Published in American Philosophical Quarterly 56 (4), 331-334 (2019)

CONCEPT DESIGNATION

Arvid Båve

Abstract

The paper proposes a way for adherents of Fregean, structured propositions to designate propositions (and other complex senses/concepts), using a special kind of functor. Using some formulations by Peacocke as examples, I highlight certain problems that arise as we try to quantify over propositional constituents while referring to propositions using "that"-clauses. With the functor notation, by contrast, we can quantify over senses/concepts with objectual, first-order quantifiers and speak without further ado about their involvement in propositions. The functor notation also turns out to come with an important kind of expressive strengthening, and is shown to be neutral on many central questions.

Introduction

Adherents of structured propositions divide into Fregeans, who take propositions to be composed of senses or concepts, or Russellians, taking them instead to be composed of worldly particulars, properties, and relations. In this paper, I discuss some foundational questions about Fregean propositions. Particularly, I note some problems concerning the most obvious and common way of referring to propositions, with "that"-clauses, and propose a solution consisting in a notation that uses *functors* in its designators of complex concepts (like propositions). This notation, I argue, is clear and neutral in certain important respects, and also affords an important kind of expressive strengthening.

I call constituents of Fregean propositions *concepts*, rather than senses (hence, concepts here are nothing like Frege's *Begriffe*). One reason is that my discussion has relevance far beyond Frege's particular views about propositions. Another reason is that I will not be presupposing any of the more particular views that Frege held about his thoughts and senses, for instance, that names in attitude contexts refer to their customary senses, nor any kind of descriptivism or content internalism.[1] Also, I will be discussing only how to refer to Fregean propositions (for certain purposes), not how to do so from the particular perspective of Frege's semantics.

In Section 1, I lay out my main assumptions about concepts and propositions and present some accompanying terminology. In Section 2, I investigate some formulations found in Christopher Peacocke's *A Study of Concepts* (1992) in order to point to certain general problems with using "that"-clauses in a theory of concepts and structured propositions. In Section 3, I explain how the functor notation solves these problems. In Section 4, I characterize my proposal in some more detail, explain how the functor notation affords a certain expressive strengthening, and point out a number of respects in which it is neutral. (I also argue that, although neutrality is not necessarily mandatory for substantial *views*, it *is* desirable for *terminologies* used to discuss substantial views.) In Section 5, finally, I critically examine two other kinds of designators of complex concepts, "italicized concept-designators" like "the concept *white horse*", and set-theoretic expressions using nested brackets, and conclude that the functor notation is superior in several respects.

1. Preliminaries

The account to be proposed here is predicated on a picture of concepts, which, while controversial, is rather natural and intuitive. On this picture, every concept is either syntactically simple or complex, and complex concepts are formed by some syntactic operation of "conjoining" on its constituent simpler concepts. Complex concepts thus form tree-like structures. I will leave as open as possible what such "conjoining" consists in (personally, I think that there is a real, mental act of conjoining that plays a central role in this theory (see Båve 2017, Section VI), but this assumption will play no role in this paper).

When I say that there is a syntax of concepts, I mean not merely that they are mereologically related. In fact, I do not presuppose that they are mereologically related at all. I merely mean, firstly, that concepts belong to different syntactic categories, such as *predicative, propositional,* perhaps *adverbial*, and so on, and, secondly, that the conjoining of concepts is governed by syntactic rules, to be understood in close analogy with ordinary grammar. Concepts belonging to the syntactic category *propositional* are simply propositions, the objects of propositional attitudes and acts like belief or assertion.

I will refer to *simple* concepts using words in small caps, so that "wise" expresses the concept WISE.[2] I take these terms to function roughly like "the concept *horse*" (minus the apposition), found in lay English. Aside from assuming that they refer to simple concepts, however, I will stay as neutral as to their semantic functioning. While simple concepts are referred to by small-caps concept-designators, the question how to refer to *complex* concepts is the main subject matter of this paper. Occasionally, I will refer to complex concepts by italicizing phrases, as in, "*white horse*". However, while this is a useful heuristic, I argue in Section 5 that, for certain important theoretical purposes, it comes with considerable shortcomings, and, hence, will only be used when the main concerns of this paper can safely be ignored.

I will talk, again as non-committally as possible, of complex concepts *involving* their "constituent" concepts. Thus, the proposition that Mary is wise involves both WISE and MARY. They are also involved in the proposition that possibly, John thinks Mary is wise, although here, they are not *immediately* involved. Involvement must be kept apart from *aboutness* (indeed, we will see that failure to keep them apart is at the root of certain confusions surrounding Fregean propositions that I will address). The relationship between aboutness and involvement can be summarized with a simple example: the proposition that Socrates is wise *involves* but is not *about* SOCRATES, and it is *about* but does not *involve* Socrates (the person).[3] On a Russellian view, by contrast, propositions can be said to involve at least some of the things they are about. For instance, the proposition that Socrates is wise can be said both to involve and be about Socrates.

I will be talking a lot about functors and functions in this paper, so, as a final preliminary, I would like to address a problem with a common use of function-expressions. To wit, certain expressions related to functions (typically the letter "f"), are often used in a syntactically ambiguous way. Since I will myself be criticizing certain formulations made by adherents of Fregean propositions which exemplify this ambiguity, I want to describe and rectify the use I have in mind.

The problem is that the same expression (say, "f") is used both as a *functor* and as a singular term referring to a function. By an (n-adic) functor, I mean an expression, which, together with n singular terms, yields a singular term, as when "+" is conjoined with "0" and "1", to yield the singular term, "0 + 1" ("+" is of type $e/(e/e)$, while singular terms are e). In such an occurrence, "+" cannot itself be a singular term (or a first-order variable). And yet, it is common to find expressions used first as a functor in this sense, and then as a singular term, as in "$F(+)$", where "$F(\xi)$" is an ordinary, monadic predicate. Similar remarks apply to quantifications like,

$\exists f\,(f(a) = b$ and $F(f))$,

or

There is a function f such that $f(a) = b$ and $F(f)$.

The problem with the above sentences is that the occurrences of "f" occupy different syntactic positions. The last occurrence is in the slot of a monadic predicate, hence a term-position, whereas the penultimate occurrence is in functor position, that is, the kind of position occupied by "the capital of …". If we try to combine this expression with a monadic predicate, like "is big", we get garbage like "the capital of is big". Thus, the two occurrences of "f" must be syntactically distinct.

This ambiguity is probably harmless for most purposes, but the present paper concerns details of syntax and of functors, whence we had better root out any possible cause of confusion. Fortunately, there is a straightforward way of avoiding the ambiguity. I will use simple expressions like "f" *only* as functors, in the above sense, and will refer to *functors* using quotation marks and Frege's lower-case Greek letters (to mark argument-places), thus allowing quote-names like

"$f(\xi, \zeta)$".

To *refer to functions*, I will enclose expressions like "$f(\xi, \zeta)$" within square brackets, to form singular terms like "$[f(\xi, \zeta)]$" and "$[\xi + \zeta]$". Thus, the brackets take a functor of any adicity to a singular term. As inferential bridges between sentences containing such function-designators and sentences containing functors, we will use the Conversion Principle,

(CP) $f(x_1, \ldots, x_n)$ = the value of $[f(\xi_1, \ldots, \xi_n)]$ at $<x_1, \ldots, x_n>$,

where "at $<x_1, \ldots, x_n>$" abbreviates, "for $x_1, \ldots, x_n$ (in that order) as arguments". An instance of (CP) is, "+(3,4) = the value of $[\xi + \zeta]$ at arguments 3 and 4".

2. Motivation: a case study of Peacocke's *A Study of Concepts*

The main advantage of using functors to designate complex concepts is the clarity, neutrality, and expressive power it affords. I will be concerned mainly with the advantage of "clarity" in this section, pointing to certain problems with some formulations found in Peacocke's work on concepts, to which the functor notation offers a solution.

More specifically, thanks to the logical form of the expressions this notation uses to denote complex concepts, it allows us to quantify over concepts with ordinary objectual, first-order quantifiers, binding variables that occur within expressions referring to complex concepts. Peacocke's attempt to do this suffer from serious problems pertaining to ambiguity and grammaticality. An important general upshot is that this cannot be done at all if one uses "that"-clauses. I discuss Peacocke's theory mainly for illustration. His theory, and Conceptual Role Semantics more generally, are otherwise of no special relevance. The notation I will propose will be useful to any theory that refers to concepts and has the relevant expressive needs, not merely semantic theories.

Peacocke 1992 holds that concepts can be individuated by their possession conditions, by claims of the form,

(A) WISE is the unique concept *c* such that, necessarily, a person *P* possesses *c* iff …*P*...*c*… (cf. Peacocke 1992, pp. 6, 9).

What should replace the dots, however, is left open, and the various instances of (A) found in Peacocke's work differ significantly. Still, as with any theory individuating concepts in terms of belief, concepts are individuated by reference to *propositions* involving them. A crucial question is thus by which kind of singular term we are to refer to propositions in individuations of concepts.

Of course, (A)-form sentences will not exactly contain singular terms referring to propositions, but rather "open singular terms", expressions had by replacing a singular term *in* a singular term by a variable. Although (A)-form sentences therefore do not typically contain singular terms referring to propositions, their correct formulation still depends on what such singular terms should be like.

Now, to see that there is a problem about proposition-designators in (A)-form claims, consider the most obvious way of filling one out, namely, with "that"-clauses. Consider first an (A)-form claim about the individual concept ARISTOTLE:

(AA) ARISTOTLE is the unique concept *c* such that, necessarily, a person *P* possesses *c* iff *P* believes that *c* is the teacher of Alexander.

(AA) is implausible for many different reasons, but I want to focus on a particular, somewhat formal/syntactic problem. To wit, (AA) is ambiguous in a certain way, and on every reading, it comes out as unacceptable.

Firstly, if we read the variable "*c*" as ranging over concepts, then (AA) claims that the possession condition is that one believe that a (certain) *concept* is the teacher of Alexander, which is clearly absurd (cf. Pautz 2008 and Yalcin 2015, p. 213f.). We might try to rectify this problem by taking the possession condition to be rather that the person takes the concept to be co-referential with the concept *the teacher of Alexander*. But this entails that one cannot possess individual concepts without possessing the concept of a concept and of co-reference, which cannot be right. Thus, the possession condition of ARISTOTLE cannot be that one (be disposed to) believe (or infer with) any proposition *about* ARISTOTLE, but at most one *involving* ARISTOTLE (which, however, will be about Aristotle the person).

Suppose "*c*" is instead taken to range over people, thus making the possession condition in (AA) more reasonable. Then, however, (AA) is trivially false (on the Fregean conception of propositions), since it then says that ARISTOTLE is a person. Finally, we cannot avoid the above dilemma by stipulating that "*c*" function differently in its two occurrences in (AA), for such ambiguity is unacceptable. (AA) does not figure in Peacocke's work, but more complicated claims with the same problems do, notably his possession conditions for the concept *Lincoln Plaza* (1992, p. 110).

Now consider the following individuation of a *predicative* concept:

(AR) RUN is the unique concept *c* such that, necessarily, a person *P* possesses *c* iff, for all *x*, *P* believes that *x c* iff *P* believes that *x* walks quickly.

Peacocke does not make any claim with the kind of problems that (AR) has, but I include this example to illustrate another set of problems arising from using "that"-clauses as proposition-designators.

Like (AA), (AR) is unacceptable for many reasons, but I want to focus on a problem analogous to those discussed above. That is, (AR) is ambiguous, and is unacceptable on every reading. If "*c*" is unambiguously first-order, then (AR) is ill-formed, having a first-order variable in the position of a VP, in "*x c*" (where "*x*" occupies term position). If the variable "*c*" is read as second-order, occupying VP-position, then although "*x c*" is well-formed, some foregoing parts of the sentence is not. For instance, "*P* possesses *c*" is ill-formed, as it will have instances like "*P* possesses runs". A second-order variable cannot saturate one-place predicates or fill in the dots in, "John possesses …" or "RUN is the unique concept …". These problems are fundamentally the same as those afflicting (AA), although manifested differently, due to the difference between singular terms and predicates. (Essentially the same reasoning would apply if "*x*" and "*c*" would switch places, and "*x*" is thought of as functioning like a monadic predicate of first-order logic.)

Peacocke does not always use "that"-clauses to refer to propositions. In one passage, he writes, "If a thinker possesses concept *F*, then necessarily for any suitably lower-level concept *c* […] he is in a position to know what it is for the thought *Fc* to be true […]" (1992, p. 46). Clearly, "*Fc*" is used here as a singular term. On one reading, "*F*" here occupies *functor*-position. But on this reading, one cannot have sentences in which a predicate is conjoined with this variable, as in, "*F* is a concept", since for this to be grammatical, "*F*" must occupy term-position (cf. the disambiguation of Section 1). Also, this idea frustrates the desideratum of quantifying over all concepts with first-order quantifiers.[4]

One might propose a reformulation of (AR) of the form, "RUN is the unique concept [$F(\xi)$] such that, necessarily, a person *P* possesses [$F(\xi)$] iff, for all *x*, *P* believes $F(x)$ iff…". This is well-formed. However, on this reading, firstly, predicative concepts are said to be *functions*, which is a contentious claim. More importantly, this claim is not to the effect that the concept RUN is the concept such that *it* is so and so, for the last occurrence of "*F*" is not within the function-designator-forming brackets.

Finally, Peacocke's formulation of the possession conditions of the concept AND reads,

> Conjunction is that concept *C* to possess which a thinker must find transitions that are instances of the following forms primitively compelling, and must to do because they are of these forms:
>
> $$\frac{p \quad q}{p\ C\ q} \qquad \frac{p\ C\ q}{p} \qquad \frac{p\ C\ q}{q}$$
>
> (1992, p. 6).

This passage, too, is open to several interpretations. In particular, it is unclear how to understand the expression, "*p C q*", occurring in the schematic inference-rules. If "*C*" is here taken to occupy binary-connective position, "the concept *C*" would be ill-formed, as would expressions in which monadic predicates are attached to "*C*", as in, "*C* is a concept".

Let me close this section by considering the possibility of interpreting Peacocke as using the kind of italicized concept-designator mentioned in Section 1. For instance, in the passage quoted above that uses the expression "*Fc*", it could be seen as belonging to the syntactic category of such italicized concept designators. These expressions are special in that each simple italics concept-designator, like "*white*" is a singular term, yet such terms can sometimes be simply juxtaposed to form new, well-formed singular term, such as "*white horse*". To wit, on this interpretation, each of "*F*", "*c*", and "*Fc*" will be singular terms, which means we can make good sense of the quoted passage.

Similarly, in the passage about conjunction quoted just above, "*p*", "*q*", and "*C*", as well as "*p C q*" can all be interpreted as italicized concept-designators, which would all be well-formed singular terms.[5] With the added stipulation that one can quantify (with first-order objectual quantifiers) into any position of an italicized concept designator, as in "For some *c*, John expressed the concept *white c*", one could make better sense of Peacocke's formulations. However, I argue in Section 5 that italicized concept-designators come with many important drawbacks, so the availability of this interpretation does not in the end conflict with the claim that my solution to these problems is preferable.

3. How the functor notation avoids the problems

The notation proposed for referring to complex concepts involves functors saturated by singular terms referring to concepts. Thus, on the assumption that the proposition that Socrates is wise involves only two simple concepts, WISE and SOCRATES, we can use "f_1(WISE, SOCRATES)" to refer to it. As a preliminary, let us say that the functor "f_1" is then defined as follows:

(DF) $f_1(x, y)$ = the simple subject-predicate proposition whose monadic, predicative concept is x and whose "subject" concept is the individual concept y.

Similarly, we can introduce the triadic functor, "f_2", which designates a function taking *dyadic* predicative concepts and two individual concepts to propositions, and finally the functors "c_1" and "c_2", used to designate propositions involving propositional operators (monadic and dyadic, respectively). Let us use "<*p*>" to abbreviate, "the proposition that *p*". We will then have the following identities:

(I1) <Socrates is wise> = f_1(WISE, SOCRATES).

(I2) <John loves Mary> = f_2(LOVE, JOHN, MARY).

(I3) <Socrates is not wise> = c_1(NOT, f_1(WISE, SOCRATES)).

(I here ignore tense and mood, of course, but see the end of Section 4 below.) With this notation, plus the simple assumptions about the syntax of certain propositions, we can state possession conditions of concepts in a straightforward way. These statements arguably come close to what Peacocke originally intended:

(AA′) ARISTOTLE is the unique concept *c* such that, necessarily, a person *P* possesses *c* iff *P* believes f_2(=, *c*, *the teacher of Alexander*).

(AR′) RUN is the unique concept *c* such that, necessarily, a person *P* possesses *c* iff, for every individual concept *c′*, *P* believes $f_1(c, c')$ iff *P* believes f_1(*walks quickly*, *c′*).

For convenience, I here use italicized expressions to refer to complex concepts. (AA′) and (AR′) are clearly unacceptable for several reasons, not least the crude descriptivism involved in (AA′). But the point is that (AA′) and (AR′) steer clear of the “formal/syntactic” problems noted above. The reason is that this notation opens up referentially transparent slots for singular terms in the complex terms referring to complex concepts (like propositions), into which we can quantify over concepts with first-order, objectual quantifiers.

The functor notation also allows a straightforward way of making explicit what it is to (be disposed to) infer in accordance with a general inference rule. Instead of Peacocke’s problematic statement, we can say,

AND is the unique concept *c* such that $\forall x$(*x* possesses *c* iff $\forall pq$(if *p* and *q* are propositions, then:

x is disposed (in circumstances *C*) to believe $c_2(c, p, q)$ upon believing *p* and *q* and
x is disposed (in circumstances *C′*) to believe *p* upon believing $c_2(c, p, q)$ and
x is disposed (in circumstances *C″*) to believe *q* upon believing $c_2(c, p, q)$)),

where "p" and "q" are first-order variables. These conditions differ somewhat in substance from Peacocke's, but the relevant point is that they avoid the problems with his formulation discussed in the foregoing section. (I argue in (Båve 2019a) that the above possession conditions are in fact better than Peacocke's, which, if read literally, over-intellectualize in requiring that one have attitudes about "transitions". In that paper, as in (Båve 2019b), I make us of precisely the kind of functors advocated here.)

We can also give a better requirement of non-circularity than Peacocke's. His requirement is that "if $\mathcal{A}(C)$ is the possession condition for the concept F, then F must not be mentioned *as F* within the scope of the thinker's propositional attitudes within the condition $\mathcal{A}(C)$" (1992, p. 35). While we can see roughly what is intended here, our new notation allows us to say instead that the concept-designator of a concept c (e.g., "ARISTOTLE") may not occur in the right-hand side of a sentence expressing the individuation (in terms of possession conditions) of c. This is clearer, simpler, and more obvious than Peacocke's formulation.

The benefits of this notation have to do with the logical form of its concept-designators. "That"-clauses work very differently. In particular, the constituents of "that"-clauses are not in general singular terms referring to concepts (and, *pace* Schiffer 2003, p. 30, adherents of structured propositions are not forced to think otherwise). One cannot, therefore, quantify into all positions in "that"-clauses using first-order variables, and quantifying into "that"-clauses does not have the effect of quantifying over concepts (except perhaps in the special case in which a "that"-clause contains a term referring to a concept).

How, then, should we view the relationships between the referents of "that"-clauses and those of its parts, and between those referents and the concepts expressed by the expressions in question? For present purposes, we can remain neutral on this matter. In my view, the most obvious and plausible view is that (i) what "that"-clauses refer to is a function of which concepts are *expressed* by their constituent expressions (rather than a function of their *referents*), and (ii) expressions in a "that"-clause always retain their usual referents and senses (*contra* Frege, who thought they sometimes refer to their customary senses and to have higher-order senses).

Assuming (i) and (ii), "that"-clauses differ from our functor-designators of propositions in that the referent of the latter is a function of the *referents* of its parts (ultimately, the simple, small-caps concept-designators), rather than a function of what concepts its parts *express*. However we view the semantic functioning of "that"-clauses, it is clear that they differ from our functor designators of propositions in that we cannot in general quantify into "that"-clauses with the effect of quantifying over concepts, whereas with the functor designators, we can. The functor notation thus provides a simple way in which to give an extensional semantics in spite of making serious use of propositions.

None of the above is to say that we should somehow do away with "that"-clauses. Doing so would be unmotivated and self-defeating. Hypotheses about the structure of propositions will be stated using such identity claims as, "that Socrates is wise = f_1(SOCRATES, WISE)". Such identity claims are indispensable to any given hypothesis of propositional structure, and they clearly cannot be stated without "that"-clauses. We might say that "that"-clauses are in an important epistemic respect more basic than functor designators.

4. Further characterization of the functor notation

I know of no clear antecedent to the present proposal (although a brief passage in Davis 2003, pp. 235f. comes close). Some major works on structured propositions use proposition designators that are rather like "that"-clauses. To wit, these designators do not contain singular terms of each propositional constituent of the relevant proposition (see, e.g., Bealer 1982 and Zalta 1988). In other works on structured propositions, the proposed proposition designators do contain designators of propositional constituents (e.g., King 2007, Soames 2010, 2015, and Hanks 2011, 2015, Båve 2017, Section VI). However, these more particular notations are bound up with substantial views about propositions, and thus lack the neutrality/variability of the functor notation and its expressive benefits. A further, common way of referring to structured propositions is by way of (nested) *brackets*, which are either taken as uninterpreted or interpreted set-theoretically. I discuss and compare my notation with this notation in Section 5. It is important to distinguish the present view with the many systems inspired by Frege on which senses of predicates are themselves functions from the senses of names to propositions, as in Church 1951. I compare and contrast my view with such views below.

Merely using a functor (together with saturating singular terms) to refer to a complex concept of course does not explain what that concept is, and how it relates to its constituent concepts. That question is answered by a definition of the functor, of the form,

(D) $f(x_1, \ldots, x_n)$ = the object y such that $F(x_1, \ldots, x_n, y)$.

The definition (DF) above is an example, but it is reasonable to think there must be a more informative definition, and, hence, by implication, a more informative account of propositions as such, and of how they relate to their constituents. A more informative account might be, for instance, some Fregean version of the Act-Type Theory, on which "f_1" might be defined along the lines of:

(ATT) $f_1(x, y)$ = the act (type) of conjoining/saturating/etc. x with y.[6]

But this substantial question of the nature of composition can be set aside in discussions about other aspects of structured propositions simply by leaving open how the functors should be defined.

Obviously, using functors of this kind means positing *functions*, which will take concepts to more complex concepts. The question what these functions are like is really the same as the question how the functors are to be defined (or, rather, if there is a further question about what functions are like, it will be a question of the general metaphysics of functions, which need not concern us here). Still, speaking of the functions designated by the functors is not idle. Indeed, the benefit of expressive power comes precisely with *quantifying over* those functions. Let us say that the functions designated by the functors defined in the best/true theory of concepts are *syntactic functions*. So, if the act type theory is the best/true theory of concepts and propositions, then among the syntactic functions will be functions defined by something like (ATT).

Note first that there is one respect in which positing syntactic functions is *not* of any use: if we knew how to define the syntactic functions we need to posit, then we could refer to complex concepts without mentioning functions at all. For then, we could simply use the expressions occurring in the *definientia* of the relevant functors, for instance, "the act type of conjoining …". However, the fact that we can say certain things about concepts even if we don't know how syntactic functions should be defined, by quantifying over syntactic functions, illustrates a respect in which the latter is useful.

Here is an analogy with the oft-recognized benefit of the concept of truth. We would not have to use the concept of truth to endorse what John said if we knew what he said, since we could then just repeat it. But "true" has an important expressive function precisely because with it, we could endorse what John said even not knowing what he said, by saying that what he said is true. Similarly, it is in itself a benefit of positing syntactic functions that we can make various claims about complex concepts although we do not know how those functions are to be defined. By the same token, we can make claims about complex concepts without commitment to any controversial view about the nature of composition.

As an illustration of this benefit, let us see how we might give a neutral definition of *involvement*. Defining involvement is difficult in view of the fact that a concept can be involved in another at different syntactic depths. On a mereological view of conceptual composition, this is not a problem, since, on this view, a concept that involves another *contains* the other, and parthood is transitive. But this view is of course not neutral, since it is committed to complex concepts literally containing its constituents as parts (for recent discussions of this view, see Davis 2003, Chapter 14 and Heck and May 2011, Section 4). But if we quantify over syntactic functions, we can give a neutral definition of involvement, by taking it as an ancestral relation, defined recursively:

(Base) *x* is immediately involved in *y* iff$_{\text{def}}$ for some syntactic function *z* and some concepts *xx*, *y* is the value of *z* for *xx* as arguments (in whatever order) and *x* is among *xx*.

(Recurs.) *x* is involved in *y* iff$_{\text{def}}$ *x* is immediately involved in *y* or there is some concept *z* such that *z* is immediately involved in *y* and *x* is involved in *z*.

This definition is neutral because of its appeal to syntactic functions in its base clause, the natures of which are not specified. The quantifier "*z*" in the *definiens* of (Base) is first-order, that is, it occupies name-position and not functor position. With the help of (CP) of Section 1, however, we can use this definition to determine, for any two concepts designated by our functor-notation concept-designators, whether one is involved in the other.

Let us now see some other important ways in which the functor notation is neutral. Clearly, it is neutral as to the nature of simple concepts (referred to by small-caps concept-designators), for instance, on whether they are mental or not, types or some other type of abstract object, etc. It is also neutral as to the semantic functioning of designators of simple concepts: the functor notation can be accepted and applied regardless of one's theory of how simple concepts are designated. Further, it is neutral about the nature of composition (e.g., on whether complex concepts literally contain its constituent concepts as parts), since this is just the question about how the functors are to be defined.

The functor notation also takes no stand on whether some concepts are *functions*. Consider, by contrast, a "Fregean" view, on which

(I1′) <Socrates is wise> = the value of *wise* at SOCRATES,

(I3′) <Socrates is not wise> = the value of *not* at (the value of *wise* at SOCRATES),

where *wise* and *not* are functions. (Although Frege did not clearly subscribe to this view, many interpreters have, and several logical systems inspired by Frege incorporate this assumption, e.g., that of Church 1951.) Whatever the pros or cons of this view, it can trivially be appropriated in our notation, simply by defining, for instance, $f_1(x, y)$ as the proposition which is the value of the predicative concept x (which, *ex hypothesi*, is a function), for y as argument, and similarly for other functors. The present view is completely different from these "Fregean" views, however. They take the senses of predicates to be functions from senses to senses, and my "syntactic functions", too, are such functions, but the latter are not the senses of (or concepts expressed by) any kind of expression.

Another question under the heading, "the nature of composition", is how many modes of composition there are, which we can identify with the question how many syntactic functions one needs to posit. For simplicity, we have been operating with the functions, $[f_1(\xi, \zeta)]$, $[f_2(\xi, \zeta, \chi)]$, $[c_1(\xi, \zeta)]$, $[c_2(\xi, \zeta, \chi)]$, and so on, but it will be illustrative to consider some alternative "inventories" of syntactic functions. One option is to assume that there are only the functions $[f_1(\xi, \zeta)]$ and $[f_2(\xi, \zeta, \chi)]$ and to say that these take not only predicative concepts and individual concepts but also propositional-operator concepts and propositions, so that, for instance, <*p* and *q*> = f_2(AND, <*p*>, <*q*>). A very different inventory of syntactic functions would contain only the functions $[s^1(\xi, \zeta)]$, $[s^2(\xi, \zeta)]$, …, where

(DS1) $s^1(x, y) =_{\text{def}}$ the concept had by saturating x in its *first* argument-place,

and so on (cf. Zalta 1988). These functions, too, could be assumed to have both predicative concepts and propositional-operator concepts as first argument. A third option is to posit only a single syntactic function $[g(\xi, \zeta)]$, and identify propositions involving polyadic predicative and propositional-operator concepts with the results of iterating this one function, so that <*Fa*> = *g*(F, A), <*Rab*> = *g*(*g*(R, A), B) and <*p* and *q*> = *g*(*g*(AND, <*p*>), <*q*>), and so on. In Båve 2017, Section VI, I instead posit a single, multi-grade function $[d(\xi, \zeta_1, \ldots, \zeta_n)]$ whose first argument-place is reserved for predicative, propositional-operator, and other incomplete concepts and the others for concepts suitable for saturating them, so that <*Fa*> = *d*(F, A), <*Rab*> = *d*(R, A, B), <*p* and *q*> = *d*(AND, <*p*>, <*q*>), and so on. Which of these to adopt (if any) is a major question for any theory of structured, Fregean propositions.

A further question on which the functor is neutral is which syntactic categories of concepts there are. Should we say that there are only the syntactic categories of first-order logic, or should we say that there are (also?) concepts of such categories as *noun*, *noun-phrase*, etc.? There is also a question whether positing more syntactic categories of concepts also requires positing more syntactic functions. The answer is not obvious. Perhaps some general (multigrade) notion of conjoining can be appealed to in designating propositions involving concepts of these different varieties.

Finally, the functor notation is neutral with regard to competing types of semantics. It is neutral both about how concepts should be individuated, and about the right form of a compositional semantics for linguistic expressions. Beginning with semantics in the first sense, we can note that the discussion of Peacocke's theory resulted in an improved version of Conceptual Role Semantics, which individuates concepts by their possession conditions, which in turn are to the effect that the concept play a certain conceptual (inferential, functional, causal, etc.) role.

It is also easy to see how different kinds of truth-theoretic semantics for concepts could be formulated. Basically, one can take any truth-theoretic semantics, and take it to be about concepts rather than expressions. For instance, we could have an axiom saying that, for every x, y, the proposition $f_1(x, y)$ is true just in case the referent of y is in the extension of x.

The functor notation is thus open to both of these kinds of semantics. Note, however, that concepts would not be *identified* with conceptual roles or with truth-theoretic semantic values. Rather, concepts *have* them, and thus play a role similar to that of linguistic expressions in standard semantic theories. This idea of course resembles the language-of-thought hypothesis. Note, though, that this hypothesis is typically silent on how the relevant items are composed. Although they are called "expressions", is not clear that they, like real expressions, are juxtaposed or temporally ordered in any intelligible sense.

What about semantics, considered as a theory of how the meanings of linguistic expressions compose? Our discussion of this issue must of necessity be rather brief, but it is worth pointing out how easy the functor notation makes it to give a (neo-) Gricean compositional semantics (see, e.g., Davis 2003, Section 10.3). To wit, the semantic axioms on such a theory could be on the lines of, (A1) "runs" means RUN,

(A2) "John" means JOHN,

(A3) "NP VP" means f_1(what VP means, what NP means),

(A4) "and" means AND,

(A5) "p C_2 q" means c_2(what "C_2" means, what "p" means, what "q" means).

From these axioms, we can easily infer,

"John runs and John runs" means c_2(AND, f_1(RUN, JOHN), f_1(RUN, JOHN)).

Now, we can also see how to treat cases in which surface structure and logical form can come apart. For instance, we could take *tensed verbs* to express both a propositional-operator "temporal concept", corresponding to its tense-inflection, and an ordinary predicative concept, on the lines of the semantic axiom,

(A6) If T is the temporal concept associated with the tense of VP, x is the predicative concept expressed by VP, and y is the concept expressed by NP, then "NP VP" means c_1(T, $f_1(x, y)$).

Obviously, the question of how to develop a (neo-) Gricean semantics is vast, and I must leave it here. The main point of this digression is to show how much easier this task becomes if we use functors, rather than "that"-clauses, to refer to propositions. This point generalizes to all inquiries we may have about propositions and their constituents, for instance, inquiries about propositional attitude reports, and the role of names and descriptions within the scope of attitude verbs, although that, too, goes beyond the scope of the present paper. This all comes down to the lessons of Sections 2-3, where we saw how the functor notation allows simple and unequivocal generalizations over concepts involved in proposition of various forms.

Finally, although the functor notation is neutral in all the ways illustrated above, we should note that any specific notation using these functors must, on the contrary, prejudge both questions of syntactic functions and of syntactic categories. The claims (I1)-(I3), for instance, are contentious, since <Socrates is wise> might also be analysed as containing an "adjectival concept" and a "copula concept" (just to mention one alternative). But this contentiousness of particular notations using functors is clearly unavoidable.

5. Two other kinds of concept designator

This section deals with "italicized concept-designators", mentioned above, and with a rather common kind of "set-theoretic" notation for designating propositions. Examples of the former include, for instance, "*white horse*", which is a singular term formed from two singular terms, "*white*" and "*horse*", by mere juxtaposition. Davis 2003 uses such expressions as his standard designators of concepts. I have no general objection against doing so, especially since these are plausibly well-formed expressions of ordinary English. Nevertheless, they share with "that"-clauses the disadvantage (for certain theoretical purposes) that one cannot quantify into them with the effect of quantifying over concepts. In ordinary English, one cannot say, "For some concept *c*, John entertains the concept *white c*". One could of course just stipulate that the positions within italicized concept designators be open to quantification, but then the question arises whether this technical notation should be preferable to the more conspicuous functor notation.

Another disadvantage of italicized concept-designators is that they prejudge certain important questions about the relationships between conceptual syntax and linguistic syntax. Further, the lack of visible structure in these concept designators obfuscates these presuppositions. Particular functor-notations suffer from the related disadvantage that they prejudge questions of syntactic structure. But these presuppositions will be visible and explicit. Thereby, it also allows various kinds of weakening (hence, more neutral formulations), for instance, by existential quantification over syntactic functions. The presuppositions will also not be mandated by the functor notation, since the latter is compatible with any hypothesis as to the simplicity or complexity of a given concept. Thus, while any notation capable of referring to concepts must make such presuppositions, the functor notation itself does not.

An important question about italicized concept-designators is, which ones are well formed? Suppose we decide that *any* phrase in a well-formed sentence can be italicized to form a felicitous singular term referring to "the concept it expresses". The reader can easily see that this would commit us to a contentious syntax of concepts, one which would entail that there is a concept expressed by "and John", since this is a phrase of some well-formed sentences. But no terminology should be that contentious.

A less contentious notation could be had by adopting the more restricted convention that only phrases that express concepts. One could then hypothesize that "*the President of France*" would come out as a felicitous concept-designator, but "*and John*" will not. The obvious problem with this convention is that we cannot yet identify the legitimate concept-designators. Doing so is a vast theoretical enterprise, which itself requires a clear and uncontentious way of referring to concepts. Further, even if we knew how to identify the legitimate italicized concept-designators, we would still have no designator for concepts not expressed by any substring of a well-formed sentence. And it should not be presupposed that there are no such concepts (cf. (A6) above).

Italicized concept-designators suggest a kind of isomorphy between the structure of concept-designators and that of the concepts they designate. But some simple words might express two concepts, which do not form any complex concept. Tensed verbs are a case in point (cf. again (A6) above).

Conversely, there may be complex expressions expressing a single concept, candidates of which might include idioms, the preposition, "in front of", and many more. Even if there are no such cases, our terminology should not prejudge the matter, even by mere "suggestion". There might be ways of complicating this mode of concept designation so as to avoid these problems, but the resulting notation would arguably be something of a patchwork, whereas the functor notation instead gets things right from the start. Italicized concept-designators are meaningful and thereby interesting in their own right, not least as objects of study in natural language semantics. However, they have several features that make them ill-suited as concept-designators in a theory of concepts.

Let us turn now to "set-theoretic concept designators". It is fairly standard to use brackets to indicate the branching structure of concepts. An example might be "<NOT, <LOVE, <SOCRATES, PLATO>>>", used to designate (or model) the proposition that Socrates does not love Plato (see Lewis 1970, Cresswell 1985, Schiffer 2003, p. 15, Vignolo 2006, Pautz 2008, Chalmers 2011, p. 601). Since these concept-designators consist of simple concept designators and "linking" expressions, they have many of the advantages that our functor notation has over "that"-clauses and italicized concept designators.[7]

Set-theoretic designators are typically seen not as proper concept designators but as "models" of concepts, or as referring to "representations" of concepts. The reason is that concepts would otherwise have to be taken as sets. This is an implausible view of concepts, subject to Benacerraf worries (see Lewis 1970, p. 32 and Moore 1999) and other problems noted by Soames 2015, Chapter 1.

But there are also problems with the bracket notation, even if taken merely as "modelling" concepts. Firstly, it is simply not clear what "modelling" means. This notion can presumably be defined in various ways, but there may be controversies about which is best, which means that the notation comes with some serious uncertainties about how it is supposed to work. Further, it is reasonable to expect that given a definition of modelling, there will be a more straightforward notation, which bears its relationships with actual concepts on its sleeves, rather than requiring a notion of modelling as intermediary.

Secondly, as it stands, the set-theoretic notation does not make room for the possibility that complex concepts of different syntactic categories are "put together" in different ways. The functor notation accommodates this possibility simply by allowing several functors, one for each mode of combination. One could of course introduce further types of brackets, and think of them as serving the same purpose. It may seem that we would thereby have a mere notational variant of the functor notation. But as we have seen, the functor notation allows us to quantify over syntactic functions to achieve greater expressive power, and it is hard to see how that would be achieved with the multiple-bracket notation.

Perhaps one could somehow expand on the bracket notation so as to obtain a notation with equal expressive power, but this goes far beyond what has so far been proposed by philosophers using the bracket notation. The upshot, then, is that without several substantial additions, the bracket notation will be inferior to the functor notation even if it is merely taken to "model" propositions (however exactly modelling is to be understood).

Stockholm University

Acknowledgements: thanks to the audiences at the *Institutskolloquium*, Hamburg University, the Theoretical Reasoning Seminar, Kent University, and the Higher Seminar, Uppsala University, for valuable comments.

[1] There are several direct-reference, non-descriptivist and externalist theories that operate with Fregean propositions, for instance, Evans (1982), Peacocke (1992), Hanks (2011), and Recanati (2012).

[2] It may be objected that WISE is not a plausible candidate for a *simple* concept. In my view, we must distinguish between syntactic and semantic complexity. The concept *brother* is syntactically simple but semantically complex, in that it can be defined by other concepts, which are more basic. Some may object to this that semantic complexity reduces to syntactic complexity in that, for instance, the concept *brother* is the same as the syntactically complex concept *male sibling*. But this falls afoul of standard Fregean constraints: one can doubt that all and only brothers are male siblings, perhaps for philosophical reasons pertaining to the

"traditional conception of concepts", without doubting that all and only brothers are brothers. Fortunately, nothing of what I will have to say depends on this distinction, so unconvinced readers may replace WISE with a concept they take to be simple.

[3] See Båve 2009 for a more detailed analysis of "about", as designating a relation between propositions and objects, and its relationships with the notions of reference and denotation.

[4] If we use substitutional quantifiers instead, we could use the same type of quantifier regardless of the syntactic position of the variable, but the goal here is, again, to provide a way of quantifying with *objectual* quantifiers over concepts. This is clearly preferable over substitutional quantification, given the well-known problems with the latter (van Inwagen 1981 even argues that it is strictly unintelligible).

[5] If this works with italics, why not for "that"-clauses? Well, we want the instances of "*p C q*" to come out as well-formed singular terms or sentences, but if "*p*" and "*q*" are instantiated by "that"-clauses, we get at most instances like "that snow is white and that grass is green". While this is well-formed, "and" is not strictly a sentential connective, and the whole is neither a singular term, nor a sentence, but a kind of complex noun phrase.

[6] Examples of Russellian versions of the Act-Type Theory, see Soames (2010, 2015) and Hanks (2011, 2015), and, for Fregean versions, see Davis 2003, Chapter 12 and Båve 2016, Section VI. On my own view, concepts are the same kind of entity as propositions, namely, mental event-types.

[7] One could identify further kinds of complex concept designators in the literature sharing this trait. Yalcin (2015: 216, n. 14) uses the symbol "$\oplus$" for what he calls "sense-glue", which is placed between sense-designators to form complex sense-designators designating complex senses. Perhaps incidentally, this is the sign used by Leibniz to denote "concept addition", but his notion is quite different from what we are discussing here.

References

Båve, Arvid. 2019a. "Semantic Dispositionalism without Exceptions", forthcoming in <u>Philosophical Studies</u> in 2019.

—— 2019b. "Acts And Alternative Analyses", <u>Journal of Philosophy</u>, vol. 116, pp. 181-205.

—— 2017. "Self-Consciousness and Reductive Functionalism", <u>Philosophical Quarterly</u>, vol. 67, pp. 1–21.

—— 2009. "A Deflationary Theory of Reference", <u>Synthèse</u>, vol. 169, pp. 51–73.

Bealer, George. 1982. <u>Quality and Concept</u> (Oxford: Clarendon Press).

Chalmers, David. 2011. "Propositions and Attitude Ascriptions: A Fregean Account", Noûs, vol. 45, pp. 595–639.

Church, Alonzo. 1951. "A Formulation of the Logic of Sense and Denotation", in Structure, Method and Meaning, ed. Paul Henle (New York: The Liberal Arts Press), pp. 3–24.

Cresswell, Max J. 1985. Structured Meanings (Cambridge, MA: MIT Press).

Davis, Wayne. 2003. Meaning, Expression, and Thought (Cambridge: Cambridge University Press).

Hanks, Peter. 2011. "Structured Propositions as Types", Mind, vol. 120, pp. 11–52.

—— 2015. Propositional Content (Oxford: Oxford University Press).

Heck, Richard, and Robert May. 2011. "The Composition of Thoughts", Noûs, vol. 45, pp. 126–166.

King, Jeffrey. 2007. The Nature and Structure of Content (Oxford: Oxford University Press).

Lewis, David. 1970. "General Semantics", Synthese, vol. 22, pp. 18–67.

Moore, Joseph G. 1999. "Propositions, Numbers and the Problem of Arbitrary Identification", Synthese, vol. 120, pp. 229–263.

Pautz, Adam. 2008. "An Argument against Fregean That-Clause Semantics", Philosophical Studies, vol. 138, pp. 335–347.

Peacocke, Christopher. 1992. A Study of Concepts (Cambridge, MA: MIT Press).

Recanati, François. 2012. Mental Files (Oxford: Oxford University Press).

Schiffer, Stephen. 2003. *The Things We Mean* (Oxford: Oxford University Press).

Soames, Scott. 2010. What is Meaning? (Princeton, NJ: Princeton University Press).

—— (2015), Rethinking Language, Mind, and Meaning (Princeton, NJ: Princeton University Press).

van Inwagen, Peter. 1981. "Why I Don't Understand Substitutional Quantification", Philosophical Studies, vol. 39, pp. 281–285.

Vignolo, Massimiliano. 2006. "A Defence of Fregean Propositions", Disputatio, vol. 2, pp. 39–64.

Yalcin, Seth. 2015. "Quantifying in from a Fregean Perspective", Philosophical Review, vol. 124, pp. 207–253.

Zalta, Edward. 1988. Intensional Logic and the Metaphysics of Intentionality (Cambridge, MA: MIT Press).