Words in Contexts
Fregean Elucidations

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1. Introduction

The question I am interested in in this paper is "How do words obtain their meanings?"[1] The author I shall ask for help in answering this question is Gottlob Frege. This may appear surprising, since Frege is known as not being interested in the question posed. Frege wanted to provide mathematics with solid foundations. To achieve this, he aimed at constructing from scratch logical systems that model mathematical reasoning with unprecedented precision.

Frege started what came to be known as the logicist programme with arithmetics around 1880. After he received the famous letter from Russell in 1902, he became convinced that his program was doomed to failure. Frege had supposed that the fundamental primitive notions underlying his system (like 'object', 'concept', 'function', 'extension', 'truth', ...) do have a sufficiently clear meaning. It turned out that Frege was wrong on this[2], but it is debatable whether conceptual confusions were really responsible for the failure of his program. Anyway, in his later writings Frege became more conscientious about the interpretation of primitive terms in both theoretical and meta-theoretical contexts. In my search for an answer to the question how words receive their meanings, I shall make use of Frege's rather scattered but clear-sighted remarks on this topic. I try to do this without addressing the problem of what exactly these meanings are supposed to be.

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[1]I would like to thank the participants of the Konstanz Workshop on 'Methods for the interdisciplinary analysis of the lexicon' held in June 1998, as well as Gottfried Gabriel, Theo M.V. Janssen and Martin Stokhof for valuable hints and comments on an earlier version of this paper.

[2]Otherwise, according to his own, Euclidean idea about axioms (1906, pp. 295-296; *KS* p. 283; *CP* 295; and 1914, *PW* 247, *NS* 267, *SLS* 160-161), he could not possibly have suggested an axiomatization that leads to a contradictions.

More specifically, I shall base much of my considerations on a few passages taken from lesser known writings of Frege, works that are not primarily concerned with matters of the philosophy of language: On an exchange of letters with David Hilbert in 1899 (published only in 1940/41) and the indirect result of that exchange: two series of papers on 'The Foundations of Geometry' (published in the *Jahresbericht der Deutschen Mathematiker-Vereinigung* of 1903 and 1906), as well as a posthumously published manuscript on 'Logic in Mathematics' (written 1914, first published in 1969). I shall finally draw on Frege's only paper on the philosophy of physics, a discussion note called 'On the Law of Inertia' (published in 1891).

My discussion of Frege's views is not in the first place meant to be an exercise in philosophical exegesis, and it is not an end in itself. It will lead me to a sketch of how two quite different projects of interpreting linguistic expressions and practices can be seen as complementing each other: the atomistic, piecewise methodology of formal semantics and the holistic, large-scale approach that is common in the disciplines concerned with *Verstehen*, like parts of literary theory, history and sociology.[3] The former methodology is cautious in its theoretical aims and claims, the latter is bold. The former has as a paradigm sentences such as 'A cat is on the mat', the latter sentences such as 'The only basis for a good marriage is romantic love.'[4] I try to outline a way in which these enterprises can be seen as complementing each other. Of course there are more interpretive enterprises or methodologies that lie between these two very crudely described extremes. Still I hope that the picture that I shall offer at the end of this paper may give an idea of how different aspects of interpretation hang together and how a division of labour in work on the lexicon might work.

2. Definition versus elucidation

In the context of the Fregean program of developing mathematics on sound logical foundations, there are two different ways in which words get their meanings: By definition or by elucidation ('*Erläuterung*'[5]). In a

[3]Of course I do not wish to deny that these disciplines have 'harder' parts in which they try to minimize or even eliminate the contribution of scarcely controllable processes of *Verstehen*.

[4]Thanks go to Michael Morreau and Ekkehard König for bringing these examples into the discussion.

[5]Sometimes, 'Erläuterung' gets translated into 'explication' (in 'On the Foundations of Geometry: Second Series', *Collected Papers*, pp. 300-301) or into '(illustrative) example'

definition, a term is introduced as having exactly the same meaning or sense as a combination of old terms the meaning or sense of which is known. The defined term must be new to the language at hand, or else, if it is an old term, we must realize that through the definition it acquires a fresh meaning and transmutes into a technical term that only looks like the old familiar one. According to Frege, definitions are conventions, stipulations, or just abbreviations. If handled properly, they play an important but totally unproblematic rôle in the system of science. In an *elucidation*, on the other hand, an (old or new[6]) term is rather loosely characterized in a way that makes essential use of (a) either ordinary, unregimented language with its vague, imprecise and unstable expressions, or of (b) other terms of the scientific object language the meaning of which has not yet been fixed precisely.

Towards the end of this paper I want to claim that lexicographers—as persons dealing with the meanings of words—are in fact concerned with elucidations, elucidations of a roughly Fregean kind. In order to avoid misunderstandings, we need to mark this claim off against some other well-entrenched philosophical jargon. First, when Kant spoke of *Erläuterungs-urteile*[7] he had in mind "analytical judgements" that are true in virtue of the meanings of the words occurring in them. Thus Kant's *Erläuterungsurteile* cannot be contrasted with definitions; many of them just *are* definitions. Secondly, when Quine mentions lexicography, he does so mainly in his discussion of definitions.[8] For Quine, lexicographers are empirical scientists recording facts of synonymy antecedent to the exposition they—the lexicographers—give. Again the idea is that of a precise definition, not the vaguer one of an elucidation.[9] So when we say that it is

(in 'Logic and Mathematics', *Posthumous Writings*, 1979, p. 207). The latter translation certainly is very misleading.

[6]Elucidations may characterize the meaning of old terms when these are used in a new, more precise way, or the meaning of new terms that have been obtained as an irreducible result of logical analysis. For the latter case, cf. Frege (1892, p. 193).

[7]*Critique of Pure Reason*, B11. *Erläuterungsurteile* ('elucidatory judgements') analyze or split up (*auseinander setzen* B9, *zergliedern* B9, B11) concepts; they are contrasted with *Erweiterungsurteile* ('ampliative' or 'expansive' judgments) that extend our knowledge.

[8]Quine (1951, Section 2, "Definition"; 1953; 1973).

[9]It seems that what Carnap (1945, 1950) and Hempel (1950) called *explication* is closer to the Fregean idea of elucidation. An explication in their sense not only paraphrases the definiendum but refines or supplements its meaning. However, Carnap (1950, p. 3) does insist that the "explicatum must be given by explicit rules for its use, for example, by a definition which incorporates it into a well-constructed system of scientific either logico-mathematical or empirical concepts."

the business of lexicographers to provide elucidations, we are not endorsing the well-known teachings of either Kant or Quine.

Elucidations are really *very* different from definitions. First, elucidations need not be conceived completely verbal. But even when they are fully articulated in language, they should, according to Frege, by no means be confused with definitions. He in particular argues at length against the sort of explanations that Hilbert used in his 1899 book on the *Foundations of Geometry* (those *Erklärungen* that have later usually been called 'implicit definitions'[10]). For Hilbert, the meanings of the set of basic geometric terms 'point', 'line', 'plane', 'lie', 'between' etc is defined (or "explained") simultaneously through a system of axioms in which these terms occur. For example, Frege was convinced that Hilbert's presentation was based on a dangerous confusion of the functions of definitions and axioms in mathematics. In a letter to Hilbert written a few days before the turn of the century, we find Frege's first mentioning of a third category of sentences which he called elucidations (*Erläuterungen*):

> One can also recognize a third kind of proposition [besides definitions and 'other propositions', i.e. axioms, fundamental laws, theorems, HR], elucidatory propositions, but I would not want to count them as part of mathematics itself but refer them to the antechamber, the propaedeutics. They are similar to definitions in that they too are concerned with laying down the meaning of a sign (or word). Thus they too contain something whose meaning cannot be assumed to be known in advance, at least not completely and beyond doubt, perhaps because they are used in the language of life in a fluctuating way or in many senses. If in such a case the meaning to be assigned is logically simple, then one cannot give a proper definition but must confine oneself to warding off the unwanted meanings among those that occur in linguistic usage and to pointing to the wanted one, and here one must of course always rely on being met half-way by an intelligent guess.[11]

A considerable part of the writings of the later Frege is devoted to a passionate fight against Hilbert's idea that the meaning of terms can be *defined* by the axioms of a theory.[12] Frege would not have minded Hilbert

[10]The notion of an implicit definition dates back to Gergonne (1818-19). Frege, in (1906, pp. 306, 388-390, 402, 424; *CP* 305, 319-321, 332-333, 335; *KS* 292, 305-306, 317, 319) and in (1914, *NS* 268-270, *SLS* 162-165, *PW* 248-250), calls Hilbert's explanations 'pseudo-axioms'.

[11]Letter of Frege to Hilbert, dated 27/12/1899, *WB* 63; *PMC* 36-37.

[12]Explicitly in two series of articles 'Über die Grundlagen der Geometrie' (1903, 1906). Equally explicit passages can be found in 'Logik in der Mathematik' (1914), see in particular *NS* 229-230, 263-269, *SLS* 106-107, 156-163, *PW* 212-213.

using "explanations" in a sort of propaedeutic antechamber that is independent from, or preparatory to, the building of a formal system. But for Hilbert explanations (i.e., implicit definitions) are more than that. They form an integral part of his geometric theorizing,[13] and his geometric proofs build this sort of explanations. Although like elucidations qua language and content, explanations are given an essential function within Hilbert's system.

For Frege, in contrast, the only admissible determination of meaning in formal theories is through explicit definitions. Elucidations are framed in a language that he views as deficient, and if we use them, we badly depend on 'being met half-way by an intelligent guess' [*entgegenkommendes erratendes Verständnis*[14]]. Elucidations only *elucidate* the meanings of words, but they do not and cannot possibly *define* them. They only prepare the ground for truly scientific work.

Frege's main objective was to build up a formal system for mathematics the primitive terms of which are supposed to be understood clearly and distinctly. Once the primitive terms are understood, there would be not problem of understanding compound expressions, since the *principle of compositionality* is supposed to be valid:[15]

> The meaning of large linguistic complexes is determined by the meaning of small linguistic units and the meaning of elementary grammatical operations combining these units.

We must realize very clearly that Frege is primarily interested in building logico-mathematical theories, and as such he is not interested in elucidations.[16] But we are. So how do elucidations lay their propaedeutic groundwork? In particular, how do they confer meanings on the terms elucidated? I shall try to outline an answer to these questions in the next section.

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[13]Frege even called them 'corner-stones', see (1906, p. 302; *KS* 289; *CP* 301).

[14]Letter of Frege to Hilbert, 27 December 1899 (*WB* 63, English translation in *PMC* 37).

[15]The principle is certainly very Fregean in spirit, and it has been termed 'Frege's Principle' by many linguists and logicians. However, as Janssen (1996, p. 421) points out, Frege does not seem to have stated compositionality *as a principle* in any of his writings. Compare footnote 33 below.

[16]It is striking that Frege thinks that elucidations are of a somewhat lesser status because they 'only' serve for the purposes of communication between investigators, and solipsistic researchers would not need them. Frege does not tell us why he thinks that communication between scientists is less important than logical system-building. Compare the long quotation of Frege in Section 3 below.

3. Compositionality, context, charity

Frege was of course well aware that there are primitive, undefinable notions in his work: notions like 'object', 'concept', 'function', 'truth', etc that play a central rôle in his logico-mathematical (meta-)theories. And, of course, primitive notions cannot be defined in these theories. But I submit that except for their belonging to a discourse with somewhat more casual terminological standards, elucidations can be understood in a way that should be perfectly legitimate for Frege. The key here is, in my view, Frege's famous *context principle*, of which I only give a rough reformulation and generalization:[17]

> The meaning of small linguistic units and the meaning of elementary grammatical operations can only be determined in the context of large linguistic complexes.

Frege realized clearly that terms like 'object', 'concept', 'function' or 'truth'—technical terms for him—are characterized *only* by the rôle they play in his theories, that is, by what he says about them in the numerous passages in his writings that are phrased in ordinary language. Frege does not even mind the fact that these fundamental terms are therefore bound to be vague, imprecise or metaphorical. *Theoretically*, he says, there is no way to exclude serious misunderstandings of his elucidations, but *practically*, elucidations do achieve their goal almost always. This is because we can

[17]This version of the context principle must be taken with a grain of salt. First, when speaking of the determination of meanings, I leave it open whether this is a metaphysical claim about the existence of meanings or an epistemological claim about our knowledge of meanings (thanks to Theo Janssen for pointing this out). Second, the present formulation is actually a generalization of Frege's in that it refers to small and large linguistic expressions in general, rather than to the particular relation between words and sentences. — The only piece of work where Frege explicitly endorses the context principle are the *Foundations of Arithmetic*, as one of the three fundamental principles mentioned in the Introduction: "The meaning of a word must be asked for in the context of a proposition, not in isolation." Or in § 60: "But one must always keep in mind a complete proposition. Only in a proposition do the words really have a meaning. ... It is enough if the proposition as a whole has a sense; its parts thereby also obtain their content." and § 62 "Only in the context of a proposition do words mean something." Finally, it is also mentioned in the conclusion, § 106. (Translations taken from Michael Beaney, ed., *The Frege Reader*, Oxford: Blackwell, 1997.) Although there is strong evidence that Frege never gave up the context principle, this question is a controversial one. See, e.g., Dummett (1995).

rely on a 'meeting of minds' or a 'cooperative understanding', on researchers who are prepared to take elucidations 'with a grain of salt.'[18]

I want to suggest that the context principle must be invoked in order to understand how elucidations can confer meanings to words. Cooperative readers first try to sympathetically understand Frege's writings, look what rôle the primitive terms play in his theory, and finally take these rôles to determine their senses. But Frege has another principle, equally important as the context principle: the principle of compositionality (which we have already mentioned). Now in an obvious way, the idea of compositionality seems to run counter to the context principle. Whereas the latter says that the meaning of words can only be determined from an antecedent understanding of the sentences in which they occur, the former has it just the other way round.[19] The question is: What comes first, the parts or the whole, the understanding of words or the understanding of sentences? This looks exactly like the problem of the hen and the egg.

Or doesn't it? I have said that the context principle states that the meaning of words can *only* be determined from the meaning of the sentences in which they occur. Compositionality (in the formulation given above) says that the meaning of sentences can be determined from the meaning of the words which occur in them. The 'only' of the formulation of the context principle is missing. We are safe if we have independent access to the meaning of sentences. I now want to argue that we indeed have.

We need to leave the narrow field of the interpretation of single judgements and their parts now, and enter the stage of the large-scale understanding not just of particular chunks of texts of a certain size, but of entire patterns of linguistic and extra-linguistic behaviour. What we do when we *understand*, I submit, is project our own understanding of language, world, and the relation between language and world onto large samples of utterances of speakers and writers. We must not expect that we can always take another person's utterances literally. There are always bound to be some failures of understanding, and if we try to understand

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[18]See the long quotation below.

[19]I should point out that I am here glossing over the central Fregean distinction between *Sinn* and *Bedeutung*. My use of the terms 'sense' and 'meaning' is supposed to be neutral. While this is problematic in principle, it does not seem to be important for my present concerns. There has been much discussion in the literature as to whether Frege's introduction of the *Sinn*/*Bedeutung* distinction in 1892 has invalidated the context principle that is explicitly formulated and endorsed only in the *Foundations of Arithmetic* of 1884. However, there is evidence that the context principle (some form of) never lost its importance in Frege's work. Compare again Dummett (1995).

distant cultures or epochs, a literal understanding will scarcely be available at all—for the simple reason that the language under consideration is obviously very far removed from the language spoken by the interpreter.

It is a fact that people are busy *making sense* of one another all the time, and they succeed in doing so most of the time. They achieve understanding by letting the scope of their attention transcend individual speech acts, and instead focus on all-encompassing patterns of linguistic practice, embedded in historical epochs, societies and cultures. We make sense of people who are, to some greater or lesser extent, foreigners to us. How do we succeed in bridging the gap between different linguistic or cultural frameworks? We can do this by presuming that, by and large, speakers and writers are coherent and rational subjects. That is, they are, by and large, like us. Less provocatively and more specifically, we choose to interpret the totality of a speaker's or writer's linguistic products in such a way that truth and appropriateness—as judged by the interpreter's lights—get maximized. The task of an interpreter is this: To assign meanings to words in such a way that the *interpretandum* taken as a whole meets, to a maximal degree, all criteria of perfection that we can think of.[20] Translating and understanding foreign languages—and even your neighbour's language is a foreign language to some extent—means projecting one's own understanding of the world onto the other.

All this is not always strictly speaking true. We need to take into account known differences in information and perspective. It simply does not make sense to interpret a text from the middle-ages as "really" dealing with relativity theory — even if on such an interpretation the text would be more perfect than on any alternative interpretation. And it does not make sense to deny that some religious community, say, declares women to be inferior to men when it literally says so — even if we know that this is stupid and we would like to grant alternative religions the benefit of doubt. Meanings are not negotiable to such an extreme extent. If we have good textual or external evidence to the contrary, the charitable presumption that a speaker or writer is maximally rational must be given up.

Despite these reservations, it is evident that the picture I have just drawn is inspired by the *principle of charity* that plays a decisive rôle in Quine's and Davidson's teachings about (radical) translation and (radical)

[20]We need to be aware of the fact that higher satisfaction of one criterion of perfection may only be obtained at the cost of a lower satisfaction of another criterion. If we want to maximize the number of truths in someone's statements, this may only be possible on pain of ascribing some inconsistencies, and vice versa. See Rott (1998).

interpretation.[21] Let us mention here that similar ideas have long been around in traditional philosophical discussions; they belonged, for instance, to the lore of German enlightenment hermeneutics in the 18th century.[22] And surprisingly, we can also find the idea of charitable interpretation quite explicitly in Frege's published reaction to Hilbert's architecture of the foundations of geometry. Here we meet again with elucidations:

> The purpose of explications [*Erläuterungen*] is a pragmatic one; and once it is achieved, we must be satisfied with them. And here we must be able to count on a little *goodwill* and *cooperative understanding*, even *guessing*; for frequently we cannot do without a figurative mode of expression. But for all that, we can demand from the originator of an explication that he himself know for certain what he means; that he remain in agreement with himself; and that he be ready to complete and emend his explication whenever, given even the *best of intentions*, the possibility of a misunderstanding arises.
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> Since the mutual cooperation in a science is impossible without mutual understanding of the investigators, we must have *confidence* that such an understanding can be reached through explication, although theoretically the contrary is not excluded.
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> ... If Hilbertian definitions were to serve only the mutual understanding of the investigators and the communication of the science, not its construction, then they could be considered elucidations [*Erläuterungen*] in the sense noted above and could be accorded all the *consideration* to which as such they could lay claim. But they are intended to be more. It is not intended that they belong to the propaedeutic but rather that they serve as corner-stones of the science: as premises of inferences. And given these demands, they cannot be accorded the *leniency of judgement* which they could have demanded as mere elucidations. ..
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> Let us turn to proper definitions! They, too, serve mutual understanding, but they achieve it in a much more perfect manner than the elucidations in that they leave nothing to *guess-work*; nor need they count on *co-operative understanding* and *goodwill*. ..."[23]

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[21]For a good formulation of how both normativity and the dependence on the speaker's/writer's point of view enter into principles of charitable interpretation, see Lewis (1974, p. 112) and Dennett (1981, pp. 17-18).

[22] See Scholz (1998) and Rott (1998).

[23]Frege (1906, 301-302; *KS* 288-289; the quotation is from *CP* 301-302, all emphases added by HR). Note the unforced change from 'explication' to 'elucidation' as translations of the single Fregean term '*Erläuterung*'. The original German words for the italicized expressions are, respectively: 'guten Willen', 'entgegenkommendes Verständnis', 'Erraten', 'gutem Willen', 'Vertrauen', 'Nachsicht', 'Milde der Beurteilung', 'Erraten', 'entgegenkommendes Verständnis', 'guten Willen'. One of the first hints in the literature that these notions are indeed important for Frege is given in an unassuming little paragraph by van Heijenoort (1967, p. 326).

Although this striking passage certainly does not justify the conclusion that Frege endorsed charity in interpretation *as a principle*, we may say that he saw clearly that charity is indeed necessary in order to understand elucidations. For Frege, however, definitions and elucidations still belong to two different classes of scientific distinction. It is strange that he does not further push the question of what the source of the meanings of the primitive concepts is—concepts that cannot gain their meanings through definitions.

4. Enlarging the context: beyond judgements

In order to see that the level of sentences may be transcended in the fixation of meanings and that we sometimes do take resort to the level of systems of sentences (or more generally, theories or texts), let us start with an example. Hilbertian explanations form a system of implicit definitions which determine (partially determine, constrain) the meaning of primitive terms in the same way as the value of n algebraic variables can be determined (partially determined, constrained) by a system of n (or less than n) algebraic equations. Frege vehemently objects to the use of such a procedure in scientific theory-building, since it leaves in the dark whether meanings exist, and if they exist, whether they are unique—just as in the case of systems of algebraic equations.[24]

For an illustration by analogy, consider the three following systems of equations

(1a)	$y = x^2$	(2a)	$y = x^2$	(3a)	$y = x^2$
(1b)	$y = x - 1$	(2b)	$y = x - {}^1/_4$	(3b)	$y = x$

System (1) (i.e., (1a) plus (1b)) has no solution, system (3) has two solutions (viz., $x = y = 0$ and $x = y = 1$). System (1) fails to achieve anything, system (3) only *constrains*, but fails to *determine*, the values of the variables. Only system (2) uniquely determines ("implicitly defines") the values of x and y as ${}^1/_2$ and ${}^1/_4$, respectively. But although this system does succeed in determining the "meaning" of the variables, there are two objections against using system (2) as a method for determining meanings

[24]The parallel between systems of definitions and systems of algebraic equations is explicitly drawn by Frege in 'Über die Grundlagen der Geometrie' (1903, p. 370, *CP* 279-280, *KS* 268) and in 'Logic in Mathematics', (1914, *PW* 249-250, *NS* 268-270, *SLS* 162-165).

that could be raised. The objections are very different. First, the method is not *explicit* because one cannot *see* whether the determination succeeds. There is no qualitative difference between (1) and (2) and (3) that would account for the success of one and the failure of the others. This would be a Fregean objection.[25] Secondly, the system (2) succeeds only if we may take it for granted that we understand the primitive mathematical objects denoted by '1' and '4' and the primitive mathematical operations of adding, subtracting, dividing, and squaring, respectively denoted by the symbols '+', '–', '/', and '^{2}'. And so far we have not come up with a good explanation of how we achieve such an understanding. But this is not a complaint that Frege would utter as a genuine objection. This problem, the problem that any interpretation has to start with the understanding of some primitive symbols, is irremediable, and it is a problem that Frege is—willy-nilly—ready to acknowledge and put up with. It is, however, of a more fundamental kind than the first complaint since it cannot be eliminated by turning implicit definitions into explicit ones.[26]

In the previous section we have formed a first idea as to how the principles of context and compositionality work together in the interplay between sentence meanings and word meanings. The way we formulated the principles, however, has not been restricted to the word-sentence level, and charity in interpretation indeed starts from much larger units or patterns of linguistic expression. It is instructive to see what position Frege, who was extremely reluctant to let "soft" elements infect his work, took with regard to a more comprehensive contextualization of meaning and understanding.

The obvious place to look for is the last paper that Frege published in his lifetime, entitled 'Compound Thoughts' (1923). Although the title looks promising, there is little to gain from this paper for our purposes. Frege analyzes the sentential connectives 'and', 'not … and …', 'neither … nor …', and 'or' in the truth-functionally compositional way that nowadays is familiar to everyone who has taken a first course in propositional logic. Frege deliberately abstains from analyzing the usage of these sentential

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[25]Frege would not, however, outright deny that (2) qualifies as reference-determining. Compare Frege (1906, p. 386; *KS* 303; *CP* 317): "I do demand the solvability of a system of principles as to the unknowns occurring in it, and an unambiguous solution, if this system of so-called principles is supposed to be a definition that assigns references to the unknown signs."

[26]It is not clear to me whether Frege realized that the context principle or some similar holistic idea must be employed in determining the meaning of primitive concepts. This fact seems to run counter to Frege's desire of making everything explicit and rest on secure foundations.

connectives in natural language, and there is no sign of acknowledgement that the meaning of them might or should in any way depend on the context.[27]

So, is there nothing in Frege's work that suggests that the context principle is not only applicable to the sentence-word interface, but also to the transition form larger products of linguistic activity to sentences? There is not much to be found in Frege, but I think one can show that he was very well aware of the significance of wider contexts indeed. In his only paper on the foundations of physics, he explicitly recognizes that the hypotheses (i.e., sentences) isolated from their embedding in a scientific theory are just as devoid of meaning as words isolated from the sentences in which they occur.

What is at stake in that paper is the meanings of words in the context of a physical theory. What it means that a body is 'in motion' or 'at rest' cannot be settled by measurements of time and space alone, but such a statement has empirical content only if the law of inertia is (pre-)supposed to hold. Frege argues that Newton's laws of motion, and the concepts of mass and force are given "a sense" only through the law of inertia. Newton's hypothesis about absolute space and time and the law of inertia have "meaning only as a whole".[28] Frege says explicitly that dividing the system

[27]How do we know what a "compound thought" means? By knowing what the compounds themselves mean, and what the connective means, so says the compositionalist. But how do we know what a connective means? Let me give an example. Dutch is very close to German, but it is a language of its own. One striking difference concerns the use of the particle 'om' (similar to the German 'um' and the English 'in order to') followed by an infinitive construction. Often, the particle is an indication of purpose:

> Hij neemt de fiets *om* op tijd bij de trein te zijn.
> [He takes the bike *in order to* be at the train in time.]

This is just as it is in German. In Dutch, however, 'om' plus infinitive is used much more frequently in places where an ordinary infinitive would perfectly do:

> Ik vind het moeilijk *om* dit te weigeren.
> [I find it hard *to* refuse this.]
> Haar besluit *om* niet mee te gaan kwetste hem diep.
> [Her decision not *to* come along hurt him deeply.]

Here there is no purpose expressed by the 'om'-clause. But how do we know this? I submit we know this because a purposeful interpretation simply does not make sense. We know this because we understand that the sentence headed by 'om' does not express anything like a purpose motivating the fact described in the main clause. The larger context helps determining the meaning of the word 'om'.

[28]Frege (1891), pp. 146-148. It is plausible to assume that Frege's use of 'sense' and 'meaning' in this text is well-reflected; his famous article 'Über Sinn und Bedeutung' appeared in 1892, the year after the paper on the law of inertia.

of Newtonian hypotheses (including the laws of motion, as well as the Law of Universal Gravitation) into separate parts leads to defects in the understanding of individual physical concepts like 'interaction'. Thus we have found a piece in Frege's works that demonstrates quite precisely how scientific theories taken as wholes bestow meanings on each single theoretical term.[29]

Now these formulations sound surprisingly similar to Hilbert's method of "explanations" that we have illustrated by the analogy with algebraic equations. It is, however, doubtful whether Frege would have wanted to transfer the situation that he diagnoses for a physical theory to the field of mathematics. Evidence against this can be gathered from his resolute dismissal of the idea that the Euclidean axiom of parallels does not have any sense independent of "the whole (the formal theory ...) whose dependent part" it is (1906, pp. 402-403, *KS* 317, *CP* 333).

5. Interpretation as reconstruction

We have seen that Frege, although mainly interested in the enterprise of constructing formal-logical systems, acknowledged the importance of assigning meanings to concepts by splitting up judgements or theories in parts. Besides the respectable work of the *Aufbau* of a scientific theory there is also the *Zerlegung* of linguistic practices, besides synthesis there is analysis. The meaning of words can be understood by analyzing the judgements in which they occur (and applying certain modes of abstraction to them), and the meaning of a judgement in turn depends on the meanings of the primitive words and rules of composition by which it is built up.

When we try to understand speakers or writers—what exactly is it that we want to understand? When we aim at making sense of linguistic

[29]Incidentally, it is in the application of abstract mathematical theories to physical appearances where the necessity of "a certain measure of good will and tactfulness" is mentioned for the first time—in a letter of Hilbert to Frege, dated 29 December 1899 (see Frege 1895-1903, *WB* 67, *PMC* 41). One can only speculate as to whether Frege picked up these terms (or the similar terms mentioned above) from Hilbert's letter. — Another interesting aspect of their correspondence is that Frege briefly airs the dependence of the meaning of individual judgements on larger theoretical contexts in a letter to Hilbert dated 6 January 1900: "It also seems to me that there is a logical danger in your speaking of, e.g., 'the parallel axiom', as if it was the same thing in every special geometry. Only the wording is the same; the thought content is different in every different geometry." (*WB* 75, *PMC* 48) It is not clear to me, however, whether this passage positively expresses Frege's own point of view or whether he rather uses this line of thought as a sort of reductio argument against Hilbert's axiomatic method.

products—where exactly does our interpretation start? Putting these questions is asking for the primary units of meaning and significance. I want to make a case for the claim there is no simple and straightforward access to pre-given meanings of small linguistic units. Such meanings are the products of the all-comprehensive enterprise of interpreting the speakers and writers of a certain language. We start making sense not of short pieces of text, but of (oral) utterances in situational contexts, of (written) texts in (written) linguistic contexts, of collections or sequences or patterns of such utterances and texts, and—ultimately—of persons and societies, epochs and cultures.[30]

But can't we avoid turning to large texts or patterns of linguistic behaviour, and begin instead by considering the meaning of small parts? I do not think so. The most promising method for establishing small portions of linguistic performance as the primary bearers of reference and meaning are so-called ostensive definitions. However, considering the nature of Frege's primitive terms—highly abstract mathematical, physical or metatheoretical concepts such as 'object', 'concept', 'function', 'extension', and 'truth' —it is evident that ostension cannot play a major rôle in his work.[31]

The principles of context and compositionality collaborate in the overall process of interpretation. This process starts with large, encompassing contexts (empirical patterns of speech acts) and tries to understand them in terms of small parts (lexicon and grammar) that may be pieced together in a recursive way. The cyclical character of interpretation is represented graphically in Figure 1. Of course, going full circle once will not usually be enough. Having failed to square the observed behaviour with the predictions, the interpreter will start a new round in order to minimize residual differences. In so far as progress can be achieved in repeated attempts at interpretation, it is justified to speak of a hermeneutic *spiral* rather than a hermeneutic *circle* .

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[30]If we were to view the natural sciences as an interpretive enterprise as well, we could say that we make sense of the world, the universe and *everything*.

[31]Elucidations were employed in a way similar to Frege in Wittgenstein's philosophy of language, in particular in *Tractatus* 3.263: "The meanings of primitive signs can be explained by means of elucidations. Elucidations are propositions that contain the primitive signs. So they can only be understood if the meanings of those signs are already known." It is a controversial issue whether for the early Wittgenstein ostensive definitions were more important for anchoring meanings in reality than for Frege. See the discussion of this question by Ishiguro (1969, pp. 28-34), Hacker (1975), Helme (1979) and Stokhof (1998, pp. 159-176).

Interpretation as Reconstruction, Or:
The Hermeneutic Circle

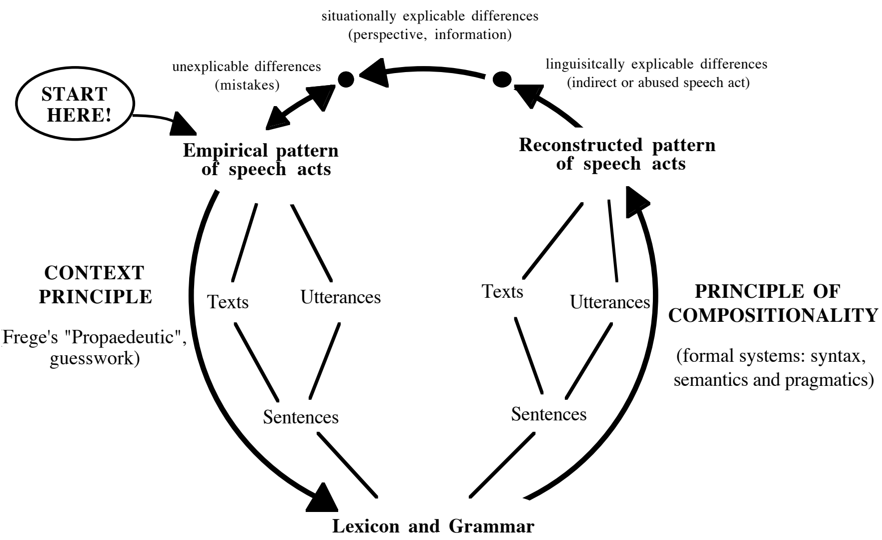

Figure 1.

Let us look at an example that shows how the context principle can be set to work through an argument from charitable interpretation. Consider the following passage from Frege's 'Logic and Mathematics' (*NS* 266, *SLS* 150-160, *PW* 247):

> Can the axiom of parallels be acknowledged as an axiom in this [the traditional, HR] sense? When a straight line intersects one of two parallel lines, does it always intersect the other? This question, strictly speaking, is one that each person can only answer for himself. I can only say: so long as I understand the words 'straight line', 'parallel' and 'intersect' as I do, I cannot but accept the parallels axiom. If someone else does not accept it, I can only assume that he understands these words differently. Their sense is indissolubly bound up with the axiom of parallels.

Here we have a situation in which the hypothetical interpreter—Frege—prefers to reinterpret the terms of a hypothetical speaker—a non-Euclidean geometer—rather than to saddle him up with the supposition that he *really* denies the axiom of parallels. In Frege's eyes, it is more charitable to impute a deviant meaning of the speaker's terms than to impute the rejection of something that has long been considered to be *a priori* true.[32]

The principle of compositionality which is usually taken to explain the possibility of linguistic creativity,[33] now plays the rôle of a constraint on the holistic interpretation process. In order to make languages manageable, we need to split up the whole interpretandum—empirical patterns of speech acts[34]—into parts, namely, the words of a language (the lexicon) and the rules of their combination (the syntax, the grammar). The ideal solution of the problem of interpretation is achieved when we assign meanings to these parts in such a way that we can compositionally reconstruct the meanings of the wholes as assigned (or rather, hypothesized) in the beginning of the interpretation process.

The claim that an interpretation of linguistic behaviour is possible has empirical content, that is, it is a non-tautologous empirical claim. Meanings of words and meanings of syntactic operations are theoretical entities that are existentially quantified over in a Ramsey-sentence formulation of the empirical claim implicit in any interpretation of utterances and texts of a language *L*:

> There are elementary lexical units of L and elementary syntactical (grammatical) operations of L that can be assigned meanings in such a way that the following conditions are satisfied:
> (1) the actual meanings of speech acts and texts of speakers/authors using the language L can be (re-)constructed with the help of these elements in a compositional way (i.e., these meanings can be built up from unit meanings in a manner that exactly parallels

[32]Actually I want to suggest that this could serve as a reasonable definition of *a priori* truths with the help of the principle of charity: A statement *p* is an *a priori* truth (of the [interpreted] language *L*) iff it is more charitable to suppose that someone who denies *p* speaks a language *L*' different from *L*, than to suppose that she really disagrees with *p*'s content (as an *L*-sentence), that is, iff a charitable interpreter prefers to use a non-homophonic translation from *L*' into *L*.

[33]The argument from linguistic creativity can also be found in Frege, see 'Compound thoughts' (1923, p. 36; *LU* 72, *CP* 390) and already in the unpublished manuscript 'Logic in Mathematics' (1914, *NS* 243, *SLS* 126, *PW* 225). In Wittgenstein's *Tractatus*, there is a hint at the same argument, but Wittgenstein explicitly denies that linguistic creativity presupposes that words have meanings in isolation. See the beginning of 4.002: "Man possesses the ability to construct languages capable of expressing every sense, without having any idea how each word has meaning or what its meaning is."

[34]For Frege (except in 'On the Law of Inertia') the interpretanda are smaller: they are presented by single judgements.

the syntactical (re-)construction of the expressions that make up the speech acts/texts in question);

(2) on the interpretations thus constructed, the sentences produced by the speakers/authors are mostly true—or more precisely, the patterns of speech acts taken as a whole are mostly rational (coherent).[35]

Clause (1) reflects the idea of compositionality. Clause (2) makes clear that the ultimate evaluation of an interpretation takes place not at the level of lexicon and grammar, but at the holistic level of very large linguistic products; this clause reflects both the context principle and the principle of charity. There is no conflict between the principles of compositionality and context.[36]

We have now sketched a picture of interpretation as an activity that ascribes a maximum of truth and rationality to the speakers or writers interpreted. The aim is to preserve whole patterns of linguistic phenomena in a way that is both systematic (compositional) and charitable (Frege's "meeting of minds"). Do we also have a place for the variability and flexibility of the lexicon, for any dynamics of interpretation? According to this picture there are two fundamentally different ways in which the lexicon can change. First, the manifest linguistic behaviour may change to such an extent that the discrepancy between observed and reconstructed patterns of speech acts cannot be tolerated any more. It must be accounted for by changes in the theoretical posits of the semantic theory—either in the meaning of words or in the meaning of grammatical constructions. Second, it may happen that although the empirically observable linguistic behaviour does not change at all, semanticists come up with a different theory "rationalizing" the same behaviour. For the lexicographer, there may well be excellent reasons to change the assignment of lexical meanings to words

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[35]The requirement of truth may be overturned by other requirements of rationality (such as internal consistency, or appropriateness in a certain situation) that are considered more important in some special situations. See, e.g., Davidson (1990, 320-321).

[36]In conclusion, I thus disagree with Janssen (1997, pp. 420, 462) who calls the context principle 'incompatible with' and 'the opposite of' compositionality. Stokhof suggests to keep apart two interpretations of the context principle; the stronger (but not the weaker) one is said to appear at odds with the principle of compositionality which 'seems to presuppose the semantical primacy of parts over wholes' (199*, p. 164). This appearance should be resisted, I have argued, because there is no such presupposition. I agree with Bartsch (to appear, galley-proofs, pp. 8-9) who says that the context principle is 'complementary to' and 'the basis of' compositionality, and that they 'supplement each other.' The most famous advocate of compatibilism is of course Dummett (1973, Chapters 1 and 6; 1981, Chapter 15).

without any external pressure deriving from changes in their actual use. The task of making sense of patterns of discourse (let alone the making sense of persons or cultures) does not have a unique solution.[37]

6. Conclusion

How do we come to understand words, words occurring in sentences, texts and utterances? I have sought Frege's help in trying to give an answer to this question. The results of my discussion in this paper are three-fold. First, I have suggested a way of conceiving how the Fregean principles of *compositionality* and *context* can be reconciled and in fact seen as working together in the enterprise of interpretation. Secondly, I have tried to show that another Fregean theme, that of *elucidation*—the elucidation of primitive, undefinable terms of logic, mathematics and metamathematics—secures a place for the context principle in the writings of the late Frege in which no explicit reference to this principle can be found. Elucidations provide a particular striking and important case for the thesis that small linguistic units get a meaning only through the interpretation of larger chunks of linguistic products. Thirdly, when thinking about the functioning of elucidations, we have seen that Frege is compelled to acknowledge a principle of *charitable interpretation*. Prima facie, it seems strange that such a principle should be of crucial importance for the foundations of mathematics, but upon reflection it is not surprising that the language games played by mathematicians must be anchored by the same principles of interpretation as the language games played in any other community of language users. I have argued that there is a deep connection between the three themes,[38] and that not only the first and the second, but also the third one is indeed a Fregean theme.

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[37]Pursuing further the analogy with the way algebraic equations either *determine* or *constrain* the values of the variables occurring in them, it is the latter situation that is similar to the problem of interpretation (cf. the system (3) of equations above). Moreover, the number of unknown variables in interpretation will often exceed the number of equations.

[38]I am inclined to think that it is no pure coincidence that the paragraph on elucidations (3.263) in Wittgenstein's *Tractatus* is immediately followed by the paragraph on the context principle (3.3, generalized in 3.314). It is quite evident that both of these paragraphs owe a lot to Frege.

References

Bartsch, Renate. To appear. Kompositionalität und ihre Grenzen. In A.D. Cruse, F. Hundsnurscher, M. Job und P.R. Lutzeier, eds., *Lexikologie – Lexicology*. Berlin and New York: de Gruyter.

Carnap, Rudolf. 1945. The Two Concepts of Probability. *Philosophy and Phenomenological Research* 5.

Carnap, Rudolf. 1950. *Logical Foundations of Probability*. Chicago 1950.

Davidson, Donald. 1990. The Structure and Content of Truth. *Journal of Philosophy* 87, 279-328.

Dennett, Daniel. 1981. True Believers: The Intentional Strategy and Why It Works. In A.F. Heath, ed., *Scientific Explanation*, Oxford: Oxford University Press 1981. Reference to the reprint in D.D., *The Intentional Stance*, 15-35. Cambridge, Mass.: MIT Press 1987.

Dummett, Michael. 1973. Frege: Philosophy of Language. London: Duckworth.

Dummett, Michael. 1981. The Interpretation of Frege's Philosophy. London: Duckworth.

Dummett, Michael. 1995. The Context Principle: Center of Frege's Philosophy. In I. Max and W. Stelzner, eds., *Logik und Mathematik*, 3-19. Berlin: de Gruyter.

Frege, Gottlob. 1891. Über das Trägheitsgesetz. *Zeitschrift für Philosophie und philosophische Kritik* 98, 145-161. Reprinted in G.F., ed. Ignacio Angelelli, *Kleine Schriften [KS]*, 113-124. Hildesheim: Olms 1967.

On the Law of Inertia. In G.F., ed. Brian McGuiness, *Collected Papers [CP]*, translated by Hans Kaal, 123-136. Oxford: Blackwell 1984.

Frege, Gottlob. 1892. Über Begriff und Gegenstand. *Vierteljahresschrift für wissenschaftliche Philosophie* 16, 192-205. Reprinted in G.F., ed. Günther Patzig, *Funktion, Begriff, Bedeutung*, 66-80. Göttingen: Vandenhoeck und Ruprecht 1962 / 1969.

On Concept and Object. In G.F., ed. Brian McGuiness, *Collected Papers [CP]*, translated by Peter Geach, 182-194. Oxford: Blackwell 1984.

Frege, Gottlob. 1895-1903. Briefwechsel mit David Hilbert. In G.F., eds. G. Gabriel, H. Hermes, F. Kambartel, Chr. Thiel, A. Veraart, *Wissenschaftlicher Briefwechsel [WB]*, 58-80. Hamburg: Meiner 1976. Reprinted in *Gottlob Freges Briefwechsel (Philosophische Bibliothek 321)*, eds. Gottfried Gabriel, Friedrich Kambartel and Christian Thiel, 4-24. Hamburg: Meiner 1980.

English in Gottfried Gabriel et al., eds., *Philosophical and Mathematical Correspondence [PMC]*, abridged for the English edition by Brian McGuinness, transl. by Hans Kaal, 32-52. Oxford: Blackwell 1980.

Frege, Gottlob. 1903. Über die Grundlagen der Geometrie [Erste Serie]. *Jahresbericht der Deutschen Mathematiker-Vereinigung* 12, 319-324, 368-375. Quoted from G.F., ed. Ignacio Angelelli, *Kleine Schriften [KS]*, 262-272. Hildesheim: Olms 1967.

On the Foundations of Geometry: First Series. In G.F., ed. Brian McGuiness, *Collected Papers [CP]*, translated by E.-H. W. Kluge, 273-284. Oxford: Blackwell 1984.

Frege, Gottlob. 1906. Über die Grundlagen der Geometrie [Zweite Serie]. *Jahresbericht der Deutschen Mathematiker-Vereinigung* 15, 1906, 293-309, 377-403, 423-430. Quoted from G.F., *Kleine Schriften [KS]*, ed. Ignacio Angelelli, 281-323. Hildesheim: Olms 1967.

On the Foundations of Geometry: Second Series. In G.F., *Collected Papers [CP]*, ed. Brian McGuiness, Oxford: Blackwell 1984, translated by E.-H. W. Kluge, 293-340.

Frege, Gottlob. 1914. Logik in der Mathematik. In G.F., *Nachgelassene Schriften [NS]*, eds. H. Hermes, F. Kambartel, F. Kaulbach, Meiner, Hamburg 1969. Reprinted in *Schriften zur Logik und Sprachphilosophie. Aus dem Nachlaß (Philosophische Bibliothek 277) [SLS]*, ed. Gottfried Gabriel, Hamburg: Meiner, 1971, 92-165.

Logic in Mathematics. In G.F., *Posthumous Writings [PW]*, translated by Peter Long and Roger White, Oxford: Blackwell, 1979, 203-250.

Frege, Gottlob. 1923. Gedankengefüge. *Beiträge zur Philosophie des deutschen Idealismus* 3, 1923-1926, 36-51. Reprinted in G.F., ed. Günther Patzig, *Logische Untersuchungen [LU]*, 72-91. Göttingen: Vandenhoeck und Ruprecht, 1966, fourth edition 1993.

Compound Thoughts, In G.F., *Collected Papers [CP]*, ed. Brian McGuiness, translated by Peter Geach and R.H. Stoothoff, 390-406. Oxford: Blackwell 1984.

Gergonne, Joseph D. 1818-1819. Essai sur la théorie des définitions. *Annales de mathématiques pures et appliquées* 9, 1-35.

Hacker, Peter M.S. 1975. Frege and Wittgenstein on Elucidations. *Mind* 84, 601-609.

Helme, Mark. 1979. An Elucidation of *Tractatus* 3.263. *Southern Journal of Philosophy* 17, 323-334.

Hempel, Carl Gustav. 1950. Problems and Changes in the Empiricist Criterion of Meaning. *Revue Internationale de Philosophie* 11.

Ishiguro, Hidé. 1969. Use and Reference of Names. In Peter Winch, ed., *Studies in the Philsosophy of Wittgenstein*, 20-50. London: Routledge.

Janssen, Theo M.V. 1997. Compositionality. In Johan van Benthem und Alice ter Meulen, eds., *Handbook of Logic and Language*, Amsterdam/Cambridge, Mass.: Elsevier/MIT Press, 417-473.

Lewis, David K. 1974. Radical Interpretation. *Synthese* 23, 331-344. Reference to the reprint in D.K.L., *Philosophical Papers*, Vol. 1, 108-121. New York/Oxford: Oxford University Press 1983.

Quine, Willard V.O. 1951. Two Dogmas of Empiricism. *Philosophical Review* 60, 20-43. Revised and reprinted in W.V.O.Q., *From a Logical Point of View*, Cambridge, Mass.: Harvard University Press 1953.

Quine, Willard V.O. 1953. The Problem of Meaning in Linguistics. In W.V.O.Q., *From a Logical Point of View*, Cambridge, Mass.: Harvard University Press 1953.

Quine, Willard V.O. 1973. The Vagaries of Definition. *Annals of the New York Academy of Sciences*. Reprinted in W.V.O.Q., *The Ways of Paradox*, 2nd edition, 50-55. New York: Random House 1976.

Rott, Hans. 1998. Billigkeit und Nachsicht. Manuscript. Department of Philosophy, University of Amsterdam.

Scholz, Oliver. 1998. *Verstehen und Rationalität*. Frankfurt a.M.: Vittorio Klostermann.

Stokhof, Martin. 1998. *Ethics and Ontology in Wittgenstein's Early Thinking*. *An Introductory Essay*. Manuscript. Department of Philosophy, University of Amsterdam.

Van Heijenoort, Jean. 1967. Logic as Calculus and Logic as Language. *Synthese* 17, 324-330.

Wittgenstein, Ludwig. 1963. *Tractatus Logico-Philosophicus*. Translated by D.F. Pears and B.F. McGuinness, second impression. London/New York: Routledge and Kegan Paul.