Actuality-dependence, Natural Kind Terms and Reference Failures

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March 12, 2014
Abstract

This essay investigates Haukioja’s (2010) notion of actuality-dependence. This notion is an attempt to explain the rigid behaviour of some kind terms; in particular natural kind terms like “water” and “tiger”. A definition of rigidity for kind terms has to take into account speakers’ semantic intentions. This, together with the fact that actuality-dependence can only be applied successfully to a kind term if the members of its extension all share an underlying, non-trivial property, makes the notion of actuality-dependence face the problem of reference failures. A speaker’s intention for a certain term to be actuality-dependent might fail, in the sense that the members of the kind picked out by the term in question lack underlying properties of the right sort. Three ways to solve this issue are shown to be unsatisfactory, ultimately leading to the conclusion that actuality-dependence cannot be the semantic feature that single out natural kind terms as semantically special.

Acknowledgements

Thanks to Anton Käll and Mikael Skagenholt for proofreading, to Anna Nygren for many helpful comments on stylistic matters, to my supervisor Fredrik Stjernberg who helped clear out many things, and to Sam Thellman for valuable comments on various drafts of this essay.
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1 Introduction

In contemporary philosophy of language the notion of a natural kind term is often used. Paradigm examples of natural kind terms are, for example, “water”, “tiger” and “gold”; that is, terms that are names for biological and chemical kinds. Following the works of Kripke (1980) and Putnam (1975), natural kind terms are thought to constitute a special semantic category, which means that these terms are semantically special. There is something in the semantics of these terms that separates them from other kind terms like “bachelor” and “table”.

There are several ideas of how to explain exactly how and why natural kind terms are semantically special. Among the various ideas put forth in the literature on this subject, we find the idea that natural kind terms are non-descriptive, which means that they have no descriptive semantic content. Another idea, which is defended by various authors, is that natural kind terms are in some way dependent on the external world. This claim can take various forms. One can for example hold that the semantic contents of natural kind terms are object-dependent, meaning that the extensions of such terms are part of the terms’ semantic contents. An example of this idea is the Millian theory, where names’ semantic contents are exhausted by their referents. A more widely accepted idea is that natural kind terms gain their semantic content in an externalist way. By relying on the Twin Earth thought experiment, Putnam argues that “water” is semantically special because the microstructure of our paradigm examples of water, H₂O, determines the extensions of “water”. This, in turn, affect the semantics of “water”. Putnam famously formulated this claim with the snappy one-liner “[meanings] just ain’t in the head!” (Putnam 2012, p. 99), aiming to express that the meaning of “water” is dependent upon the external world.

What I will mainly be concerned with in this essay is the idea that natural kind terms, like proper names, are rigid. The notion of a rigid designator is defined by Kripke as follows: A term T is a rigid designator if and only if it designate the same object in every possible world (Kripke 1980, p. 48). This definition applies only to terms that are designators. Kripke also claims that the notion of rigidity applies to natural kind terms, but he never provides a definition for what it means for a kind term to be rigid. A kind term, unlike a singular term, is not obviously an expressionsdesignating one unique object; rather, the extensions of kind terms often consist of several objects. Kind terms can be thought of as applying to, or being true of, objects.
Recently, the question of kind term rigidity has been given much attention. It has turned out to be quite difficult to extend the notion of rigidity for singular terms to general terms. I will adopt the requirements on a definition of kind term rigidity posed by Soames in his *Beyond Rigidity* (2002). For kind term rigidity, the following requirements must be fulfilled (Soames 2002, p. 263):

(i) it must be a natural extension of the notion of rigidity that has been defined for singular terms

(ii) it must have the consequence that nearly all natural kind predicates are rigid, whereas many other predicates are nonrigid

(iii) it must play a role in explaining the necessity of true “theoretical identification sentences”

The second requirement is the most important if one wants to single out natural kind terms as semantically special by relying on the notion of rigidity—if rigidity divides our kind terms in other categories than natural kind terms and ordinary kind terms, rigidity cannot be the relevant notion.

I will investigate whether a recent explanation of rigidity for kind terms put forth by Haukioja in his 2010 paper “Rigidity and Actuality-dependence” succeeds in singling out natural kind terms as semantically special. According to this suggestion, the rigid behaviour of natural kind terms are explained by the special metasemantics of natural kind terms.

The outline of this essay will be the following. In the sections 1.1 and 1.2, I discuss the notions of semantics and metasemantics, and make some general remarks that will be important for my further discussions. I also discuss the

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1What does it mean for a notion of kind term rigidity to be a natural extension of the definition of singular term rigidity? Generally speaking, a definition of kind term rigidity has to fit into the semantic tradition in which singular term rigidity plays an important part. For example, a notion of kind term rigidity should not require descriptivism. On a more detailed level, one example of how to meet this requirement might be to construe kind terms as singular terms designating abstract kinds. The definition of kind term rigidity thus becomes similar to the corresponding definition for singular terms.

2Note that Soames talks about “predicates” whereas I use “kind terms” or “general terms”. I do not think that this difference poses any major problems. In fact, it seems that every general term can be transformed into a predicate by putting an “is” or a “being” in front of the term; the general term “water” is transformed into the predicate “is water” or “being water”; “gold” is transformed into “is gold” or “being gold”, and so forth. I will not discuss this issue further.
notion of semantic intentions. In section 2, I discuss the notion of rigidity, and argue that two proposed definitions of kind term rigidity are unsatisfactory with regards to the above requirements. Section 3 contains an outline and discussion of Haukioja’s notion of actuality-dependence. In section 4, I argue that the notion of actuality-dependence gives rise to the problem of reference failures. I then consider two ways to solve the problem of reference failures, and conclude that they are unsatisfactory. A third solution to the problem of reference failures is also shown to be unsatisfactory, since it results in a variant of the notion of actuality-dependence that fails to fulfil Soames’ second requirement. The last section contains a concluding discussion.

1.1 Semantics and metasemantics

According to Wikforss (2010, pp. 65-66), there are two ways for a term to be semantically special: Either there is something special in the term’s semantics, or else the term has a special metasemantics, i.e. there is something special in how the semantics of the term is determined.

Semantics assign semantic values to expressions that are governed by the semantics, “and explains how the semantic values of the complex expressions are a function of the semantic values of their parts.” (Stalnaker 1997, p. 535). The metasemantics, on the other hand, describes how terms’ semantic values are determined: it explains why a given language has the semantics it in fact has (Stalnaker 1997, p. 535). The distinction can be illustrated with a simple example. Consider the following two expressions

(1) John swims in Pepsi

(2) John swims in water

The semantics of (1) and (2) are similar—the interpretations of the whole expressions are dependent upon the parts in the same way. On the other hand, metasemantical accounts of (1) and (2) might differ considerably. The term “water” is often thought to have its meaning determined externalistically, unlike “Pepsi” which presumably has its meaning determined descriptively. Thus, the explanation of why (2) has the semantics it in fact has differs from the corresponding explanation for (1)—in (2), but not in (1), some kind of externalist metasemantical theory is at work.

Traditionally, kind terms and singular terms have been thought to have descriptive semantic contents which serve as conditions for anything to fall
under the terms’ extensions. One such view is defended by Frege, who hold that terms have meanings, or senses, with a twofold purpose: one is to pick out the terms’ referents, the other is to constitute the meanings of the terms. Views of this kind is often referred to as descriptivism. Kripke argues against descriptivism: extensions of proper names and natural kind terms are not determined by senses, or any other descriptive semantic conditions. Rather, the extension of such a term is determined by an initial baptizing event, where an extension is connected to the term; the extension is then brought on by causal-historical chains (Stalnaker 1997, p. 536).

Putnam argues in favour for a similar account, where the extensions of natural kind terms are determined by a dubbing act, where paradigm examples of the kind in question are pointed out. For example, the following biconditional holds true of “water” (Putnam 1975, p. 231):

$$(\text{For all worlds } w)(\text{For all } x \text{ in } w)(x \text{ is water } \leftrightarrow x \text{ is the same liquid as the stuff referred to as “this” in the actual world})$$

This account can be put in terms of applicability conditions and how those applicability conditions are determined. The applicability conditions determine what it takes for something to belong to the extension of a term; they specify criteria for belonging to the extension of a term (Schroeter 2004, pp. 428-429).

Kripke’s and Putnam’s insight is that we might be ignorant on the exact nature of the applicability conditions for some terms; in particular, this is the case for natural kind terms like “water” and “tiger”. We might not know exactly what it takes for something to be water, and we might not know exactly what it is to be of the same species as tigers. However, we do know how the applicability conditions for such terms are determined. That is, we know how it is determined what determines the extension of a term.

In the following, I will use the term applicability condition determining mechanism (or ACDM for short) to denote the mechanism by which the applicability conditions of any term are determined. One way in which terms can have a special metasemantics is that they have a special kind of ACDM. Of course, there could also be many other ways in which a term has a special metasemantics. Suppose for example that one adopts a semantical theory that assigns intensions or senses to expressions. Without further specification, ACDM:s have no implications concerning such intensions or senses. In

\footnote{The indexical “this” is to be understood as referring to a sample of water.}
this essay I will be concerned almost exclusively with questions of applicability, thus more or less ignore other aspects of semantics. In particular, the following thesis will be important: Natural kind terms are semantically special because they have a different ACDM compared to ordinary kind terms.

1.2 Semantic intentions

A notion that will be important in the following is that of a semantic intention. Semantic intentions are thought to play an important part in the metasemantics of natural kind terms. For example, Boghossian (1998, p. 201) has argued that our semantic intentions to use a term to pick out a natural kind are necessary conditions for being a natural kind term, although not sufficient ones. If no intention of using a term as a natural kind term is present, then the term in question cannot be a natural kind term. What it takes for something to be a natural kind term is cooperation between our intentions and the world. If we intend a term to pick out a natural kind, and this intention succeeds, so that the term in fact picks out a natural kind, then the term in question should be considered to be a natural kind term.

The notion of a semantic intention has to be clarified. Let us first turn to Kripke. Kripke argues in the foreword of his Naming and Necessity (1980) that the interesting notion of rigidity is de jure. Rigidity de jure, “where the reference of a designator is stipulated to be a single object” (Kripke 1908, p. 21 f.n. 21; italics in original), is to be contrasted to rigidity de facto, where a description on the form “the \(x\) such that \(F(x)\)” uses a predicate \(F\) that happens to be true of the same object in every possible world.

What does it mean to stipulate rigidity? Kripke’s definition cited above does indeed leave us with questions about how to separate de facto from de jure rigidity. The most natural way of understanding Kripke’s use of the word is, I think, to equate stipulation with a certain kind of semantic intentions; we intend some terms to be rigid, and this is what it means to be rigid de jure.\(^4\) Notice that Kripke states that de facto rigid terms have to be descriptive and have to use a predicate that applies to the same unique object across possible worlds; however, this does not mean that rigidity de jure only applies to non-descriptive terms. Intuitively, the distinction between descriptive and non-descriptive terms is a different distinction than that between terms rigid de

\(^4\)De facto rigid terms could of course also be considered rigid because of our semantic intentions. But we do not explicitly intend such terms to be rigid. Their rigidity is, so to speak, a byproduct of their semantics, which in turn results from our semantic intentions.
facto and de jure. Besson (2010) argues that the distinction between *de facto* and *de jure* rigidity is to be explained on a metasemantic level. I agree with her on this matter. However, Besson uses the direct reference metasemantical framework for doing her explanations, which I will not adopt. But at center of Besson’s explanation lies the notion of semantic (or linguistic, in Besson’s terms) intentions (Besson 2010, p. 38). For now, I think it suffices to notice that Besson, on a general level, thinks that semantic intentions determine the ACDM:s of terms. Put in terms of direct reference, the ACDM of some terms are a dubbing act, where an expression is assigned a referent (in the case of singular terms). Further on, it will be clear which kind of metasemantical framework I will be concerned with.

Now, knowing what part semantic intentions play in metasemantics, one might wonder what a semantic intention *really is*. The notion of semantic intentions can be thought of as the part speakers contribute to semantics. It is natural to think that semantics is not something that is independent of speakers, because it is difficult to understand how the world, independent of us, can determine semantic matters. For example, how could facts about the world, such as physical facts, determine if a term is rigid or not? Or to use Boghossian’s (1997, pp. 208-209) example: how could facts about whether a given term is atomic or compound be exclusively dependent upon facts external to speakers? Consider the proper name “Aristotle”. Suppose that if Aristotle actually exists (i.e. the term “Aristotle” succeeds to denote an object), then “Aristotle” is an atomic term, directly referring to Aristotle, and if Aristotle does not exist, the term “Aristotle” is a description in disguise, meaning something like “Being the individual who wrote *The Nicomachean Ethics*”. Then, “Aristotle” is an atomic term under one set of external circumstances, and a compound expression under another set of external circumstances. But how could this be possible? Besides being rather unintuitive, this view leads to conclusions treating logical form as an *a posteriori* matter. Facts about external circumstances cannot be known *a priori*, and if the logical form of “Aristotle” is dependent upon external circumstances, the logical form of “Aristotle” cannot be known *a priori* either.\(^5\)

I will treat semantic intentions as something that is had by competent speakers of the relevant language.\(^6\) There are at least two broad ways to

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\(^5\)For a critical discussion of views like this, see Häggqvist and Wikforss (2007).

\(^6\)I am here ignoring issues concerning social externalism and the idea of linguistic division of labor. It might be the case that a speaker—although competent in the relevant language—lacks semantic intentions concerning certain terms, for example terms related
conceive of semantic intentions. On one reading, semantic intentions are directly concerned with semantics, in the sense that the intentions themselves are aware and possible for the speaker to articulate, and have to do with semantic theories. On this reading, a speaker might, when using a word like “water”, intend something like “With the word ‘water’, I will refer to such-and-such stuff” or “The word ‘water’ I shall give such-and-such a semantics”. This is of course a bit crude, but I hope the general idea is fairly clear.

On the other conception, semantic intentions are dispositions to use terms in a certain way. This means that, typically, speakers do not have intentions directed at semantical matters proper, but rather dispositions to use certain terms in certain ways. This conception explains why a speaker that is ignorant on semantic matters, may still use terms in a way that can be systematized by semantic theories. A speaker ignorant on semantics cannot articulate her intentions in the above way, but she could have dispositions that conforms to certain patterns. These patterns could then be captured in semantic theories.

I would also like to make a few short remarks on the relation between semantic intentions and semantic intuitions. The primary source of evidence for or against a particular semantic theory is intuitions. For example, both Putnam and Kripke use their intuitive responses to various thought experiments as support for their theories. Now, if semantics is independent of speakers, one might wonder how the use of intuitions as evidence could be justified. One has to explain how our intuitions are able to reveal truths about semantic matters; the tie between truths of the world and our intuitions regarding those truths has to be explained. This poses a problem for views which treat semantics as a completely external matter. On the other hand, if semantics is (at least in part) dependent upon speakers’ intentions, then the intuitions serve to reveal those intentions.

2 Rigidity

One of the main ideas of what makes natural kind terms semantically special is the idea that they are rigid. A singular term is rigid if and only if it designates the same object in every possible world (where that object exists)
(Kripke 1980, p. 48). In the third lecture of *Naming and Necessity* (1980), Kripke discusses cases of *a posteriori* theoretical identities involving natural kind terms, such as “Water is H\(_2\)O”, “Tigers are animals” and the like. *A posteriori* necessary theoretical identities involving natural kind terms are supposed to be corresponding to *a posteriori* necessary identities involving rigid proper names, such as “Hesperus is Phosphorus”, “Cicero is Tully”, etc. Kripke argues that there are important similarities between natural kind terms and proper names. One of the suggested similarities is that natural kind terms, just like proper names, are rigid (Kripke 1980, pp. 127-136). However, Kripke never explicitly defines what it is for a kind term to be rigid. The definition of rigid designation does only apply to singular terms, and therefore there has to be a different account of rigidity for kind terms.

As noted in the previous section, the interesting notion of rigidity is *de jure*, which means that the rigidity of some terms is stipulated, or in other words, a direct consequence of our semantic intentions. If rigidity applies to kind terms, then one would expect rigidity *de jure*, or a corresponding notion, to be the relevant one. That is, one would think that the rigidity of kind terms is a direct consequence of our semantic intentions, rather than something that just happens to apply to certain kind terms. This can further be motivated by noting that the metaphysically interesting notion of rigidity is *de jure* rather than *de facto*. As Sidelle puts it, we introduce a term as referring rigidly to a certain entity, and “[t]his term then gives us a handle on that entity so we can investigate its properties, not only actually, but also, because of rigidity *[de jure]*, in other possible worlds.” (Sidelle 1992, p. 415).

One of the main motivations for the notion of rigidity is that it enables us to make interesting *a posteriori* modal discoveries about essences of objects *themselves*. On the other hand, terms that are rigid *de facto* already have their essential properties explicitly stated in their descriptive content. The metaphysically interesting essences of referents of *de facto* rigid terms are *a priori* knowable (Sidelle 1992, p. 413-414). For example, it is *a priori* knowable that the referent of the description “the smallest prime” has to be a prime number in every possible world. We cannot use *de facto* rigid expressions to get at the objects themselves, so to speak.

In a similar way as with singular terms, kind term rigidity should allow us to make metaphysically interesting analyses of a kind or members of a kind in modal contexts. By stipulating names for metaphysically interesting kinds to be rigid, we can analyse the properties of *that kind* or the members of *that kind* in other possible worlds.
Let us briefly take a look at which role kind term rigidity is supposed to play in theoretical identities. Haukioja argues that the following schema (NAP) captures the standard conception of how the necessity of some theoretical identities—for example “Water is H$_2$O”—is explained (Haukioja 2010, p. 400):

(NAP1) Discover empirically that in the actual world, $\forall A = B$ is true.$^7$

(NAP2) Note that the general terms A and B are rigid.

(NAP3) Reason from (NAP1) and (NAP2) to the conclusion that $\forall A = B$ is necessarily true.

This schema is not supposed to be a deductively valid argument, but a general sketch illustrating the role played by kind term rigidity in the explanation of necessary identities.

I will now briefly discuss two proposals for a definition of kind term rigidity—the simple proposal and the idea of essentialist general terms—and present some standard arguments against them.

2.1 The simple proposal

The simple proposal, or SP for short, is the view that a kind term is rigid if it designates the same kind in every possible world (see LaPorte 2000). On this view, the term “water” designates the kind water. Here, general terms function as singular terms: “water” is a singular term that designates the abstract object water-kind. Therefore, one does not have to come up with a special definition of rigidity for general terms since the existing one for singular terms can be used.

On this view, the necessary identities between kinds are actually logical identities. For example, the sentence “Water is H$_2$O” expresses something of the form “Water-kind = H$_2$O-kind”. For some kind identities, this makes quite a lot of sense. In the case of heat and kinetic motion for example, the representation $\forall x (x$ is heat $\leftrightarrow x$ is mean kinetic molecular motion) seems

$^7$The identity $\forall A = B$ can be cashed out in different ways depending on how one conceives of kinds and kind term reference. Some identities, like “Tigers are animals”, should be read as conditionals: $\forall x (Tiger(x) \rightarrow Animal(x))$; whereas others, such as “Apatosaurus is Brontosaurus” most naturally might be read as pure identities on the following form: “The species Apatosaurus = The species Brontosaurus”.

somewhat forced, since we usually do not think about either heat or kinetic motion as properties that can be ascribed to entities. Other examples are identities between names for the same biological species, such as “The honeybee = Apis mellifera”, which most naturally might be represented as “The species honeybee = The species Apis mellifera” (LaPorte 2000, p. 297).

Haukioja argues that there are problems with the very idea of treating general terms as designators for abstract kinds (Haukioja 2010, pp. 403-405). The necessity of the statement “Water is H\(_2\)O” is supposed to be an \textit{a posteriori} necessity—that water is H\(_2\)O should be an empirical discovery. But we cannot make empirical discoveries about abstract kinds—the only thing we can investigate empirically are instances of kinds. We can then make abstractions based on these instances. What can be found out empirically is that all \textit{entities} of water are also entities of H\(_2\)O. Kinds are abstract entities, and as such, they are only available to us \textit{a priori}—but that water is H\(_2\)O cannot be found out \textit{a priori}.

Another concern is that SP might trivialize the notion of rigidity (see Devitt 2005, pp. 140-143). It might turn out that all, or at least too many, general terms are rigid. Consider the general term “Obama’s favourite soda”. According to SP, the term designates the kind Obama’s-favourite-soda; in other words, “Obama’s favourite soda” functions as a name for the abstract kind Obama’s-favourite-soda, and since all names, according to the standard definition of rigidity for singular terms, are rigid, “Obama’s favourite soda” is a rigid term. Suppose that Obama’s favourite soda is Sprite. If this is the case, “Obama’s favourite soda is Sprite” is a true statement. And since “Sprite” is a name for the Sprite-kind, it is a rigid term. According to the usual way of deriving necessary identity statements between singular terms, the statement “Obama’s favourite soda is Sprite” is necessarily true. However, this is highly counterintuitive; it is easy to imagine a possible world where Obama prefers Pepsi over Sprite.

Arguments as the above also shows that the SP account has to rely extensively on metaphysical doctrines, rather than the semantics of natural kind terms: One might try to exclude kinds like Obama’s-favourite-soda-kind by adopting a selective realism account about abstract kinds, but as Devitt argues, this reduces the SP account to a pure metaphysical discussion (Devitt 2005, pp. 141-143).

Thus, the trivialization problem shows that SP cannot do the job of placing natural kind terms in a special semantic category; at least not without relying on special metaphysical theories.
2.2 Essentialist general terms

Another idea of how to define kind term rigidity is the idea of essentialist general terms. The notion of an essentialist general term is defined as (Soames 2002, p. 251):

\[(ET) \text{ A general term } T \text{ is essentialist if and only if, for all objects } o \text{ and possible worlds } w, \text{ if } T \text{ applies to } o \text{ in } w, \text{ T applies to } o \text{ in all possible worlds where } o \text{ exists.}\]

The idea behind (ET) is that if a kind term is rigid and true of an object, then that kind term is true of that object in all possible worlds where that object exists. Thus, if an object essentially is F, then that object cannot exist without being F.

Soames (2002, pp. 251-259) argues against this suggestion by showing that (ET) produces the wrong sort of necessary identities. Consider a case where we construct a compound predicate:

\[\lambda x (x \text{ is a lemur or } x \text{ is a human or } x \text{ is a monkey or } x \text{ is an ape}).\]

Soames (2002, pp. 257-259) argues that, since the terms “human”, “monkey”, “lemur” and “ape” presumably are rigid/essentialist terms (since they presumably are natural kind terms), so is the above compound predicate. If we suppose that “primate” also is rigid, the following sentence should be necessary:

\[\forall y (y \text{ is a primate } \leftrightarrow \lambda x (x \text{ is a lemur or } x \text{ is a human or } x \text{ is a monkey or } x \text{ is an ape}) \text{ y}).\]

We note that it is true: the term “primate” applies to everything which \(\lambda x (x \text{ is a lemur or } x \text{ is a human or } x \text{ is a monkey or } x \text{ is an ape})\) applies to—that is, every primate in the actual world is either a human, a monkey, a lemur or an ape.\(^8\) Both terms are rigid/essentialist. Therefore, the above identity is necessary. But this result is not very appealing. It is easy to imagine a possible world where this is false, for example a world where a new species of primates, different from humans, lemurs, apes and monkeys, has evolved. This example illustrates the point that the essentialist conception of rigidity results in the wrong sorts of necessary identities.

\(^8\) Notice that some kind of time-index might be needed here. The biconditional holds at present time, but it is, for example, possible that new species of primates evolve in the future.
The derivation of the necessity of certain identities is done following a version of the schema (NAP). The two premises are:

(NAP1') Discover that $\forall x(A(x) \leftrightarrow B(x))$ is true/$\forall x(A(x) \rightarrow B(x))$ is true.

(NAP2') Note that the terms A and B are rigid/essentialist.

From these premises, the desirable conclusion is $\Box \forall x(A(x) \leftrightarrow B(x))$ is true/$\Box \forall x(A(x) \rightarrow B(x))$ is true. However, this is not the conclusion following from the premises. Remember that an essentialist general term applies to an object o just in case that object exists in a world. Given that the domain of the universal quantifier is all objects existing in a world, (NAP1') above states that any thing that exists in the actual world and is an A is also a B, or else is neither an A nor a B. If A and B are essentialist terms, we are guaranteed that everything that exists in the actual world and is an A, necessarily is a B. The conclusion that follows from the premises is thus $\forall x\Box(A(x) \leftrightarrow B(x))$ is true/$\forall x\Box(A(x) \rightarrow B(x))$ is true.

The trouble is that (ET) does not account for objects that do not exist in the actual world. In the example above, the conclusion that can be derived is

$$\forall y\Box(y \text{ is a primate} \leftrightarrow \lambda x(x \text{ is a lemur or } x \text{ is a human or } x \text{ is a monkey or } x \text{ is an ape} ) y).$$

This conclusion is true but trivial. For it to be interesting, (ET) and (NAP') should produce conclusions on the form $\Box \forall x(A(x) \leftrightarrow B(x))$ is true/$\Box \forall x(A(x) \rightarrow B(x))$ is true.

The notion of an essentialist term thus fails to produce the right sorts of necessary identities, thus this definition does not fulfil Soames’ third requirement.

3 Haukioja’s notion of actuality-dependence

In his paper “Rigidity and Actuality-dependence” (2010), Haukioja suggests that the rigid behaviour of some general terms is a consequence of a metasegmental account of how those terms’ extensions are fixed in modal contexts. A related account is proposed in Haukioja’s paper “Proto-rigidity” (2006).
definition of general term rigidity has to be a natural extension of the definition for singular terms (Soames 2002, p. 263). However, since Haukioja’s account covers both singular and general terms, the rigid behaviour of some singular terms, for example proper names, is explained in the same way as the rigid behaviour of some general terms.

Haukioja’s presentation of actuality-dependence makes use of some special terminology. For every singular or general term T, there is an associated applicability role, denoted by R_T. Entities that belong to the extension of a term T in the actual world are said to play the applicability role R_T. The applicability role for a term consists of the criteria that anything must fulfil in order to belong to the extension of the term. Our uses of a term determine such criteria of application, which are then specified by an applicability role. The term “water”, for example, might in the actual world apply to anything which possesses the characteristic properties (or part of them, if we adopt a cluster description account of reference fixing) we associate with the term, for example being a thirst-quenching liquid or filling our lakes and seas and falling from the sky as rain. These criteria are specified in the applicability role for water, R_water. The applicability role for the name “Barack Obama”, if one adopts a Kripkean causal-historical account of reference, might be spelled out as something like being at the end of a causal reference chain leading up to our uses of the name “Barack Obama”.

Some applicability roles are realized by a realizing property. There is a crucial difference between the realizing property and the applicability role that it realizes. Realizing properties are properties of entities, while the applicability roles specify what it takes to belong to the extension of a term. The realizing property for an applicability role is a property that makes an entity fulfil the applicability role. In the case of water, it is often thought that the chemical microstructure of water, abbreviated by H_2O, is the property ultimately responsible for the manifest properties like being a thirst-quenching liquid. Thus, the realizing property for R_water is, presumably, the microstructure of water, spelled out as being a compound molecule consisting of two hydrogen atoms and one oxygen atom.

We are now in a position to define the notion of actuality-dependence (Haukioja 2010, p. 406):

(AD) A singular or general term T is actuality-dependent if and only if it applies in non-actual worlds to the thing or things which possess the properties which realize R_T in the actual world. If this is not the case,
T is actuality-independent.

This means that the non-actual extensions of an actuality-dependent term are determined by the nature of the objects in the term’s actual extension (Haukioja 2010, p. 406). For actuality-independent terms, there are no realizing properties; at least not any non-trivial ones. Haukioja makes the assumption that a realizing property is not allowed to be circular in the sense that “the property of playing role R cannot be a realizer for R.” (Haukioja 2010, p. 406, fn. 11). The term “bachelor”, for example, is actuality-independent since there is no underlying property shared by all bachelors, apart from the property of playing $R_{\text{bachelor}}$. Thus, the extensions of “bachelor” in non-actual worlds are anything that play (the actual) $R_{\text{bachelor}}$ in those worlds. The term “water” is on the other hand actuality-dependent, since there presumably is a special, non-trivial, property that ultimately causes the possession of the properties that we use to fix the actual extension of the term. Further, in order for the necessity of theoretical identities like “Water is H$_2$O” to come out as a posteriori, finding out about the exact nature of realizing properties has to be an empirical matter.

The difference between an actuality-dependent and an actuality-independent term is how they gain their non-actual extensions. While the criteria for belonging to the extension of an actuality-independent term—i.e. playing the associated applicability role—are stable across possible worlds, the criteria for belonging to the extension of an actuality-dependent term in the actual world are different from the corresponding criteria in non-actual worlds.

### 3.1 Explaining necessary identities using actuality-dependence

The main achievement of the notion of actuality-dependence is that it can do the explanatory work expected to be done by rigidity in the case of necessary identities. Recall that the derivation of necessary identities is supposed to be done according to the schema (NAP). Haukioja uses a variant of this schema, (NAP*), for the derivation of the necessity of $\square (A = B)$ (Haukioja 2010, p. 407):

(NAP1*) Discover empirically that the applicability roles associated with the terms A and B are realized by the same property.

(NAP2*) Note that A and B are actuality-dependent.
Reason from (NAP1*) and (NAP2*) to the conclusion that $A = B^*$ is necessary.

Since actuality-dependence is a notion that applies to both singular and general terms, the identity $A = B^*$ is not specified in detail in the schema. In the case of singular terms, this identity is a logical identity, while in the case of general terms, the identity is represented by a conditional or a biconditional: $\forall x (A(x) \rightarrow B(x))$ or $\forall x (A(x) \leftrightarrow B(x))$.

In the case of “Hesperus” and “Phosphorus”, we discover that the applicability roles associated with the terms (they might for example be spelled out as something like being the heavenly body that shines bright in the evening and being the heavenly body that shines bright in the morning, respectively) in fact are realized by the same property, namely that of being Venus (Haukioja 2010, p. 408). We note that “Hesperus” and “Phosphorus” are actuality-dependent, since they are proper names. We now reason from these two premises to the conclusion that “Hesperus = Phosphorus” is necessarily true.

For general terms, Haukioja uses an example that nicely reflects the Hesperus/Phosphorus case: Actuality-dependence can be used to explain the a posteriori necessity of “Apatosaurus = Brontosaurus”. Apatosaurus and Brontosaurus were supposed to be different dinosaur species, but it turned out that they were the same (Haukioja 2010, p. 403). It was discovered that the applicability roles associated with “Apatosaurus” and “Brontosaurus” were realized by the same property: “the species-determining properties of the Brontosaurus and the Apatosaurus are one and the same” (Haukioja 2010, p. 405). And since “Apatosaurus” and “Brontosaurus” presumably are actuality-dependent, it follows, according to the schema (NAP*), that “Apatosaurus = Brontosaurus” is necessarily true.

The a posteriori necessity of “Water is H$_2$O” is explained in a slightly different way. Haukioja argues that “H$_2$O” is a semantically complex term; in fact, it is an abbreviation of the description “being a compound molecule composed of two hydrogen atoms and one oxygen atom” (Haukioja 2010, 409). Therefore, “H$_2$O” is an actuality-independent term whose extensions in both the actual world and in non-actual worlds are everything that plays the associated applicability role, which is, because of the descriptive content of the term, being a compound molecule composed of two hydrogen atoms and one oxygen atom. “Water” is on the other hand actuality-dependent and applies, in non-actual worlds, to anything that possesses the realizing property that actually realizes $R_{\text{water}}$. But this property is presumably that of
being a compound molecule composed of two hydrogen atoms and one oxygen atom. Thus, both “water” and “H₂O” applies to the same things in all possible worlds, and the identity “Water is H₂O” is necessarily true.

3.2 The semantic status of actuality-dependence

The notion of actuality-dependence is a metasemantic account—it specifies a special kind of ACDM. Further, this special kind of ACDM concerns only conditions of non-actual applicability. In fact, the notion of actuality-dependence is silent on how extensions and applicability conditions are determined in the actual world. For example, actuality-dependence is compatible with a Kripkean causal-historical account of reference fixing, as well as a descriptive one. The difference lies in how the relevant applicability roles are specified. Take the term “tiger” for example. If one wants to adopt a causal-historical account of reference fixing, one can specify the applicability role Rₜiger as something like being of the species at the beginning of the causal-historical chain of reference leading up to my use of the term “tiger”. This is then the criterion something in the actual world has to fulfil in order to belong to the extension of “tiger”. If one wants to adopt a descriptive account of reference fixing, the applicability role might be specified as something like being a quadrupedal feline with blackish stripes or being an object of which a sufficient number of certain descriptive statements are true, etc. The point here is that the non-actual applicability conditions of “tiger” are determined in the same way regardless of how the actual extension is determined. Further, the notion of actuality-dependence does not presuppose any specific theory of semantic content. Thus, the notion of actuality-dependence is only concerned with the determination of conditions for non-actual applicability.

This leads us to another important point. The actuality-dependence account treat kind terms as applying to objects, or as being true of objects, rather than being referential.¹ This has implications concerning the truth values of statements containing actuality-dependent kind terms. In particular, it means that all theoretical identities between kind terms have to be analysed as conditionals and biconditionals. It might then be possible to derive a logical identity between kinds on basis of abstractions of these conditionals and biconditionals paired with a conception of rigidity in the lines

¹For views which treat kind terms as referential, see e.g. LaPorte (2000) and (2004), and Besson (2010).
of SP (Haukioja 2010, p. 407). For my purposes here, however, it is sufficient to notice that the explanatory work in the derivation of necessities is done by the notion of actuality-dependence and the conception of kind terms as applying terms.

In section 1.2 and 2 above, I discussed the notion of rigidity de jure, which I argued is to be understood as the claim that the rigidity of some terms is a result of our semantic intentions. In the same way, actuality-dependence should be understood as resulting from our semantic intentions. In fact, Haukioja notes that for proper names, actuality-dependence coincides with de jure rigidity (Haukioja 2010, p. 408). Another interesting thing to notice is that actuality-dependence seems to reflect the distinction between de jure rigid terms and other terms, rather than a distinction between rigid and non-rigid terms. Consider the derivation of the necessity of “Water is H\textsubscript{2}O” discussed above: in this case, “H\textsubscript{2}O” turns out to be an actuality-independent term, but it applies to the things which consist of two hydrogen atoms and one oxygen atom in every possible world. There is an important similarity here with de facto rigid terms. “H\textsubscript{2}O” just happens to be a description of a property that is true of one and the same kind in every possible world.

The above examples should indicate that the terms which are actuality-dependent are those that presumably are natural kind terms. Thus, it seems that actuality-dependence might be able to single out natural kind terms as semantically special. The thesis I am interested in investigating is the following: Natural kind terms are semantically special because the way in which their non-actual extensions are determined differs from the way other kind terms’ non-actual extensions are determined. In other words: A term is a natural kind term if and only if it is actuality-dependent.

4 Actuality-dependence and reference failures

The remaining part of this essay will concern the problem of reference failures. This problem is well known from the literature on proper name semantics. There are many names which fail to refer: examples are “Vulcan” and “Pegasus”. These are often known as empty names. The problem consists in which type of semantics empty names should be given, and how sentences containing such names are to be evaluated. There is a corresponding problem for natural kind terms, where terms are introduced as names for natural kinds, yet fail to be true of anything. Examples of such terms might be “ether” or
“phlogiston” which were introduced as names of entities that turned out to be non-existent.\textsuperscript{11}

However, in this essay I will be concerned with a different kind of problem of reference failure that arises from the theory of actuality-dependence. This is a problem which follows from the idea of actuality-dependence as resulting from our semantic intentions. On the actuality-dependence account, we intend some terms—presumably the natural kind terms—to have an ACDM that makes those terms actuality-dependent. But the notion of actuality-dependence relies on the notion of realizing properties, and it cannot be known \textit{a priori} that the members of a given kind actually possess such realizing properties. This allows for the possibility that a term, intended to pick out a kind whose members share a realizing property, fails to do so. For example, suppose that “water” is intended to be actuality-dependent, which means that non-actual extensions are determined by the actual realizing property. Suppose further that it turns out that there is no realizing property shared by the members of actual samples of water. Needham argues that water is individuated on basis of manifest properties, rather than its microstructure (Needham 2000); if this is true, then \( \text{H}_2\text{O} \) is not the relevant realizing property that realizes \( R_{\text{water}} \), thus leaving the criteria of non-actual applicability undefined.

The following discussion shows that reference failures threaten to be quite extensive. Notice that the notion of a realizing property is vague: it is not at all clear which properties actually qualify as realizing ones. If one sticks with a vague conception of realizing properties, it is difficult to pick out the realizing property of any given object. As Wikforss notes, every object instantiates an infinite number of kinds (Wikforss 2010, p. 67). Thus, any given object might instantiate several candidates for a realizing property. In order to pick out the right one, the notion of realizing properties has to be further specified.

However, it has turned out to be very difficult to find a conception of underlying properties which applies to all natural kinds. If a conception of realizing properties that characterises them as underlying physical structures is adopted, then several of the standard paradigm examples of natural kind terms are excluded from the category of actuality-dependent terms. Kripke (1980, e.g. p. 138) often uses various animals like tigers or cats and their corresponding terms as paradigm examples of natural kinds and natural kind

\textsuperscript{11}For a discussion of this kind of reference failure, see Besson (2012).
terms, and Putnam uses “lemon” as an example of a natural kind term in his “The Meaning of ‘Meaning’” (1975, p. e.g. p. 240). In the late 1960’s, when Kripke and Putnam developed their theories of natural kind naming, it was part of popular science that biological kinds could be individuated by hidden physical structures (Hacking 2007, p. 12). However, in the case of lemons, this has turned out to be false: the kind lemon cannot be individuated in terms of DNA to the extent that Putnam thought. Regarding chemical kinds, Needham argues that water cannot be individuated solely on basis of its microstructure (Needham 2000). Thus, recent scientific findings and discussions in the philosophies of chemistry and biology have shown that the category of natural kinds is not as coherent as once thought. Consequently, different specifications of realizing properties results in different categories of kinds; on some accounts, a particular kind might have a realizing property, while on others, the same kind might lack a realizing property. This means that, if no satisfying conception of realizing properties is defined, the danger of massive reference failures becomes imminent.

In the two following sections, I argue that two ways to solve the problem of reference failures are unsatisfactory because they lead to further problems. In the last section, I argue that another idea—that of disjunctive semantic intentions—threaten to make actuality-dependence apply to other terms than natural kind terms. This implies that Soames’s second requirement of a definition of kind term rigidity, which states that kind term rigidity should apply (almost) exclusively to natural kind terms, has to be rejected. Thus, it must be concluded that actuality-dependence cannot be the semantic feature of natural kind terms that makes them semantically special.

4.1 An a posteriori conception of actuality-dependence

On basis of the above remarks on reference failures that arises from the idea of actuality-dependence being based on semantic intentions, one might think that what terms are actuality-dependent are a completely a posteriori matter, in the sense that whether or not a term is actuality-dependent depends on whether the term in fact succeeds in picking out a kind whose members all possess a realizing property. Then, the problem of reference failures is dissolved—there simply are no cases of reference failures.

Wikforss argues that it is not obviously problematic to hold that a term is a natural kind term if and only if it names a natural kind (Wikforss 2010, p. 68); however, the above suggestion is slightly different, because actuality-
dependence is a (meta)semantic feature of some terms, having to do with what kind of ACDM the relevant terms have. Thus, which kind of ACDM a term has becomes a question of extensive scientific investigation. This, in turn, means that one cannot do semantics independently of scientific and metaphysical investigation.

To see why this is such a radical thesis, remember that the category of natural kind terms is very diverse, and highly dependent upon which theory one chooses to adopt. The problem is to find a conception of realizing properties that is not too excluding, nor too liberal. The important thing to note is that the category of terms with the (meta)semantic property of actuality-dependence changes depending on how one specifies realizing properties. This means that on one metaphysical theory, a particular term might turn out to be actuality-dependent, while on another metaphysical theory, the same term might be actuality-independent.

On this a posteriori conception, the semantics of some terms are directly dependent upon how one specifies realizing properties. Further, this account is not at all dependent on speakers’ semantic intentions, thus rejecting the conception that the ACDM of terms are dependent on us, rather than the world. It is indeed hard to understand how the semantics of our language is solely dependent on the physical world.

4.1.1 Disjunctivism regarding actuality-dependence

One idea that might solve the above problem is the idea of giving natural kind terms a disjunctivist metasemantics, where speakers’ intentions play a necessary, but not sufficient, role in what ACDM a given term should be given. The idea is this: We intend some terms, for example “water”, to be actuality-dependent, and if the world cooperates and “water” successfully picks out a kind with a realizing property, the term becomes actuality-dependent (that is, is given an ACDM in accordance with (AD)), or else it does not pick out a natural kind, and the term becomes actuality-independent (is given an ordinary kind term ACDM). This means that, if the term succeeds in picking out the right sort of kind, the non-actual extensions of a presumed actuality-dependent term are determined by a realizing property; otherwise, the non-actual extensions are determined by the actual applicability role.

It should be noted that this is an account of the metasemantics of assumed natural kind terms: the disjunctivist account does not concern the realizing properties for the applicability roles associated with the terms in question,
in the sense that the realizing property for e.g. \( R_{\text{water}} \) is spelled out as the property of being a compound molecule consisting of two hydrogen atoms and one oxygen atom or being an entity of which some descriptive statements are true. Such an account would make entities consisting of XYZ molecules on Twin Earth belong to the extension of “water”.

One of the motivations for this account is to re-establish the connection between terms’ ACDM:s and speakers’ intentions. In order to avoid the problematic conclusion in the previous section, semantic intentions can be treated as necessary, although not sufficient, conditions for a term to be actuality-dependent. Then, a term can only be actuality-dependent if the world cooperates with our intentions, in the sense that it in fact picks out the right sort of kind, and we intend it to be actuality-dependent. On this account, the actuality-dependence of some terms is dependent both upon the world and our intentions.

However, the world seems to be more important than our intentions when determining what ACDM a purported natural kind term should be given. This means that, ultimately, the ACDM:s of actuality-dependent terms are determined by the world, even though our intentions sort out which terms have their ACDM determined in this way. The problem is that the world can overrule our intentions: we might intend a particular term to be actuality-dependent, but the kind picked out does not possess any realizing properties. In such a case, the term is actuality-independent, whatever our intentions. As Wikforss notes, the intention is rather to be characterised as a belief, since we really do not have any control over what kind of ACDM a term, say “water”, has (Wikforss 2005, p. 73).

This leaves us with an account that is no better off than the original \textit{a posteriori} option discussed above.

4.2 No extensions in non-actual worlds

On an externalist account, where both the actual and non-actual applicability criteria are dependent upon underlying, non-manifest properties, a case of reference failure would lead to lack of extension in both actual and non-actual worlds. One such account is Haukioja’s notion of proto-rigidity, which states that “superficial properties are not sufficient for determining [proto-rigid terms’] correct application in the actual world” (Haukioja 2006, p. 161-162).

On the other hand, in the case of the actuality-dependence account, the
extensions of terms in the actual world are completely determined by the
criteria specified in applicability roles. If determining the actual extension is
not dependent upon realizing properties, at least the actual extension of an
actuality-dependent term can be determined. Suppose, for example, that the
actual applicability role is specified descriptively. On a descriptivist account,
an actuality-dependent term does not lack actual extension if it turns out
that it does not pick out a kind with a realizing property, since the criteria
for belonging to the extension of the term in question are not dependent on
realizing properties. This means that the criteria for actual application of
a term differ from the criteria of non-actual application of the term. While
the criteria of actual application are determined descriptively, the criteria
of non-actual application rests upon the realizing properties which underlies
the actual extensions.

A similar idea is developed in Glüer and Pagin (2012). They develop
a special semantic framework called “evaluation switcher semantics”, where
some terms have a special sort of semantics: they have two intensions, or
senses, that determine extension in the actual world and in non-actual worlds.
The first intension is descriptive, and serves to fix the term’s actual exten-
sion on basis of manifest properties, and the other intension serves as the
term’s non-actual reference determiner, which fixes extensions in non-actual
worlds on basis of non-manifest, underlying, properties. This means that if
a presumed natural kind term fails to pick out a natural kind, the descrip-
tive intension is left intact, while the intension that picks out underlying
properties is undefined.

Reference failures seem to be less problematic for an account along these
lines. As Glüer and Pagin note, reference failures “never destroy the whole
meaning” (2012, p. 188). However, this account still leads to some problem-
atic conclusions.

First, we can note that there is a methodological problem regarding the
above idea paired with the notion of actuality-dependence. For the actuality-
dependence account, this move requires the applicability roles of purported
natural kind terms to be independent of typical external factors such as
microstructure or other kinds of non-trivial, unifying properties. Haukioja
states that one of the merits of the notion of actuality-dependence is that
it is compatible with several semantic and metasemantic frameworks. This,
he thinks, makes the notion of actuality-dependence superior over Glüer and
Pagin’s semantic theory (Haukioja 2010, p. 408, fn. 14). But the above idea
excludes semantical theories that are externalist in some way, thus limiting
the applicability of actuality-dependence to strictly descriptivist semantical frameworks. This seriously undermines Haukioja’s argument for the superiority of his account over Glüer and Pagin’s.

Second, note that modal talk is of no less importance than non-modal talk. Indeed, in Naming and Necessity (1980), Kripke is concerned with the problems for descriptivism in modal contexts; in particular, he argues that if we adopt descriptivism, then the truth values of modal sentences containing proper names and natural kind terms oppose our intuitions regarding them. A similar point can be made about actuality-dependent terms involved in cases of reference failure. The proposition expressed by “Water is wet” is true if the stuff that belongs to the extension of “water” is in fact wet. Suppose now that the actual applicability conditions for the term “water” are descriptive—the actual applicability role \( R_{\text{water}} \) might be spelled out as something like being an odourless liquid that fills our lakes and falls from the sky as rain. The term “water” is actuality-dependent, which means that its applicability conditions for non-actual applicability are dependent on the realizing property that actually realizes \( R_{\text{water}} \). Suppose further, for the sake of argument, that there is no realizing property possessed by the members of the actual extension of “water” and that this fact is unknown to us. This means that no conditions for non-actual applicability are defined, and consequently that there cannot be any non-actual extensions of “water”: in non-actual worlds, “water” is true of nothing. In this scenario, the sentence “Water is wet” is true when uttered in the actual world, since the extension of “water” in fact is wet. But the proposition expressed by “It is possible that water could have been dry” is false. The proposition is true if there is a possible world where “Water is dry” is true, and since “water” lacks extension in all non-actual worlds, “Water is dry” is false in every non-actual world.

Reference failures also produce necessary truths that, so to speak, are a result of semantics rather than metaphysics. Consider the sentence

\[
1. \forall x(x \text{ is water} \rightarrow x \text{ is of a substance in which fish live})
\]

which is true in the actual world (at least at present time). But if there is no realizing property possessed by all members of the actual extension of “water”, (1) is also true in every non-actual world, since a conditional, \( \forall x(A(x) \rightarrow B(x)) \), is true when nothing belongs to the extension of \( A \). In non-actual worlds, nothing belongs to the extension of “water”, and thus,
(1) is true in every non-actual world. This means that (1) is true in every possible world, thus fulfilling the conditions for being necessarily true.

When reflecting on how we use the term “water”, and in particular take into account the importance of modal talk involving “water”—for example when formulating scientific hypotheses about water, or when doing metaphysics—it becomes clear that one should be careful with reference failures, even when they only affect modal talk. It is highly counterintuitive that much talk about possibilities concerning a kind, say water, could turn out false, or that sentences like (1) could turn out necessarily true—it is indeed easy to imagine a world where no fish live in the substance in which actual fish live. Remember that rigidity is supposed to provide us with a handle on kinds and members of kinds which we can use to analyse them in non-actual worlds. In cases of reference failures, all such activity becomes impossible to perform successfully. If reference failures are extensive, as I argued threatens to be the case, then the effects on science and metaphysics—which to a large degree are concerned with modalizing—are devastating and unacceptable.

Thus, limiting the effects of reference failures to modal contexts is still highly problematic. These considerations seriously undermine the suggestion reviewed in this section. This account might be a little better off than an all over externalist account, but that is not to say that it is satisfactory; the problems reviewed above are, I think, a too high price to pay.

4.3 Disjunctive semantic intentions

Haukioja argues that the intuitions we have about purported natural kind terms are sufficient to support disjunctive semantic intentions (or conditional intentions, as Haukioja prefers) (Haukioja 2009, p. 87). Haukioja talks about disjunctive semantic intentions regarding externalism in general, but the idea is applicable to the case of actuality-dependence as well. The idea is that we intend the non-actual extensions of a purported natural kind term to be determined by an actual realizing property, if there is any such realizing property, or else the extensions are determined in ways that do not involve such realizing properties. Put in the terminology used to present actuality-dependence, a formalization of a disjunctive semantic intention directed at the word “water” can be put as follows:

(DSI) The non-actual extensions of “water” are anything that possesses the realizing property that actually realizes
If there is one realizing property shared by the members of the actual extension of the term in question, then this property determines non-actual extensions of the term, and if there is no such property, the non-actual extensions are determined in the same way as the actual extension. Korman develops a similar account and states that the explicit pattern put forth in for example (DSI), are “semantic (or perhaps ‘metasemantic’) principles that reflect our tacit semantic intentions with regard to the content of our word ‘water’.” (Korman 2006, p. 509).

(DSI) assures that if water is actually H\textsubscript{2}O—if samples of water actually share the realizing property expressed by H\textsubscript{2}O—then this property determines the non-actual extensions of “water”. If it turns out that water is, for example, like jade, i.e. there are several realizing properties among the actual samples of water, or if water lacks a realizing property altogether, then non-actual extensions of “water” are anything that plays the actual applicability role.

According to Haukioja, intuitions supporting the idea of such disjunctive intentions can be captured by “fairly simple thought experimentation” (Haukioja 2009, p. 89). One such “fairly simple thought experiment” might perhaps be the following. Suppose that there in fact are several realizing properties realizing actual watery phenomena. For example, imagine that there are samples of water consisting of H\textsubscript{2}O molecules, as well as samples consisting of XYZ molecules. Perhaps there are also samples of water consisting of ASD molecules, FGH molecules, etc.\textsuperscript{12} Consider now a Twin Earth where watery phenomena are realized by JKL molecules. In this case, do samples of JKL fall under the extension of “water”? If you answer “yes”, then it could be argued that your intuitions about the criteria of non-actual applicability of “water” conforms to (DSI).

Regarding the semantic category of natural kind terms, the thesis I am interested in now is this: The category of natural kind terms is the category of terms whose non-actual ACDMs conform to (DSI).

\textsuperscript{12}These chemical structures are of course completely imaginary.
4.3.1 Objections

Häggqvist and Wikforss (2007) argue that disjunctive semantic intentions require the speaker to have metasemantic intentions; intentions concerning metasemantic theories (Häggqvist & Wikforss 2007, p. 382). Such metasemantic intentions cannot be required of non-expert speakers, since it would be too demanding.

In answer to this concern, Haukioja argues that disjunctive semantic intentions can be inferred from our language use on basis of intuitions regarding individual cases. Haukioja stresses that explicit expositions of disjunctive intentions, like (DSI), are only formalizations of the intentions of speakers; speakers do not need to have detailed knowledge of metasemantic matters to have such intentions (Haukioja 2009, p. 88). A speaker need not explicitly intend “water” to gain its extension according to (DSI), since this would require that a speaker living in, say, the 16th century, to have overly sophisticated intentions concerning the non-actual extensions of “water” that she cannot possibly have. If our intuitions regarding cases involving natural kind terms like “water” show that we use those terms in accordance with a structure like (DSI), we can, according to Haukioja, infer that there are indeed semantic intentions that can be formalized along the lines of (DSI). This account does not ascribe any metasemantic knowledge to lay speakers. Rather, a speaker, in order to be competent in the relevant language, has to form dispositions that conform to patterns of uses of a term (Haukioja 2009, p. 88). By relying on the evidence from linguistic intuitions about uses of terms, we can make these patterns manifest in formalizations like (DSI). Thus, semantic intentions are just dispositions to use language in a special way.

The objection posed by Häggqvist and Wikforss looses its power if we conceive of semantic intentions as dispositions, rather than explicit intentions concerning semantics. Note that Häggqvist and Wikforss’ problem actually applies (although in a slightly less problematic way) to the idea of a semantic intention in lines of intending to pick out a kind with a realizing property as well. It might be “one thing to suggest that speakers intend ‘water’ to name a natural kind, a stuff with a unified underlying structure” (Häggqvist & Wikforss 2007, p. 382) and quite another to suggest that they intend something along the lines of (DSI), but I think that it might even be implausible to hold that speakers explicitly intend a term to pick out proper realizing properties. For consider speakers of 11th century Norse (this example is in fact the one
used by Häggqvist and Wikforss); I think it would be utterly implausible to attribute to them intentions to use some terms to pick out realizing properties—indeed, they lack the concept of a realizing property altogether. To even attribute to them awareness of semantics, and applicability conditions in particular, seems implausible to me. Even speakers unschooled in modern philosophy of language of our time probably do not have explicit intentions concerning the semantics of the terms they use.

My above remarks are of course merely intuitions, but here is a proper argument against semantic intentions characterised as explicit intentions concerning the semantics of terms. First, notice that the truth conditions of a sentence presumably are compositional, i.e. the truth conditions of a whole sentence is dependent on its compositional parts. Now, a semantic intention regarding a specific term occurring in a sentence has to be concerned with the truth conditions of the sentence as a whole, in the sense that one intends how the term contributes to the whole; or, the intention concerns the extension and meaning of the term alone. But the first option is implausible, since it requires speakers to have intentions directed at complete sentences. The latter, on the other hand, concerns delicate questions of compositionality; and compositionality is a very complex matter that has puzzled philosophers of language, i.e. experts on the matter, for a long time. To require lay speakers to have intentions related to such matters would be implausible.

On the other hand, if semantic intentions are characterised as dispositions concerning language use, a disjunctive semantic intention is no less plausible than an intention to use a term to pick out a proper realizing property.

4.3.2 A thought experiment

For the following discussion, assume that we have dispositions to use certain terms in accordance with (DSI). I will argue that it is unclear that our dispositions to use some terms in accordance with (DSI) are not exclusively directed towards the extensions of typical natural kind terms.

Consider the following thought experiment, originally discussed by Putnam (Putnam 1975, p. 242-245). Imagine that we discover all pencils on Earth to be organisms; when we dissect them, we find nerves, bowels, and brain substance. Now, what do our intuitions tell us about this case? Surely, we would update our beliefs about the necessary and possible features of the things we refer to with the word “pencil”. Just as we can imagine a tiger possibly lacking its characteristic stripes, we can imagine the pencil-organisms
lacking their usual shape or colour, or even function. It turns out that the pencil-kind in fact belongs to the natural kinds, and therefore we should expect the pencil-organisms to share some kind of species-determining property; this property determines what is necessary and possible about pencils.

The question now is whether our reaction to the above scenario would be to say “All pencils turned out to be organisms” or “There are no pencils in the world”. Imagine the above scenario but in a possible, non-actual world: then we would go with the latter, Putnam (1975, p. 243-244) argues, since the meaning of “pencil” is determined by our actual use of the term, and since we use the term “pencil” to refer to non-organism artefacts, this will be the extension of the term. Thus, if the nature of actual pencils is as we believe, then it would turn out that, in a possible world as the one described above, there would be no pencils. In the same way, if it actually turns out that pencils are organisms, we would use the term “pencil” to refer to pencil-organisms, and then it would turn out that all pencils are organisms, rather than there being no pencils.

How can these dispositions regarding the use of “pencil” be formalized? One idea would be to invert the hierarchical order of (DSI). Purported non-natural kind terms prefer to be actuality-independent, but if it turns out that we were mistaken about a presumed non-natural kind term, and it does in fact pick out a kind possessing a realizing property, then the term in question should be actuality-dependent. The inverted version of (DSI) reads

(\text{DSI}^*) \text{ The non-actual extensions of “pencil” are}

\begin{itemize}
  \item anything that plays the actual \(R_{\text{pencil}}\);
  \item else, anything that possesses the realizing property that actually realizes \(R_{\text{pencil}}\).
\end{itemize}

This will not do. We always have the option to use a term in an actuality-independent way: even though our (Putnam’s) intuitions regarding Twin Earth tell us that non-actual extensions of “water” are determined on basis of the actual extension of “water”, we could deliberately intend the non-actual extensions of “water” to be everything that is watery. This is for example noticed by LaPorte, who states that “we could go either way” (2004, p. 100) when deciding whether XYZ belongs to the extension of “water”. Putnam also notices that there are two ways to determine non-actual extensions of “water”: in a non-actual world, water is either the stuff that is watery in that world, or the stuff that is of the same kind as the stuff that is watery in the actual world (Putnam 1975, p. 231).
This means that every relevant term could, at least in principle, be used in an actuality-independent way, and as a result, if we intend purported non-natural kind terms to have ACDM:s in accordance with (DSI*), it would rule out the possibility of those terms being used in an actuality-dependent way. If a term prefers an actuality-independent ACDM, then that term will in every circumstance be given such a mechanism.

The only way out as I see it is to grant that our dispositions regarding the use of “pencil” have to be formalized according to (DSI). However, this would mean that “pencil” is (meta)semantically on par with purported natural kind terms like “water”. We could also imagine the above scenario involving erasers or staplers, or in principle any artefact instead of pencils; this would mean that “eraser” or “stapler”, as well as “pencil”, belong to the same semantic category as “water”. A similar conclusion as the above is drawn by Putnam: “When we use the word ‘pencil’, we intend to refer to whatever has the same nature as the normal examples of the local pencils in the actual world. ‘Pencil’ is just as indexical as ‘water’ or ‘gold’.” (Putnam 1975, p. 243).

It also seems that this account could be extended even further. “Bachelor” is used by Haukioja as a paradigm example of an actuality-independent term; this means that “bachelor” does not have an ACDM that conforms to (DSI). But what if it turns out that there is something more about bachelors than just being unmarried men? Perhaps bachelorhood is caused by some structural, or in other ways non-trivial, property that is unknown to us? It is not obvious that “bachelor” would remain in its synonymy-like relation with “unmarried man” in such a case. Again, Putnam draws a similar conclusion:

Couldn’t it turn out that pediatricians aren’t doctors but Martian spies? Answer ‘yes’, and you have abandoned the synonymy of ‘pediatrician’ and ‘doctor specializing in the care of children’. It seems that there is a strong tendency for words which are introduced as ‘one-criterion’ words to develop a ‘natural kind’ sense, with all the concomitant rigidity and indexicality. In the case of artifact-names, this natural-kind sense seems to be the predominant one. (Putnam 1975, p. 244)

Thus, it turns out that the category of terms with an ACDM that conforms to (DSI) contains more terms than just those intended to name natural kinds. Even though we do not intend “pencil” to pick out a natural kind, our uses of the term, derived from the intuitions concerning the above thought
experiment, indicates that we have to formalize the semantic intentions con-
cerning “pencil” along the lines of (DSI). This means that on a semantic (or
metasemantic) level, “water” is on par with “pencil”. If one wants to object
to the conclusion of this thought experiment and at the same time hold on to
the intuitions regarding Twin Earth and twin water, one has to explain why
the intuitions regarding the pencil-organism thought experiment should be
disregarded, while the intuitions about Twin Earth and twin water should
be trusted.

One might object by saying that there is indeed a difference in our se-
mantic intentions after all; surely, we do not intend the term “pencil” to
pick out a kind with an underlying realizing property in the same way as
we intend “water” to do. However, we have to carefully distinguish between
our semantic intentions on the one hand, and our beliefs concerning these
intentions on the other. Remember that we have characterised semantic in-
tentions as dispositions to use terms in particular ways. That is, a semantic
intention is not explicitly an articulated and aware intention, and especially
not an intention directed towards semantic and metasemantic theories. Sim-
ilarly, the intuitions put to light by various Twin Earth thought experiments
are not really intuitions about semantic and metasemantic theories; rather
they are intuitions concerning our use of certain terms. We might not be-
lieve that “bachelor” or “pencil” are names of kinds with proper realizing
properties, but if this turns out to be the case, then these terms would be
actuality-dependent, meaning that the proper realizing properties function
as non-actual applicability conditions. Thus, a speaker may have intuitions
regarding semantics proper, which do not reflect how she actually uses the
terms in question.

In fact, if my reasoning is sound, this could be seen as a feature of the
notions of disjunctive semantic intentions and actuality-dependence, rather
than a flaw; it simply turned out that there is in fact no semantic category
of natural kind terms, but a slightly larger semantic category of terms whose
applicability conditions are determined partly by the actual world.

To sum up this section, the account presented here would place purported
natural kind terms like “water”, “gold” and “tiger” in the same semantic
category as purported terms for artefacts like “pencil” and “eraser”, as well as
other kind terms like “bachelor” or Putnam’s “pediatrician”. The conclusion
is thus that there is no special semantic category of natural kind terms;
but, given that there are dispositions to use some terms in accordance with
(DSI), there is a semantic category constituted of terms whose ACDM:s are
dependent upon the actual world.

5 Conclusion

We have seen that the problem of reference failures seriously undermines the notion of actuality-dependence. I went through three suggestions on how to solve this problem, and argued that they are unsatisfactory. First, the idea to make actuality-dependence a completely a posteriori matter was shown to be conflicting with the idea of actuality-dependence being a consequence of speakers’ semantic intentions. Also, this account made semantics completely dependent on metaphysics in a problematic way. Second, I considered a suggestion that made actuality-dependence completely determined by semantic intentions. This suggestion had to bite the bullet of reference failures, but by adopting a descriptivist (or in other ways non-externalist) ACDM for conditions of actual applicability, reference failures could be shown to affect only non-actual applicability. I argued that this move was still highly problematic, since the importance of non-actual applicability cannot be neglected.

I also considered a third way of which the notion of actuality-dependence could escape the problem of reference failures. By ascribing disjunctive semantic intentions to speakers, a term that is primarily intended to be actuality-dependent is given conditions for non-actual applicability even if the term fails in picking out the right sort of kind. But, as I argued above by relying on one of Putnam’s thought experiments, this puts typically non-natural kind terms like “bachelor” and “pencil” as semantically on par with paradigm examples of natural kind terms like “water”. If my reasoning is sound, this way to conceive of actuality-dependence is in conflict with Soames’ second requirement on a notion of kind term rigidity.

Should the idea of actuality-dependence be dismissed on these grounds? The third solution to the problem of reference failures—that of disjunctive semantic intentions—seems to me to be the most promising. Indeed, it does avoid the metaphysical and epistemological issues that posed problems for the other suggestions I considered. This means that the disjunctive semantic intentions account is not obviously problematic in itself, the problem is the conflict with Soames’ second requirement. Whether one should hold on to Soames’ second requirement or the notion of actuality-dependence is something I will not consider at length here. But as I remarked above, the fact that actuality-dependence, constructed in the sense captured in (DSI), might
apply to terms other than typical natural kind terms, could be seen as a feature, rather than a flaw. Thus, the failure of the actuality-dependence theory to single out natural kind terms as semantically special could be seen as yet another reason to reject the idea of there being a special semantic category consisting of natural kind terms.

**References**


