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Varieties of Context-Dependence*

Abstract: An adequate theory of context-sensitivity must take into the account the fact that several properties of linguistic signs are somehow context-dependent. In this paper I begin by sketching the functional approach to context-sensitivity, i.e. the account which combines the abovementioned observation with the idea of the *parametrization of context*. Next, I compare briefly the functional taxonomy of contexts with two other classificatory approaches presented in the recent philosophical literature. Finally, three concepts of derivative context-dependence are introduced and briefly discussed.

Key words: context, context-dependence (derivative character of context-dependence)/(functional approach to context-dependence), context-sensitivity, semiotic property, indexicality

1. Introduction

By *the value of a semiotic property of an expression x* we mean an entity which stands in a given semiotic relation to the expression x (and, sometimes to the expression x and its user). This use of the term “semiotic value” consciously departs from its functional sense – we are not assuming that an expression stands in a given semiotic relation to at most one entity. To give some examples: the value of the semiotic property of having an intension as applied to the sentence “Chicago is large” is the proposition *that Chicago is large*; the value of the semiotic property of conversationally implicating something as applied to the sentence “John has three daughters” is (among other things) the proposition that *John does not have four daughters*; the value of the semiotic property of having an

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illocutionary force as applied to the sentence “I hereby promise to spare your life” is that of having the illocutionary force of a promise; the value of the semiotic function of expressing the state of the utterer as applied to the sentence “I am not excited, damn you” would be the utterer’s state of being angry etc. I will assume throughout that most semiotic functions can be described in such a relational way.

The purpose of what follows is to present a certain theoretical approach to the context-sensitivity of linguistic signs and their semiotic properties. The intuitive motivation for this approach consists of two truisms about expressions. First, linguistic signs have many types of semiotic – i.e. syntactic, semantic and pragmatic – properties.¹ Second, many of those properties are *somehow* context-dependent, i.e. there are certain expression-types such that the values of their semiotic properties vary depending on the circumstances of their use.

My aim in this paper is to sketch some theoretical concepts which can be used in an analysis of various types of context-sensitivity. My plan is first to make some general remarks about the concept of context-dependence, and second, to introduce three notions of *derivative context-sensitivity* which one may consider as useful tools in analyzing the many varieties of context-dependence

For more than one reason the issues discussed in this paper are related to the fashionable discussion between contextualism and minimalism. Nevertheless, I would like to stress that this paper is not a voice in this discussion and – in particular – should not be interpreted as a defense of a contextualist position of any sort. Its origins lie in rather more general considerations concerning the notion of *context-dependence*.

2. Context-sensitivity

The simplest possible examples of distinct context-sensitive semiotic

¹ Below, I am using the term „semiotic” in its traditional Morris-Carnap sense. Throughout this essay the terms “semiotic/syntactic/semantic/pragmatic property” and “semiotic/syntactic/semantic/pragmatic function” will be used as synonyms.

functions are those of truth value (extension of sentences) and truth conditions (intensions of sentences). There is an infinite number of sentence-types which have different truth conditions and truth values when used on various occasions – narrowly conceived indexical sentences provide an excellent case in point. Nonetheless, those two examples are only a drop in the ocean of others. Consider the sentence:

(1) Typhoid fever is a terrible sickness.

Among its semiotic properties one may consider a particular syntactic structure (with the variable binding operator [universal quantifier] and compound sentential function), intensional and extensional structure,² illocutionary force (usually that of assertion, but the sentence can be used also with other illocutionary forces), potential implicatures and presuppositions, various kinds of pragmatically conveyed information (e.g. that, in the normal assertive use, the speaker believes in what is said by (1)). The list, of course, is far from complete. Some of those properties can be assigned to sentence-types, while others to particular uses (or utterances) of sentence-types. The syntactic structure of (1) is an example of the first sort. On the other hand, unless the sentence is interpreted as tenseless, its truth conditions, truth value, as well as intensional and extensional structure are features of particular utterances of (1). If (1) is interpreted as tenseless, then all those features can (probably derivatively) be assigned to the sentence-type also.³ If (1) is given a tenseless interpretation, all of these

² “Intensional structure” in the sense of C.I. Lewis (1943-44) and Carnap (1947), “extensional structure” in the sense of Ajdukiewicz (1958) (for a more comprehensive formulation see also: Ajdukiewicz (1967a) and (1967b) reprinted in Pelc (1979). Both ideas have recently been reinvented by proponents of the so-called “structured propositions”.

³ There is an interesting general problem noted by authors such as Bar-Hillel (1954) and Prior (1969). One may either take a semiotic property of a given expression to be a feature of expression-types, provided that in each circumstance the expression has this property unchanged (and treat all the semiotic properties to be primarily features

properties, except syntactic structure, are context-sensitive.

An important theoretical approach to context-sensitivity (dating back to the work of Bar-Hillel, Scott and Montague) is based on the idea of a *parametrization of context*. Every linguistic expression somehow determines the set of parameters that must be specified in order to assign to the expression a specific semiotic property (of which its intension – the proposition expressed – is a paradigm example). Thus, in case of (1), if the semiotic functions in question are that of intension, extension, and intensional and extensional structure, the set of parameters simply consists of the time of utterance. If other functions are taken into account, parameters such as the speaker's beliefs and presuppositions must also be included.

It is convenient to think about this way of representing contexts in terms of the general notion of *maximal pragmatic context*: the set of all possible parameters that may determine a particular type of semiotic property of an expression. The paradigmatic example is once again that of intension for which the maximal pragmatic context consists of parameters like the speaker, the addressee, the time of utterance, the place of utterance, the pointing gesture (directing intention) of the speaker, shared beliefs of the participants of the conversation, the co-text of the utterance etc.⁴ Thus, the sentence:

(2) I am glad to see you.

of utterances or uses), or – like Strawson – claim that there is a categorical difference between things which can be said about expression-types and utterances of expression-types. This problem deserves detailed and separate analysis which must be postponed for a further occasion. For the sake of this essay, I will assume the correctness of the first approach.

⁴ One may imagine languages in which parameters like the height above sea level or the air-pressure could also be relevant. The fact that only some aspects of the communicative situation are systematically exploited by actual languages suggests a deep connection between human cognitive organization and linguistic competence.

selects as relevant parameters of the maximal pragmatic context: *the speaker, the addressee* and *the time of utterance*, while the sentence:

(3) I am glad to see Bob, Garry and Hillary on my list.

selects *the speaker, the time of utterance* and the *default subject-matter*.

In both cases, the actual context determines the values of the selected parameters, which – together with widely conceived linguistic rules and fixed facts about the utterance – determine the proposition expressed (the intension of the sentence). The final determination might be more or less indirect depending on the nature of linguistic rules involved. The rule for the first-person pronoun identifies the referent with the value of the speaker coordinate, while the rule for adverbs like “yesterday” requires more complicated “computation” of the reference. Thus:

(4) <“I am glad to see you”,
 c[the speaker: Barack Obama;
 the addressee: Dmitry Medvedev;
 the time of utterance: 7th of July 2009]>

expresses the proposition that Barack Obama is glad to see Dmitry Medvedev on the 7th of July 2009, while:

(5) <“I am glad to see Bob, Gary and Hillary on my list”,
 c[the speaker: Barack Obama;
 the default subject-matter: the president’s cabinet;
 the time of utterance: 20th of January 2009]>

expresses the proposition that, on the 20th of January 2009, Barack Obama is glad to see Bob Gates, Gary Locke and Hillary Clinton on the list of the members of Obama’s cabinet.

A similar analysis can be applied to other cases. Let us take for

instance particularized implicatures. Let us imagine that sentence (2) is uttered to some participant of the New York City Marathon by his coach, and that the participant finished the marathon in the last place. It is therefore plausible to assume that the Maxim of Quality is somehow broken and that (2) must conversationally implicate something. But what exactly is implicated is a complicated and highly context-dependent matter. It may be irony, it may be an allusion to the fact that the coach bet some money on the addressee of (2) and it may be both. Moreover, the way in which the sentence is uttered determines also the attitude of the coach towards the addressee of (2). Accordingly, the utterance of (2) may pragmatically entail that the coach is angry, and that the performance of the addressee is the cause of his anger. It is therefore not only figurative content that is context-dependent, but also the expression of the mental state of the speaker. In all those cases, factors such as the speaker's beliefs and more or less conventional ways of expressing them can play the role of a relevant contextual parameter.

3. Towards functional taxonomy of contexts

The approach to context-dependence sketched above can be labeled "functional". Instead of speaking of context *simpliciter*, it speaks about context *qua* determinant of a particular semiotic property (e.g. context *qua* determinant of extension, context *qua* determinant of intension, context *qua* determinant of intensional structure, context *qua* determinant of illocutionary force etc.). Kinds of context are distinguished in virtue of being relevant for the determination of a specific semiotic property. Since contexts are used by agents to determine particular properties of an utterance, proponents of the functional approach may speak equivalently about the typology of uses of context as well as the typology of contexts. This account contrasts with non-functional approaches which distinguish different types of contexts and context-dependence by recourse to criteria which are not necessarily related to the nature of a particular semiotic feature of linguistic signs. Such non-functional criteria may appeal to the

distinction between systematic and unsystematic kinds of context-dependence, or to aspects of context exploited in the interpretation (in this sense one may speak for example about personal, time- and place-relative types of contexts). Most work on context-sensitivity combines functional and non-functional approaches (rightly, I believe). The subtle differences between particular theories of context-sensitivity often consist in the emphasis they put on functional and non-functional properties of language use.

Let me now characterize briefly two approaches to the issue of the taxonomy of contexts – one basically functional and the other basically non-functional. As we shall see, both contain important observations which must be taken into consideration by every adequate theory of context-dependence.

The best example of a *mostly* functional approach to context-dependence can be found in John Perry's work (see for example: Perry 1997, 1998 and 2001). Perry draws a distinction between three types of contexts (or uses of context), labeled as “pre-semantic”, “semantic” and “post-semantic”.

By a “pre-semantic use of context” Perry means whatever it is that we use to “figure out [in] which meaning a word is being used, or which of several words that look or sound alike is being used, or even which language is being spoken”. To this list one may add the syntactic structure of an expression uttered. In this sense, the interpretation of the utterance:

(6) Lenin figured out Stalin a lot faster than Trotsky.

depends on our previous determination of the logical form (deep structure) of sentence (6). In this instance, we contextually use historical knowledge about so-called *Lenin's Testament* to determine the intended syntax of (6).

By a “semantic use of context” Perry means non-accidental uses of the situation in which the utterance occurs, i.e. uses forced by the meaning

or function of particular words or subutterances. This type of context use directly determines the content of an utterance – indexical, anaphoric and cataphoric uses of particular words provide an excellent case in point.⁵

A post-semantic use of context (also, perhaps more aptly, called “content-supplemental use of context” (cf. Perry 2001: 44-50) is characterized by Perry as the case in which “we lack the materials we need for the proposition expressed by a statement, even though we have identified the words and their meanings, and consulted the contextual factors to which the indexical meanings direct us”. This concept is used by Perry to isolate the phenomenon of *unarticulated constituents* – cases in which content is determined by context but no analogous determination is present at the level of relevant linguistic items which simply do not occur in the utterance (a large part – if not the whole - of that phenomenon falls under the traditional heading of *ellipsis*). Utterance (5) could be analyzed in this manner – a list is usually a list of *something*, and some presuppositions made by participants of the communicative situation in which (5) occurs determine that it is a list of members of Obama’s cabinet rather than a list of people who accepted Obama’s invitation to a private party celebrating his presidential nomination. This interesting typology of contexts is *mostly* functional, because the difference between semantic and post-semantic uses of context applies to the way in which content is determined rather than to the type of semiotic property determined (in both cases it is the proposition expressed). But one may easily transform this typology into a functional one without losing the insight of Perry’s observations. The following table provides an illustration of the direction in which the functional characteristics might go – it starts with the semiotic property which is supposed to be context-sensitive, then groups together several sorts of dependence under a common heading:

⁵ Perry also distinguishes between automatic/intentional, and wide/narrow types of semantically used contexts. Those distinctions are not relevant to the present discussion.

Semiotic function determined	Type of the use of context
<i>Syntactic structure</i> (e.g. Flying planes can be dangerous.)	Pre-semantic use of context
<i>Meaning</i> (e.g. John has many fashionable habits.)	
<i>Language belonging</i> (e.g. CAR TO CAR ⁶ .)	
<i>Proposition expressed</i>	Semantic use of context (e.g. I am hungry.)
	Post-semantic use of context (e.g. Mary began a book.)

We have to be careful in developing the typology sketched in the table. One may expect for example that the notion of *post-semantic use of context* should be naturally extended to conversational implicatures (cf. Recanati 2007: 7), which - according to the classical account – are calculated on the basis of literal meaning (what is said). Indeed, in some sense, implicatures

⁶ In writing, the Polish word „car” means „tsar”, while „to” means „is” – so the whole (written) expression means: “A tsar is a tsar”. The difference in Polish and English readings is recognizable only in pronunciation.

are decoded post-semantically, and context-sensitivity of figurative content must be in this sense post-semantical. But it is not post-semantical in the sense in which the determination of unarticulated constituents is. This is because the basis of computation - the literal meaning itself – is a category covering both the content determined in a semantical way and the content determined in a post-semantical manner. It is the literal content of an utterance that is contextually determined both in the case of classical indexicals (a semantic use of context) and unarticulated constituents (a post-semantic use of context). Although the contextual determination of both unarticulated constituents and figurative content is performed after the semantic interpretation of an utterance has been completed, the sense of “post-semantical” is different in each case. Paraphrasing Russell, we may say that the case of implicatures is a new beast for our contextual zoo. Let us therefore call this new beast a “pragmatic use of context”.

Another interesting example is that of Carnapian intensional structure.⁷ Intensional structure of an expression is the structure isomorphic to its (deep) syntactic structure with intensions of atomic (terminal) elements substituted for their corresponding linguistic items. This property of expressions is sometimes determined by its context-sensitive syntax,⁸ sometimes by its context-sensitive content, and, in still other cases, by both of them.⁹ This shows that intensional structure conceived as a semiotic feature of expressions cuts across the distinction between pre-semantic and semantic uses of contexts. In light of this, our table should evolve and take the following form:

⁷ A similar analysis applies to the extensional structure in Ajdukiewicz’s sense.

⁸ Let us ignore for a while the important question of the relation between this semiotic feature and its compounds.

⁹ The question whether the content determined in the latter case could be the result of the post-semantic use of context is controversial. A positive answer would probably lead to the consequence that the *syntax* of an expression may be (indirectly) determined by the post-semantically used context. This result may be conceived as an argument against including the semantic values of unarticulated constituents in the intensional structure.

Semiotic function determined	Type of the use of context
<i>Syntactic structure</i>	Pre-semantic use of context
<i>Meaning</i>	
<i>Language belonging</i>	
<i>Intensional structure</i> (e.g. He believes that flying planes can be dangerous.)	
	Semantic use of context
<i>Proposition expressed</i>	
	Post-semantic use of context
<i>Proposition implicated</i>	Pragmatic use of context (e.g. I am glad to see you.)

This evolutionary stage of our chart is of course a very first step in the direction of an exhaustive functional typology of contexts. Its aim is only to point in the direction of where such a typology should go.

Let me now turn to a second taxonomy of contexts proposed in the recent philosophical literature. In his stimulating book *Reflecting the Mind*, Eros Corazza proposed to distinguish *narrowly* and *broadly* conceived

context (Corazza 2004: 54-58). By *narrow context* Corazza means this part of the circumstance in which an utterance occurs that helps the participants of the communicative situation to understand widely conceived indexical expressions used in the utterance. There are two types of narrow context: *indexical* and *demonstrative*. The concept of *indexical context* applies to the non-intentional or speaker-independent features of the communicative situation – the place, time, the agent etc. The concept of *demonstrative context* applies to the speaker-dependent (or intentional) features of the communicative situation, like (widely conceived) pointing gestures together with other aspects which are responsible for determining a particular object as the default referent.¹⁰ By *broad context* Corazza means all those aspects of the situation of an utterance which are not explicitly exploited in the semantical rules governing the interpretation of the utterance and its subutterances, but which nevertheless help us to understand the utterance. To use Corazza's example: being dressed in a particular way may help us to determine whether by a particular use of the word "bank" in the utterance of "I have just come from the bank" one means the financial institution or the embankment. This fact about the situation of utterance is not systematically represented in the meaning of the word "bank", and this contrasts with the case of indexicals where the relevant contextual parameter is more or less (*vide* demonstratives) explicitly mentioned in meaning rules governing the interpretation and reference-fixing procedures. Both types of context go into the making of the general category of *setting* – "a scene or scenario underlying the linguistic interchange".

Corazza's notion of *broad context* is theoretically very interesting,

¹⁰ Corazza does not explicitly mention such cases. Nonetheless, I think that they should be classified as demonstrative contexts, unless one would like to separate demonstrative uses accompanied by a gesture from demonstrative uses in which the object of reference is somehow default but no (widely conceived) gesture is present. For example, if, after watching the 100-meter dash won by Usain Bolt, someone says "This sprinter is as good as Carl Lewis" (without producing a gesture of any sort), he means Usain Bolt – the sprinter singled out by the situation.

partly because it allows us to mark an important distinction between *using context as a determinant of a particular semiotic property* and *using a particular semiotic property as an auxiliary tool in determining the content (or any other feature) of an utterance*. For example, Perry's pre-semantic context is something used to determine the language, syntax and meaning of particular strings of sounds or inscriptions. Of those three features, at least language-relativity can be both determined contextually and used contextually as partially determining the content. Thus the inscription "Ich" could be the first person pronoun of German, in virtue of the fact that it appears in some of Goethe's original poems (*language-belonging determined contextually*), while the *presupposition* that it is used as a German word determines that a particular proposition is expressed by the use of "Ich" (*language-belonging exploited contextually*).

Corazza's typology is not functional in character – it applies only to uses of context *qua* determinant of content. This is, of course, a justified approach, since communication is certainly centered around this particular feature of utterances. To this the proponent of the functional approach adds that we must not ignore other context-sensitive features of expressions, and must, among other things, do justice to the Austin-Grice revolution. It should also acknowledge the dual role of semiotic properties which is clearly brought into light by Corazza's account. The fact that unstable presuppositions about the character of particular semiotic features can serve as context-determinants (of other semiotic features) makes the functional approach even more interesting – it is function that allows us to make the distinction between *using context as a determinant of a particular semiotic property* and *using a particular semiotic property as an auxiliary tool in determining some other semiotic properties of an utterance*.

4. Three concepts of derivative context-dependence

Can the multitude of semiotic properties and the multiplicity of context uses be somehow simplified? According to a moderate reductive strategy,

one may single out a set of basic context-dependent semiotic properties and a set of derivatively context-dependent semiotic properties.¹¹ The relevant notion of *derivative context-dependence* is of course far from univocal - I believe that it can be understood in at least two ways, one which may be called *definitional* and the other which may be labeled *relational*. To those two concepts one may add a third, which, although interesting in its own right, is not, strictly speaking, relevant to the issue under discussion. Let us label this third notion *analytical* and begin our presentation with it

We can say that a particular linguistic construction (expression) is *analytically derivatively context-dependent* with respect to another linguistic construction (expression) if and only if: (i) the former is analyzed in terms of the latter; (ii) the latter is context-dependent; (iii) the context for the analysans is not fixed by the analysis.¹² Thus, for example, if an analysis of knowledge ascriptions or statements describing causal relations contains counterfactual statements which are (as is widely assumed) context-sensitive, it follows directly that the knowledge ascription or statement about causal dependence is context-sensitive *unless the analysis somehow fixes the context for the relevant counterfactual*.¹³

¹¹ This strategy should not be confused with the approach which postulates a set of basic context-dependent *expressions* like that of Cappellan, Lepore (2005). The strategy of Cappellan and Lepore differs also from the functional perspective in treating the basic set of indexical expressions as a basis for the elimination of other contextual phenomena rather than their reduction .

¹² We are assuming that analysis is something *general*, i.e. common to all particular instantiations of the analyzed construction, otherwise a trivial occurrence of an indexical expression in the analysis of a *particular* sentence would make this sentence derivatively context-dependent.

¹³ Another example of analytical derivative context-dependence could be provided by the case of knowledge ascriptions combined with the theory that presupposes the context-sensitivity of belief attributions (like that of: Stalnaker (1999): 150-166; Stalnaker's theory deserves special attention because of the subtle difference between *contexts* and *derived contexts* and the stress laid on the dual role of context in determining the proposition expressed). The relation of the functional approach to

It is important to appreciate the meaning of constraint (iii). Thus, for example, Stanley criticizes philosophers who may:

(...) think that there is a *prima facie* case to be made, from the fact that a certain term *t* contains in the analysis of what it expresses a property that is expressed by a context-sensitive term *t'*, that *t* is therefore context-sensitive. (Stanley 2004: 132)

Stanley uses the examples of the context-insensitive expressions like “John's enemy” and “vacuum”. They contain, respectively, (explicitly or in the analysis) the context-dependent terms “enemy” (“in one context it may mean an enemy of *x*, and in another context, an enemy of *y*”)¹⁴ and “empty” (“the notion of being a vacuum involves being completely empty”). In both cases either the form or the analysis of the expression fixes, in the relevant respect, the interpretation of the phrase. Thus, in the case of “John's enemy” the relevant subject is explicitly mentioned, and in the case of “vacuum” the adjective “completely” determines the standard of emptiness that must be taken into consideration. As a result the context-dependence of “John's enemy” and “vacuum” is cancelled out.

As I have mentioned above, the concept of *analytically derivative context-dependence*, as applying to linguistic contexts and constructions rather than features of expressions, does not bear directly on the problem of reducing the number of context-dependent semiotic properties. Matters are different in the case of *definitionally derivative context-dependence*. In this case we assume that there are situations in which one context-dependent *semiotic function* could be, at least partially, defined in terms of other context-dependent *semiotic functions*. As in the case of the first notion of

Stalnaker's notion of *context set* deserves independent study which must be postponed until a later time.

¹⁴ This example, although provides a good illustration of the general problem, is by itself problematic – the relational sense of a certain noun phrases (e.g. „the/a wife of *x*”, „the/a enemy of *x*”, „the/a dog of *x*” etc.) semantically requires a complement to be given. This complement is sometimes default in the conversation and – due to this fact – remains unmentioned. It does not follow, from this fact alone, that the relevant noun-phrases are context-dependent.

derivative context-dependence, we have to assume here that a definition does not fix the context for the *definiens*, otherwise Stanley-like criticism applies to arguments to the effect that some *definiendum* is context-dependent because its *definiens* is. Roughly speaking, a particular semiotic property is *definitionally derivatively context-dependent* with respect to another semiotic property if and only if: (i) the former is defined in terms of the latter; (ii) the latter is context-dependent; (iii) the context for the *definiens* is neither explicitly nor implicitly fixed by the definition.

Paradigm examples of *definitionally derivative context-dependence*, namely the intensional structure in Carnap's sense and extensional structure in Ajdukiewicz's sense, have already been mentioned. Others include structured meanings of various kinds and the truth value of sentences. Structured semantic values (intensions, extensions, meanings etc.) are definitionally derivatively context-dependent both with respect to the (unstructured) semantic value of the whole expression and the syntactic structure of the expression (provided that: (i) compositionality holds, i.e. two expressions identical with respect to the structure and semantic values of terminal elements are identical with respect to their semantic values *simpliciter*; (ii) the syntactic structure happens to be context-dependent). In the case of truth value (extension of sentences), the definitionally derivative character of its context-sensitivity is the effect of the possibility of defining the concept of truth partially in terms of the relation of reference, which, when applied to natural languages, must be contextually relativized.¹⁵ In any case, those semiotic functions which are definitionally derivatively context-dependent can either be excluded from the functional analysis of contexts or it must be proved that their context-sensitivity does not come down to the context-sensitivity of their constituent semiotic features.

The third concept of *derivative context-dependence*, the *relational*

¹⁵ The other component of the definition is satisfaction relation which depends rather on circumstances of evaluation; if one thinks that it is also context-sensitive, she can add that the truth value is doubly derivatively context-dependent in the discussed sense.

one, is modeled on the notion of *supervenience*, or more precisely, on the notion of *asymmetric covariance*. On any account using this notion of *derivative context-sensitivity* we assume that some semiotic properties of expressions (as uttered on particular circumstances) may co-vary with other semiotic properties of the very same expressions-*cum*-contexts. The former properties are supervenient properties of an expression-*cum*-context, while the latter – subvenient properties of the expression-*cum*-context. Indiscernibility of subvenient properties entails indiscernibility of supervenient properties. Moreover, this dependence should be *asymmetrical* – the indiscernibility of previously supervenient properties should not entail the indiscernibility of previously subvenient properties.¹⁶ This condition allows us to exclude uninteresting cases of interdependent semiotic functions. For example, some theorists, e.g. Bar-Hillel, Carnap (1952) introduce the notion of *semantic information* defined as a set-theoretical complement of the intension of the sentence. The interdependence of those semiotic properties is theoretically unimportant, moreover we should probably treat them as definitional variants of a single semantic property. Asymmetric dependence allows us to exclude cases of this sort.

Let us use the following notation: we shall write ‘ $\langle \alpha, c \rangle$ ’ for “expression-type α as uttered in context c ”; ‘ $\langle \alpha, c, w \rangle$ ’ for “expression-type α as uttered in context c and possible world w ”; and ‘ $\langle \alpha, c \rangle !_F \langle \beta,$

¹⁶ Some people would probably be inclined to treat with ontological seriousness the idea that semiotic functions are properties and take them on a par with all properties that are more or less constantly present in our philosophical and scientific theorizing about the world. Thus, she would be disposed to reject the semiotic eliminativism and instrumentalism – claims presupposing that semantic, pragmatic, and (even) syntactic features of linguistic signs are not real properties at all. Moreover, such a person would probably (intend to) use the term “supervenience” as designating the relation of dependence seriously conceived as metaphysical dependence. I prefer to speak about “asymmetrical covariance” –without excluding metaphysically uninteresting kinds of dependence, such as functional ones. Below I will be using “supervenience” in this more liberal sense.

c^* ' for "expression-type α -cum-context c is identical, with respect to the semiotic property F , with expression-type β -cum-context c^* " (and similarly with the possible world argument).¹⁷ Depending on which concept of *supervenience* is our model, we have at least two sets of postulates for this notion of *derivative context-dependence*:

[Weak relational derivative context-dependence [WRD] –first formulation]

Semiotic property D is derivatively context-dependent with respect to semiotic property B iff:

(a)

$$\{ \langle a, c, w \rangle \vdash_B \langle a, c', w \rangle \mid \langle a, c, w \rangle \vdash_D \langle a, c', w \rangle \}$$

(b)

$$\{ \langle a, c, w \rangle \vdash_D \langle a, c', w \rangle \mid \langle a, c, w \rangle \vdash_B \langle a, c', w \rangle \}$$

This definition requires that identity with respect to semiotic property B entail identity with respect to semiotic property D (but not *vice-versa*) *within* every possible world. Thus, we allow the possibility that the identity with respect to B-properties *across* possible worlds does not entail the identity with respect to D-properties across those worlds. A good example is provided by the case of extension and intension of expressions. Two expressions having the same intension when used in two contexts of the same possible world would have the same extension in that world. Meanwhile that would not generally be the case across possible worlds – identity of intensions in different possible worlds does not entail identity of extensions in those possible worlds. It is because the facts about possible

¹⁷ The approach sketched in this paper could be restated, without theoretical loss, in the terminology of occurrences – “mere combinations of the expressions with contexts” (cf. Kaplan 1989: 584-585).

worlds may differ, e.g. even if the sentence “She lives in Warsaw now” expresses in two possible contexts identical propositions about Monica Bellucci, Paris and 25th of January 2009, in one world Monica Bellucci can live in Paris on this particular date, while in another (on the very same date) she can (hopefully!) live in Warsaw.

[Strong relational derivative context-dependence [SRD]]

D is derivatively context dependent with respect to B if and only if:

(a)*

$$i \ w_i \ w' \ i \ a_i \ c_i \ c' \ \{ \langle a, c, w \rangle ! _B \langle a, c', w' \rangle \ H \langle a, c, w \rangle ! _D \langle a, c', w' \rangle \}$$

(b)*

$$j \ w_j \ w' \ j \ a_j \ c_j \ c' \ \{ \langle a, c, w \rangle ! _D \langle a, c', w' \rangle \ W \langle a, c, w \rangle \ " _B \langle a, c', w' \rangle \}$$

This definition requires that identity with respect to semiotic property B entail identity with respect to semiotic property D (but not *vice-versa*) across two possible worlds. This does not hold for the aforementioned case of intension-extension, unless we explicitly substitute the property of having-a-particular-extension-in-a-possible-world for the property of having-a-particular-extension-*simpliciter*. In the case of such substitution [SRD] generally holds, since the relevant extensions would always be extensions with respect to the same possible world. A similar strategy would also allow us to answer the problem of the changing domains of potential values of some semiotic functions (relatively to possible worlds).

A moment’s reflection on both versions of the extension-intension example shows clearly that our definitions should be refined. Although we have obvious cases of relational derivative context-dependence, both are, in some sense, trivial. This is because the derivative character of context-dependence is a consequence of the functional and (so to speak)

“contextless” relationship between both semiotic functions. To exclude cases of this sort we have to add to our definitions the condition which states that the semiotic functions in question do not simply depend on each other:

(c)

$$j a j b \{ a ! _B b W a " _D b \}$$

Thus we have three general concepts of relational derivative context-sensitivity. A trivial one, i.e. one for which the negation of (c) holds. In this case we can simply omit conditions (a)/(a)* and (b)/(b)* – since the derivative character of context-dependence consists in the functional dependence expressed by the negation of (c). However, it does not mean that this notion of derivative context-dependence is not useful. On the contrary, it allows us to simplify the functional approach to context-dependence by considering, in the first place, only those semiotic properties which are not interdependent in the sense stated by the negation of (c). One can easily observe that in this sense (assuming that compositionality for subvenient semiotic properties holds) intensional structure is a very strong semiotic feature – semiotic functions of having an intension, having an extension and having an extensional structure are all trivially derivatively context-dependent with respect to intensional structure. We have also two non-trivial concepts of relational derivative context-sensitivity, i.e. weak relational derivative context-dependence conjoined with (c) and strong relational derivative context-dependence with (c).

Unfortunately, the definitions of non-trivial versions of [WRD] and [SRD] are still not satisfactory. Let B' and D' be semiotic properties satisfying the negation of the condition (c) (D' is trivially derivatively context-dependent with respect to B'). Let B and D be properties that are context-insensitive and independent (both $j a j b \{ a ! _B b W a " _D b \}$ and $j a j b \{ a ! _D b W a " _B b \}$ holds for B and D). We can introduce two

new semiotic properties defined respectively as: $P ! (B \text{ d } B')$ and $Q ! (D \text{ d } D')$. Since B and D are context-insensitive, conditions (a)/(a)*, (b)/(b)* and (c) hold for P and Q . Nonetheless, this sort of derivative context-dependence is also trivial – it is inherited from the functional dependence of B' and D' and the context-insensitivity of B and D . We have two options here: one is to allow the applications of the refined definitions only to atomic properties, the other is to add to the definition a further condition which states that the relevant complex semiotic features cannot be the intersections of non-empty collections of sets, collections which exhaustively divide into two classes: the class of context-insensitive and independent features and the class of trivially dependent features (satisfying the negation of condition [c]). In the latter, we have to extend also the concept of trivial relational derivative context-dependence to situations analogous to the one exploited in the argument above.

At any rate, one may have general doubts concerning the application of non-trivial variants of [WRD] and [SRD]. *Prima facie* all those concepts correspond to some purely theoretical possibility. Nonetheless, I think that it is convenient to have such a conceptual tool up one's sleeve. Our contextual zoo is full of surprises.

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