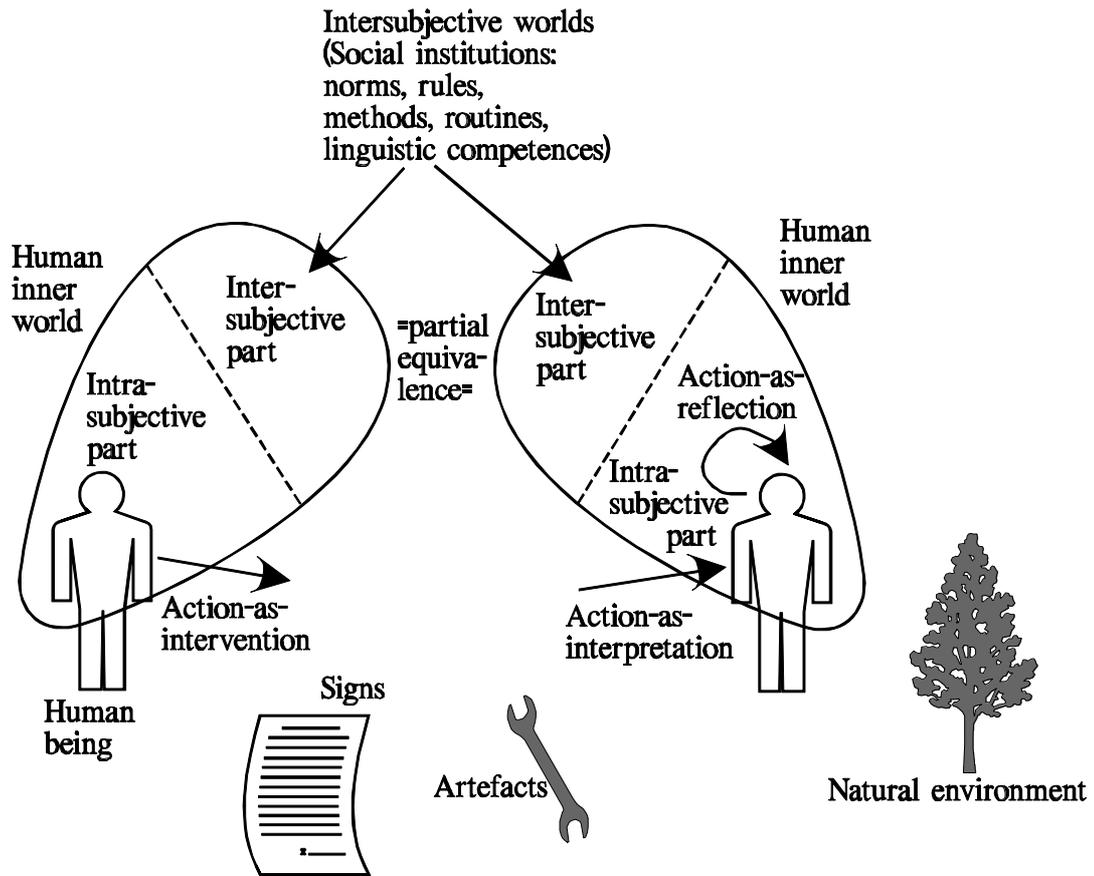


Figure 1 Different realms of the world (SIP ontology)

2.3 Implications for conceptual development

One core idea of this ontology is that phenomena have locations. If they exist, they exist somewhere in the world. Besides the fundamental ontological question “*What kind of phenomenon is this?*”, there is a need for a supplementary ontological question “*Where does this phenomenon exist?*”. Conceptualised phenomena must exist somewhere. The division into realms (as proposed in this ontology) is also a determination of principle places of phenomena. It must be possible to give a proper answer to the supplementary ontological question “*Where does this phenomenon exist?*”.

What I propose is that the SIP ontology should be used as a basis for conceptual classification. When you try to introduce a new category, you should classify this category according to this ontology. Do you speak of human actions, a social institution (an intersubjective phenomenon), a symbolic object or an artefact? This will help you to be clear about what you really mean. But is this not a reductionist position? Is it not an approach giving too simplistic concepts if we try to reduce everything to be one of these ontological categories? Does it not exist any phenomenon outside of these realms?

I am not against complex categories. I do think that we need complex categories to conceptualise and explain complex phenomena. But what I claim is that the construction of such categories must start with clear and simple abstractions.

Many social phenomena are “*multi-existing*” phenomena. In some sense they exist within different realms at the same time. Let me take one example: Business strategy. What kind of phenomena is a business strategy? Where does it exist? I claim that if something is a business strategy it must exist as an intersubjective phenomenon (2b). It must, within a company, be shared between different persons (in their minds). But this is not the only place where it exists. Probably the business strategy is written down and thus given a linguistic form. It is thus also manifested as an external symbolic object (4). This means that a business strategy exists within two realms. This makes such a phenomenon complex. First, all intersubjective phenomena are complex since there can be slight or large differences between different bearers. Second, there might also be differences between the linguistic manifestation and the human conceptions. Another matter that makes the picture even more complicated is that a business strategy is a pragmatic phenomenon. One main purpose of a business strategy is that it should govern human actions within a company. The business strategy can be instantiated in human action (3). And there may also be consequences of such actions of material (5) and linguistic (4) character and also directly on humans (1, 2). We can thus talk about “business strategy as action” and “consequences of business strategy”. These other phenomena are clearly related to the phenomenon of a business strategy. E.g actions and consequences will act back on business strategy conceptions and thus influence and change them. To inquire and theorise about business strategies one must probably deal with all these phenomena and realms.

I think that, what I have here exemplified with business strategy, also goes for many other social phenomena, at least phenomena related to work in organisations. Instead of business strategy one can think of many other business phenomena like organisation structure, standard operating procedures, quality control methods, system development models, design methods. They all tend to exist within different realms. I claim that many such phenomena actually are socio-instrumental and pragmatic objects. They are social since they must be intersubjectively shared between different humans in their minds. They are pragmatic objects since they are intended to be transformed into actions. They are instrumental in several senses; confer Goldkuhl (2001) about different interpretations of instrumental. Usually they are linguistically codified in documents (signs as instruments). As pragmatic objects, they are conceptual instruments for action. Sometimes these phenomena are also manifested in artefact form (as support or consequence).

3 Conceptualisation as language use

Above I have described categorical principles of *the world* talked about. I will now turn my interest to *the way we talk about* the world. It is not enough just to have a reflective stance towards the world when developing categories. We need also to be aware of the role language plays on our way of conceptualising.

Different scientific concepts are always linguistically codified. We give them a linguistic form. We label a concept with a particular word or word combination in order to designate what we are meaning. But words are not just words. There are classes of words which stands for both different kinds of phenomena and different ways of using the language (Halliday, 1994).

In the spirit of Wittgenstein’s later view on language I recommend an investigation of the linguistic nature of different concepts (Wittgenstein 1958ab). What language games do we participate in when using different scientific concepts? One should especially be careful

concerning the uses of nouns. Wittgenstein pronounces a special warning towards the use of nouns: “We are up against one of the great sources of philosophical bewilderment: a substantive makes us look for a thing that corresponds to it.” (Wittgenstein 1958a p 1). Many concepts are often given a substantival form instead of an original adjective or verb form. Falling in the traps of such a noun disease, scientists often search for the essential thing behind the concept. But does the concept really represent a separate thing? Or is it only to be seen as an attribute of an object, or as some kind of active process? I think, in line with Wittgenstein, that what is often expressed as a noun and thus treated as separate entity is rather an attributive concept. That it is something that is a property of an entity and not an entity in itself. Wittgenstein (1958a p 17) speaks about this as “primitive, too simple ideas of language”. He speaks especially about this problem of giving attributes a substantival form: “It is comparable to the idea that *properties* are *ingredients* of the things which have the properties; e.g. that beauty is an ingredient of all beautiful things as alcohol is of beer and wine, and that we therefore could have pure beauty, unadulterated by anything that is beautiful” (ibid).

Many concepts come in different word forms, both noun, verb and attribute forms. I exemplify with “structure”. This can be expressed in all these forms:

- a structure (noun)
- to structure (verb)
- a structured... (attribute)

Can something be seen as the original where the other forms are derivations from this basic one. A question to ask is to say: Does something exist that is only structure? The proper answer to this question is, to me, no. There is always the structure of something, i.e. the original conception of structure is that it is an attribute of something. Structure belongs to something as a property of that thing. Structures do not come by themselves separated from the things which are given structure. When we use it as a noun, which of course is acceptable in some language games, one actually mean a *structure of something*. The verb structure should thus mean *to create a structure* of some object.

Let me turn to another more complicated example: Information. This word exists in a numerous language games with many different, but often related, meanings. Even this concept come in noun, verb and attribute forms:

- information (noun)
- to inform (verb)
- an informative... (attribute)

My analysis below corresponds to Braf (2001), who also has made a “language game analysis” of information with inspiration from Wittgenstein.

Information (as a noun) has been used as such for a long time. Probably many people are not aware of that the original form is the verb form, the latin verb *informare*. This denotes a process (of someone being informed), not a state or an entity. Information, as a substantived concept, is thus to be seen as a derivation from the concept of informing. But there does not only exist one derivative meaning of information. Information can be seen both as a precondition of informing and as a result of informing. These are of course quite different meanings. Is it really true that “information” is used in these two distinct meanings? Yes, I claim it is. Let me take an example from ordinary life and the ordinary use of language: A passenger, waiting at a railway station, says to a co-passenger also waiting: “I have got

information about when the train leaves”. This is obviously a *result* of an informing process. The passenger got informed about the departure time. He got to know something. This is one way of using the concept of information. Information can be *new knowledge* to someone. But it can also be used in other language games. There is another case if one of the passengers says to the other: “I think that there is information about train departures on that timetable over there.” In this utterance, the passenger does not speak of any result of an informing process. He speaks about a *precondition* of an informing process: A timetable that consists of information about train departures. The passenger here refers to *external signs*, which have the capacity of informing people.

These two meanings of “information” are distinct. It can be seen if we use the ontology introduced in sec 2.2 above. In the first case – information as a result of an informing process – information is part of a person’s knowledge. This belongs to the ontological category (2). In the second case - information as a precondition to an informing process – information is seen as an external text, that has signifying properties. In this case information belongs to the ontological category of symbolic objects (4).

Is this not a severe problem that information can be given so distinct meanings? Is it not contrary to the main message of the SIP ontology (of sec 2.2 above) to try to locate categorised phenomena into one ontological category? If it is a problem or not depends on whether you conceive it from a scientific or a common-sense perspective. In ordinary life, I claim that this is not such a big problem. If we look at the ordinary life examples above, these do not seem problematic. People will probably understand what is meant by the different utterances. “Information” is used in different language games. The different meanings (language-in-uses) are related to each other as family concepts (Wittgenstein 1958ab). People have a tacit knowledge about these different possible language uses (meanings). What we talk about as information in ordinary life is obviously not one type of phenomenon. We can mean both new knowledge (2) and signs (4). If we turn to a scientific perspective problems may arise.

These different meanings (from ordinary life) have given rise to a huge confusion in sciences concerned with information as a key concept. This goes especially for information systems, informatics and information science. Unfortunately many researchers tend to neglect their tacit knowing of different family meanings when they move from the role of an every-day person to a researcher. It goes far beyond the purpose of this paper to propose a scientific definition of information; confer e.g. Stamper (2001) and Braf (2001) for discussions on these matters. I will however conclude this discussion, concerning information as an example of using language as conceptualisation, by stating the following: It is important, in a scientific discourse, to be clear about what one means when using a term like information, which has many family meanings in ordinary life use. It could be possible to use the term with different meanings (denoting different but related phenomena) if one has defined them clearly (e.g. “information-as-new-knowledge” vs “information-as-representation”) and that it is made clear from the context what specific meaning is being used.

The main message here is to be aware that scientific conceptualisation is language use. Different terms are used when we label our concepts. It is important to see that we use appropriate language forms when we label our concepts. We must be aware that an attribute, even if we use a substantive form, is a property and this means that it is a quality of something and not a separate entity in itself. We must reflect over using the proper language terms. A linguistic reflection in the conceptualisation process implies a determination of the

basic character of what is categorised. Are we dealing with an object, a process or an attribute or some combination? In the spirit of Wittgenstein's principle of starting with the simple (cf sec 2.1 above) we should be careful not to introduce too complex linguistic terms and conceptual constellations if we have not defined simple and well delineated concepts first.

The discussion above concerning "information" can be seen as an illustration of the way I propose how to reflect upon language use when defining concepts. If we have problems understanding what we really mean by a term, we can shift to other word forms (e.g. from a noun form to a verb or attribute form) and try out the meanings of these other forms.

4 Conclusions

What I propose in this paper is a socio-instrumental pragmatist approach for scientific conceptualisation. It is a combined approach consisting of

- *ontological determination* of concepts through clearly relating it to the different realms of the world (using the SIP ontology) and a
- reflective use of linguistic terms clarifying the type of concept used (*linguistic determination*)

This approach can guide the important process of conceptual construction. Such a combined approach can leave the social scientist with concepts clearly anchored to the world described and thus avoiding a diffuse abstractedness. When constructing and evaluating scientific categories I propose the following reflective questions to be posed and answered.

- What kind of phenomenon is this?
- Where does it exist – in what realm?
- Is it a multi-existing phenomenon?
- If so, in what realms does it exist?
- Is there an adequate correspondence between the category and its word form?
- Am I talking about a separate entity, or an attribute or a state of an entity, or some process?

This is a short paper with clear limits to make an exhaustive treatment of this subject. I have tried to show some elements of this approach (partially through the aid of some examples) and also some arguments in favor it. There is much more to be said which goes beyond the length of this paper and thus must wait for future presentations. Some of these issues are: Refining the ontology into different sub-categories, more detailed discussion about treatment of complex phenomena (multi-categories), critical analysis of scientific texts not using this kind of approach and consequences of this, a thorough epistemological argumentation of the grounds behind this approach, a comparison to other ontological frameworks e.g the three-world ontologies of Popper (1975) and Habermas (1984), and relating it to the meta-theoretical discussions concerning inductive vs deductive approaches to conceptual development.

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