The Modal Argument against Nominal Description Theory

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Abstract
The paper examines Loar’s and Bach’s defence of Nominal Description Theory against Kripkean Modal Argument (MA). Using formal tools of hyperintensional logic, I discriminate three kinds of nominal description which are possible substitutes for a proper name, thus considering various readings of the MA. On its natural understanding, the MA is valid – contrary to what Loar and Bach say. On the other hand, the soundness of the MA remains doubtful, as pointed out already by Loar and Bach.

Keywords: nominal description theory, modal argument, millianism

1 Introduction

The paper examines Loar’s [16] and Bach’s [4, 3] defence of Nominal Description Theory (NDT) against Kripkean Modal Argument (MA) (cf. [14]). They maintained that the MA is not valid because, if unmodified NDT is employed, the scopes of a proper name utilized in the MA are mismatched. (These topics are covered by Sections 2–3.)

Their reservations are serious and require careful treatment by means of a formal apparatus. Due to the richness of its distinctions and ability to depict scopes I use a suitable hyperintensional logic, namely Tichý’s [32] Transparent Intensional Logic (see Section 4). After restating rigidity within this framework, we find there are three kinds of nominal description (rigid, pseudo-rigid and non-rigid) and thus three corresponding versions of a proper name. Since each of these names occur in the MA in both wide and narrow scope, we obtain a total of six versions of the MA in which the scopes are not mismatched. All these versions are valid because they are instances of modus tollens, which is a valid
scheme. It would be artificial to mismatch scopes to yield invalid versions of the MA. (These topics are covered by Sections 5–6.1.)

On the other hand, the examination of the soundness of valid instances of the MA shows that it depends on the irreconcilable assumptions of disputers. By itself, then, the MA cannot disprove NDT. Kripke [14] took names to be rigid because language is understood as being fixed. Bach and Loar, however, assumed that language evolves; names and nominal descriptions are not rigid. Further discrepancy is generated by the fact that Loar’s and Bach’s version of the MA utilizes a negation at a different position than in Kripke’s MA. (These topics are covered by Sections 6.2–7.)

2 Modal Argument against Descriptivism

As is well known, Millianism and Direct Reference Theory, which have been so popular since the 1970s (cf. esp. [14], [28], [30]), are modern forms of the naïve semantics of proper names – as we may call it – according to which the meaning of a proper name $N$ is nothing but an individual $N$ to which $N$ refers. One may easily come to support this naïve theory: it provides a useful and often adequate model of the semantic features of proper names.

However, the naïve semantics has serious problems with names without reference, e.g. empty names or names in fiction, because sentences containing them seem to be meaningful and even true/false, and so, by the Principle of Compositionality of Meaning, such names should have a semantic content.

Because of such problems, theoreticians are seeking an alternative semantic theory, the most often discussed being Description Theories of Proper Names. They involve Descriptivism – the semantic doctrine according to which the meaning of a proper name $N$ is the meaning of a certain definite description $D$ or a cluster of descriptions. For example, the proper name “Aristotle” means the same as, and is thus only a short cut for, the description “the teacher of Alexander the Great”. The original version of this theory seems to have been propounded by Frege [9] and Russell (in a number of writings, incl. [27]).

The lack of a referent of $N$, which results in $N$’s lack of meaning, is thus solved by the stipulation that $N$’s meaning is the meaning of particular description $D$. $N$’s lack of a reference is then accommodated as a lack of reference of $D$. The fact that $D$ does not pick out a definite object (which happens when no single object fits the property which is
usually explicitly mentioned in $D$) is unproblematic because $D$ does not cease to have a meaning even if it has no referent.

However, Kripke [14] argued quite convincingly that the solution of problems which is provided by Descriptivism comes with a big price tag: the meanings yielded by descriptions give proper names too much semantic content – unlike proper names, descriptions are loaded with semantic content because they, or their parts, are genuine lexical items.

This becomes evident from, e.g. the following well-known reasoning suggested by Searle as early as in [29] and emphasised by Kripke [14]. If the proper name “Aristotle” means the same as the description “the teacher of Alexander the Great”, and so they are intersubstitutable, the sentences “Aristotle was a teacher.” and “The teacher of Alexander the Great was a teacher.” mean the same. However, the two sentences differ in meaning because they each have a distinct modal profile: the latter is analytic, while the former is not (Aristotle might not have gone into pedagogy).

Kripke further argued that $N$ and $D$ differ in the nature of their reference, and not only in that $N$ picks out an individual directly, while $D$ does not. Each $N$ refers to an individual rigidly, i.e. $N$ refers to one and the same individual $N$ in all possible worlds. On the other hand, an ordinary description $D$ refers to one individual in one world and to another individual in another world – ordinary descriptions are thus non-rigid.

Kripke [14] used the notion of rigidity in his most famous argument against Descriptive Theories, the Modal Argument (the MA). Various versions of the argument have been published, e.g. Loar [15], Soames [31], Salmon [28]. The following version greatly follows Kripke’s dicta.

Modal Argument (the MA)

If a proper name $N$ has the same meaning as a description $D$, it is not a rigid designator.$^6$
A proper name $N$ is a rigid designator.$^7$
\[\therefore\] A proper name $N$ does not have the same meaning as a description $D$.

3 Nominal Description Theory (NDT)

Description Theories of Proper Names have been defended by various authors via the employment of widescopism or rigidified descriptions.$^8$ Neither of these approaches nor criticism of them are investigated here.
As the title of the present paper suggests, I am rather focusing on an examination of the famous special version of Description Theory, viz. Nominal Description Theory (NDT) (Bach’s label), which is also known as Pure Metalinguistic Theory (Katz’s label). According to one of its versions, the meaning of a proper name \( N \) is identical to the meaning of the corresponding nominal description, i.e. “the bearer of \( N \)” (other forms being: “the only individual named \( N \)”, “the thing which is a bearer of \( N \)”).

The first NDT was proposed by Russell [27]. It was reintroduced and elaborated by Kneale [13]; Kneale’s version was criticized by Kripke [14]. Loar [16] proposed a version of NDT according to which the proper name \( N \) contributes to the semantic content of an asserted sentence via the property ‘REFERRED TO AS, OR HAS BEEN DUBBED, \( N \)’.

Bach presented and defended NDT several times [4, 3, 1] and maintained that the proper name \( N \) is semantically equivalent to the nominal description “the bearer of \( N \)”. Bach rejected the sameness of meaning of \( N \) and “the bearer of \( N \)” because he did not consider, e.g. “John” to mean in English ‘the bearer of “John” ’. According to Bach, names are not lexical items, and so do not belong to English as such. As will become apparent below, we may accept Bach’s weakened version of NDT, yet our considerations concerning the MA with regard to NDT will not change.

Katz [12] proposed an NDT according to which ‘the thing which is a bearer of \( N \)” is the sense of a name. Geurts [10] accepted an NDT version according to which a proper name \( N \) is synonymous with (i.e. has the same meaning as) “the individual named \( N \)”.

NDT versions exist which differ from those just mentioned in several respects including one by Recanati [26] – the concept of the bearer of \( N \) constitutes the Kaplanian character of \( N \) – and one by Justice [11] – a name \( N \) is a name only if it sticks to its bearer; it is not clear, however, whether the naming relation is a part of the internal semantic content of a name.

Recently, Fara [8] proposed a version of Predicativism (or: the Predicate view) concerning proper names according to which the semantic value of name \( N \) (when it occurs as a predicate, cf. [8] for more details) is the condition (property) \( \{ x : x \text{ is called } N \} \). She does not discuss NDT, nor the MA which is raised against it. Bach [2] considers the NDTs by Bach, Geurts and Katz to be an anticipation of predicativism.

In this paper, I employ Bach’s version of NDT. For the goal of our investigations it does not seem necessary to avoid Kripke’s notion of ref-
erence as many NDTians do. Another problematic feature of the Kripkean approach, the doubtful solution of the polysemy of proper names, is suppressed in this paper.

3.1 A Defence of NDT against the MA

Loar [16] started the defence of NDT against the MA, which was accepted and further developed by Bach [4, 3].

They could use an instance of the above formulation of the MA which would employ “nominal description” instead of mere “description”. But Loar [16, p.373] and then Bach [4, p.374], [3, p.150] used some obvious substitution in the MA, viz.

“‘N might not have been the F’ is false/true” for “N is/is not a rigid designator”.

Following Bach [3, pp.150–1], I substitute also

“the bearer of N” for Loar’s original “the F”.

There is, however, a striking difference between this MA – further referred to as the MA$^{NDT}$ – and the MA presented in Section 2 above. The MA and the MA$^{NDT}$ differ in the fact that the consequent of the MA$^{NDT}$’s first premise contains two negations, not one as in the case of the MA, and that the MA$^{NDT}$’s second premise contains one negation, not zero as the MA’s does. We will return to this issue in Section 6.2.

The MA against NDT (the MA$^{NDT}$)

(a) If $N$ means the same as “the bearer of $N$”, then ‘$N$ might not have been the bearer of $N$’ is false.

(b) ‘$N$ might not have been the bearer of $N$’ is true.

(c) $\therefore$ $N$ does not mean the same as “the bearer of $N$”.

The argument evidently takes form of modus tollens. It is therefore valid. It is thus surprising that both Loar and Bach found the argument invalid:
The argument is defective. Names are normally read as having wider scope than modal operators – and that is why (b) is true for the relevant F’s [i.e. a bearer of N]. . . . But if the N-position in the sentence mentioned in the premise (a) is read similarly as having the widest scope, then premise (a) is clearly false, as my be seen by substituting ‘the F’ [i.e. “the bearer of N”] for N.

[16, p.373]

This pattern of argument is formally valid, at least if the occurrences of singular terms have consistently wide or narrow scope from line to line. However, as Loar (1976:373) objected, the argument trades on an illegitimate shift of scope

Loar suggested that the argument trades on an illicit shift of scope

[3, p.150]

Before exploring Loar’s and Bach’s views, it would be convenient to review the definitions of scopes adopted from Bach [3, p.145]:

- a singular term \( ST \) takes **wide scope** in a sentence \( S \) iff, when evaluating \( S \), we first fix the referent of \( ST \) and then consider a counterfactual situation

- a singular term \( ST \) takes **narrow scope** in a sentence \( S \) iff, when evaluating \( S \), we first consider a counterfactual situation and then determine \( ST \)’s reference with respect to this situation.

Loar [16, p.373] claimed that names have naturally **wide scope** in the MA\(^{NDT}\), which is in fact **unsound** (this is a natural way of interpreting Loar’s term “defective”):

- \( N \) takes wide scope in (b) and the consequent of (a)
- (b) is true because \( N \) might not be the bearer of \( N \)
- (a) is false because its consequent is false (Loar assumed NDT is true)
- consequently, (c) is false.

Bach [4, pp. 374–5], [3, p.150] confirmed Loar’s findings and also examined [3, pp.150–1] the **narrow scope** reading of the argument, which is also **unsound**:  

- the antecedent of (a) is true\(^{13} \) (otherwise, we beg the question)
- (a) is only true on the narrow scope reading of its consequent
– then, (b) is false
– consequently, (c) is false.

To evaluate their claims, we need to detect the alleged mismatch of scopes for which an adequate formal notation must be used. We will use a convenient logical apparatus introduced in the next section. After this, we will be able to discover several interpretations of the MA\textsuperscript{NDT} and discuss its soundness conclusively.

4 Formal semantics

In this section, we describe the basic ideas and formalism of Tichý’s Transparent Intensional Logic (TIL), which is used here to capture meanings of expressions entering the MA in a sufficient level of detail.

TIL is a powerful logical system capable to rival the famous system by Montague [17]. For details of TIL and its applications to modalities, counterfactuals, belief sentences, verb tenses, verb aspects etc., see esp. Tichý [32, 33], [6], [25]. The rest of this section only offers a simplified exposition of TIL, which is nevertheless sufficient for our purpose.

The type base of TIL comprises four kinds of entities: individuals (e.g. Fido), truth values (viz. T, F), possible worlds (W\textsubscript{1}, W\textsubscript{2}, \ldots, W\textsubscript{n}), real numbers/moments of time (T\textsubscript{1}, T\textsubscript{2}, \ldots, T\textsubscript{k}). Various total and partial functions over such base exist – most notably extensions such as classes of \(\xi\)-objects (where \(\xi\)\textsubscript{\(i\)} is an arbitrary type) or \(m\)-ary linkages (relations-in-extension) between \(\xi_1\textsuperscript{-}, \xi_2\textsuperscript{-}, \ldots, \xi_m\textsuperscript{-}\) objects. Moreover, there are also intensions which have such extensions (or even other intensions) as their values in given \(\langle W, T\rangle\)s. A \(\xi\)-intension is thus a total or partial function from \(\langle W, T\rangle\)s to \(\xi\)-objects. Familiar kinds of intensions comprise propositions (e.g. FIDO IS A DOG; \(\xi = \) the type of truth values), individual concepts (e.g. THE WINGED HORSE; \(\xi = \) the type of individuals; Tichý’s original term: “individual offices”), (individual) properties (e.g. BEING A HORSE; \(\xi = \) the type of classes of individuals), \(m\)-ary relations (e.g. BELIEVE; \(\xi = \) the type of linkages between \(\xi_1\textsuperscript{-}, \xi_2\textsuperscript{-}, \ldots, \xi_m\textsuperscript{-}\) objects).

For many semantical investigations, a language can be viewed as a ‘code’ \(L\) which associates expressions with their meanings (see Section 5.1 for more). Intensional semantics models meanings as extensions or intensions in conformity with an intuitive lack or presence of modal and temporal variability in reference. For instance, an expression such as “dog” refers to a class of individuals in certain \(\langle W, T\rangle\)s, while it refers
to another class in another \( (W,T) \)s; the denotatum of “dog” is thus modelled as an intension (viz. a property) whose values (sometimes called: extensions) in various \( (W,T) \)s are classes of individuals.

As is well known, the analysis of belief attitudes as relations of agents towards possible world propositions is too coarse-grained: an agent believing various true mathematical ‘propositions’ (in an intuitive sense) does not have in all these cases an attitude to the single proposition that is true in all \( (W,T) \)s; neither does she have an attitude to the linguistic incarnations of such ‘propositions’. Sufficiently fine-grained, non-linguistic entities standing between expressions and intensions/extensions are needed: these are hyperintensions.

Arguably, one of the most plausible proposal of hyperintensions is Tichý’s [32] notion of construction. For comparable systems of neo-fregean hyperintensional analysis of meaning see esp. [19], [18]. Constructions are abstract, structured algorithmic procedures. They are recorded by, but not reducible to, some sort of \( \lambda \)-terms. Constructions construct objects (e.g. intensions); each construction is (abstractly) individuated by i. the object (if any) it constructs, ii. the way it constructs the object. Each object is constructed by infinitely many congruent constructions; constructions are congruent iff they construct, relative to a valuation, the same object or they both construct nothing at all.

To explain the behaviour of compound constructions, a construction written as “\( \lambda x[f\ x] \)” constructs a function from the values of \( x \) to the results of constructing of \([f\ x]\); dependently on valuation which gives values for variables \( x \) and \( f \), \([f\ x]\) constructs the value (if any) of the function which is the value of \( f \) on the argument which is the value of \( x \). The most primitive constructions correspond to constants, so they construct objects directly, without any change or support of any other construction; these so-called trivializations are written in the official TIL notation as \( 0\ X \), where \( X \) is any object; on any valuation, \( 0\ X \) constructs simply \( X \). Below, the sign “\( 0 \)” should be imagined in all occurrences from which it was deleted for the sake of notational simplicity. Further notational economy will be achieved by abbreviating “\([C\ w]\ t] \)” (where \( C \) is a construction) to “\( C_{wt} \)”. Some pairs of square brackets will be eliminated by dot convention according to which a dot stands in place of the left bracket and its mate should be imagined as far right as it is consistent.

Constructions serve in TIL as explicata of meanings: they are sufficiently fine-grained entities and they fittingly correspond to subexpressions. For example, the sentence “Fido is a dog.” expresses the con-
where the variable \( w \) constructs a possible world \( W \), the variable \( t \) constructs a moment of time \( T \), the construction \( \text{Dog} \) constructs the property \( \text{being a dog} \) and the construction \( \text{Fido} \) constructs the individual \( \text{Fido} \). By applying the property to \( W \) and \( T \) (which is executed by \( \text{Dog}_{wt} \)) one obtains the class \( M \) of individuals who instantiate the property in \( W \) and \( T \). The whole construction constructs a proposition which is true in \( W \) and \( T \) if Fido belongs to \( M \).

TIL thus utilizes a rich, post-Fregean semantic scheme: an expression \( E \) expresses in \( L \) a meaning \( C \) which constructs \( E \)’s denotatum \( D \) in \( L \). If \( E \) denotes, in \( L \), an intension, \( E \)’s referent in \( W, T \) and \( L \) is the value of the intension denoted by \( E \) in \( W, T \) and \( L \). If \( E \) does not denote an intension in \( L \), \( E \)’s referent in \( W, T \) and \( L \) is identified with its denotatum in \( L \). The last stipulation is useful for stating generally applicable claims concerning reference of both non-mathematical and mathematical expressions.

TIL is thus capable to distinguish – as e.g. Bach does – sameness in meaning, sameness in denotation and sameness in reference (Bach: “designation”):

<table>
<thead>
<tr>
<th>expressions</th>
<th>( E_1 )</th>
<th>( E_2 )</th>
<th>( E_1 )</th>
<th>( E_2 )</th>
<th>( E_1 )</th>
<th>( E_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>meanings in ( L )</td>
<td>( C )</td>
<td>( C_1 )</td>
<td>( C_2 )</td>
<td>( C_1 )</td>
<td>( C_2 )</td>
<td></td>
</tr>
<tr>
<td>denotata in ( L )</td>
<td>( D )</td>
<td>( D )</td>
<td>( D_1 )</td>
<td>( D_2 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>referents in ( W, T ) and ( L )</td>
<td>( R )</td>
<td>( R )</td>
<td>( R )</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Examples of expressions which are i. synonymous: “catastrophe”-“disaster”, ii. equivalent: “the Pope”-“the Archbishop of Rome” and “1 + 2”-“\( \sqrt{9} \)”, iii. coreferential: “the morning star”-“the evening star”.

## 5 Rigidity and Non-rigidity of Nominal Descriptions

### 5.1 Language in a Synchronic and Diachronic Sense

Before we proceed further, it is important to discuss the model of language we adopt because various semantic properties, including rigid-
ity, are language related. Philosophers of language often do not reveal whether they deploy language as a fixed set of expressions endowed with meanings – language in a synchronic sense, or language as a phenomenon evolving over time – i.e. in a diachronic sense.\(^{15}\)

Natural language \(\mathcal{L}\) surely is a complicated phenomenon which is partly normative in character. However, its coding devices that are actually used can be modelled by \(L\), a (partial) function which maps (Gödelized) expressions to meanings explicated as constructions. We can view the ‘code’ \(L\) as \textit{synchronously given language}.

Each code – a surrogate of \(\mathcal{L}\) – is specified by the association of certain expressions (as strings of letters over the alphabet of \(\mathcal{L}\)) with certain constructions. Some codes can be nearly identical, but differ in that, e.g. an expression lacking meaning in \(L\) has a certain meaning in \(L'\). When we say that a language \(\mathcal{L}\) has evolved, we mean that its \(L\) was replaced by \(L'\). We will understand language in a \textit{diachronic sense}, hereafter \(DL\), as an intension which has codes such as \(L\) or \(L'\) as its extensions.

Let us admit that proper names are parts of codes such as \(L\) or \(L'\). Before \textit{baptizing} an individual \(N\) with the name \(N\) at the moment of time \(T\), \(N\) was without meaning in \(L\), which is the extension of \(DL\) at \(T\) (in a given \(W\)).\(^{16}\) Thanks to the act of baptizing, which happens at the moment of time \(T'\), \(L'\) becomes the value of \(DL\); in \(L'\), \(N\) is meaningful, denoting \(N\) (which is the same as referring to \(N\) in \(W,T'\)). Below, \(N\) lacks meaning in \(L'\), while it has some meaning in \(L\).

5.2 Rigidity of expressions

Rigidity as a stable reference is a corollary of our assumptions and definitions:

\textbf{Def. rigidity}

An expression \(E\) is \textit{rigid} in \(L\) iff in every \(W\) and \(T\), \(E\) refers (if it refers to something), in \(L\), to one and the same object.

Realize that the consequence of \(E\)’s rigidity is that in \(L\), \(E\) typically denotes an extension or a constant intension which is not partial. The supplementation in the round brackets extends this definition of obstinate rigidity to the definition of persistent rigidity (which we adopt in this paper); partiality in referring is thus allowed.\(^{17}\) Examples of rigid expressions: (genuine) proper names, many mathematical expressions, connectives, quantifiers, etc.
From the definition of rigidity it is obvious what it means for $E$ to be not rigid. Though non-rigidity may be identified with it, I define it slightly differently: non-rigid expressions have variable reference.

**Def. non-rigidity**

An expression $E$ is *non-rigid* in $L$ iff such a $W$ and $T$ exist that $E$ refers, in $W, T$ and $L$, to an object $O$, and $W'$ and $T'$ exist such that $E$ refers (in $W', T'$ and $L$) to another object $O'$.

Examples of non-rigid expressions: morning star, unicorns, etc.

However, a discussion of the definition is needed: isn’t Kripke’s notion of rigid designation such that a singular term that picks out across a logical space and time-scale either an object $O$, or nothing at all is a rigid designator? I do not object to this claim (cf. also the next definition). However, the definition of non-rigidity that is adopted here seems to match Bach’s [4, p.375] discussion of the rigidity and non-rigidity of names and nominal descriptions.

Realize also that every non-rigid $E$ denotes in $L$ a non-constant intension. Since $L$ is a synchronically given language, it is excluded that, in a given $L$, $E$ denotes (as well as refers to) one extension $O$ in $W$ and $T$, whereas it denotes (as well as refers to) another extension $O'$ in another $W'$ and $T'$. Consequently, if $E$ seems to change its denotation, we switch from one code to another.

Now, one other category remains, that of *pseudo-rigid* expressions. They form a special class of not rigid expressions because they are stable as regards to the fact that they refer to nothing at all.

**Def. pseudo-rigidity**

An expression $E$ is *pseudo-rigid* in $L$ iff in every $W$ and $T$, $E$ refers, in $L$, to no object.

In $L$, a pseudo-rigid $E$ denotes either no extension or intension, $E$ is thus a ‘non-designator’, or $E$ denotes a constant partial intension, i.e. an intension undefined for all $⟨W,T⟩$s. Examples of pseudo-rigid designators: (genuine) empty proper names (“Vulcan”), “the greatest prime number”, “$(3 ÷ 0)$”.

### 5.3 Three Kinds of Nominal Descriptions

My resolution of the comments of NDTians regarding the MA against NDT is rooted in distinguishing three possible meanings of the nominal...
description “the bearer of $N$”, and thus also three possible meanings of $N$ according to NDT.

The possible meanings are suggested in the system of definitions displayed in the following table. Each definition is a deduction rule relating couples of constructions which are congruent. In the first column, we read three possible meanings of $N$; in the second column, we read three possible meanings of “the bearer of $N$”; in the third column, we state important congruent constructions (‘equivalents’).

The meanings of rigid / pseudo-rigid / non-rigid nominal descriptions and their equivalents

\[
\begin{align*}
N^L &\iff \lambda w \lambda t. \lambda x [B^L_{wt} x N] \iff \lambda w \lambda t. \lambda x [x = [L \, N]] \\
N^{L'} &\iff \lambda w \lambda t. \lambda x [B^{L'}_{wt} x N] \iff \lambda w \lambda t. \lambda x [x = [L' \, N]] \\
N^{DL} &\iff \lambda w \lambda t. \lambda x [B^{DL}_{wt} x N] \iff \lambda w \lambda t. \lambda x [x = [DL_{wt} \, N]]
\end{align*}
\]

As is clear especially from the third column of the table, the ‘parameters’ $w$ and $t$ are ‘unproductive’ in the constructions presented in the first two rows because it is not a contingent matter whether the value of $x$ is a bearer of $N$ in $L$ or $L'$. On the other hand, it is a contingent matter whether the value of $x$ is a bearer of $N$ in the extension of $DL$.

Each of the three constructions in the first row constructs an individual concept which picks out $N$ in all $\langle W, T \rangle$s, i.e. a constant intension. Each of the three constructions in the second row constructs the individual concept which picks out nothing in all $\langle W, T \rangle$s, i.e. a constant intension which is partial. Each of the three constructions in the third row constructs an individual concept which:

a. picks out $N$ in those $\langle W, T \rangle$s in which the extension of $DL$ is $L$,

b. picks out no individual in those $\langle W, T \rangle$s in which the extension of $DL$ is $L'$,

c. picks out another individual than $N$ in those $\langle W, T \rangle$s in which neither $L'$, nor a code similar to $L$ as regards $N$, is the extension of $DL$.

The above stated properties of the nine constructions have consequences for the rigidity of proper names as explicated by NDT and the corresponding nominal descriptions:
Rigidity / pseudo-rigidity / non-rigidity of proper names and nominal descriptions

| rigidity | $N^L$ | “the bearer of $N$ in $L$” |
| pseudo-rigidity | $N^{L'}$ | “the bearer of $N$ in $L'$” |
| non-rigidity | $N^{DL}$ | “the bearer of $N$ in $DL$” |

Finally, let us add that $\text{BEARER}^L$ as well as $\text{BEARER}^{L'}$ – constructed by $B^L$ and $B^{L'}$, respectively – is a ternary relation between individuals, (Gödelized) expressions and codes (the construction of which are written in the superscript close to “B”). In the case of $\text{BEARER}^{DL}$, which is constructed by $B^{DL}$, the last relatum is not a code but a code-in-intension, i.e. $DL$.

6 Six Versions of the $\text{MA}^{NDT}$

6.1 Validity of versions of the $\text{MA}^{NDT}$

Using the disambiguations of nominal descriptions and proper names suggested in the preceding section, we may discover a number of versions of the $\text{MA}^{NDT}$. 20

As mentioned above, I restrict our attention to the versions which employ Bach’s NDT, not the NDT which maintains the identity of meanings of $N$ and “the bearer of $N$”. In the antecedent of the $\text{MA}^{NDT}$’s first premise (and then negated in the $\text{MA}^{NDT}$’s conclusion), it thus appears to be a statement about equivalence which follows on from the relevant definition; I call the statement an $NDT$ thesis. I discriminate between three versions of this thesis which differ in the proper names and nominal descriptions utilized within them. Here is one of the three NDT theses:

NDT thesis ($L$-version)

| sentence | “$N^L$ is equivalent to “the bearer of $N^L$”.” |
| its meaning | $\lambda w \lambda t[N^L = \lambda w \lambda t.\lambda x[B_w^L, x, N]]$ |

In the consequent of the $\text{MA}^{NDT}$’s first premise and then in the $\text{MA}^{NDT}$’s second premise, truth or falsity is ascribed to a statement describing the modal profile of $N$ and “the bearer of $N$” in question. For easy reference I will call such a statement an ascription of rigidity and I will use below versions of such a statement which indicate worlds and
times of evaluations – as is clear from its fully formalized versions. Here is one ascription of rigidity in both wide and narrow scope variants:

**Ascription of rigidity (L-version in wide / narrow scope)**

**wide scope:**

<table>
<thead>
<tr>
<th>sentence</th>
<th>“N^L_{wt} might not be the bearer_{w′t′} of N^L.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>its meaning</td>
<td>λwλt.∃λw′∃λt′[N^L_{wt} ≠ [the λx[B^L_{w′t′} x N]]]</td>
</tr>
</tbody>
</table>

**narrow scope:**

<table>
<thead>
<tr>
<th>sentence</th>
<th>“N^L_{w′t′} might not be the bearer_{w′t′} of N^L.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>its meaning</td>
<td>λwλt.∃λw′∃λt′[N^L_{w′t′} ≠ [the λx[B^L_{w′t′} x N]]]</td>
</tr>
</tbody>
</table>

We will find that there are altogether six valid versions of the MA^{NDT}. Among them, we can recognize three pairs whose members differ by systematically employing either wide or narrow scope for both N and “the bearer of N”.

Any other version of the MA^{NDT} would contain both scopes, i.e. a scope would shift within a particular argument. Such arguments do not have the form of modus tollens and so their validity is not guaranteed. Such versions of the MA were probably not intended by Kripke and his allies.

Let us begin with the version of the MA^{NDT} which utilizes N^L and “the bearer of N^L” in wide scope:

**N^L-version of the MA^{NDT} – wide scope**

(a) If N^L is equivalent to “the bearer of N^L”, then ‘N^L_{wt} might not be the bearer_{w′t′} of N^L’ is false.
(b) ‘N^L_{wt} might not be the bearer_{w′t′} of N^L’ is true.
(c) ∴ N^L is not equivalent to “the bearer of N^L”.

It is easy to check that the bearer of N^L in the values of w and t, i.e. N, cannot be non-identical to the bearer of N^L in the values of w′ and t′, i.e. with itself. The ascription of rigidity recorded within the single quotation marks is thus false – which is what the consequent of (a) says; it is true, while (b) is false.

Changing scope from wide to narrow makes no difference. I show here only the first premise of the respective N^L-version:
The modal argument and nominal description theory

**N^L-version of the MA^NDT – narrow scope (1st premise only)**

(a) If \(N^L\) is equivalent to “the bearer of \(N^L\),
then \(\text{‘}N^L_{w't'}\text{’ might not be the bearer}_{w't'}\text{ of }N^L'\) is false.

The bearer of \(N^L\) in the counterfactual circumstances which are the values of \(w'\) and \(t'\) is N and N cannot be non-identical to itself as the referent of “the bearer of \(N^L\).”

Considering both wide and narrow scope versions of the MA^NDT with \(N^L'\) leads to the very same result.

We may conclude that wide or narrow scope makes no difference if the MA^NDT is understood in its \(N^L\)- or its \(N^L'\)-version.

Nevertheless, both Loar and Bach complained that there is a ‘shift of scopes’. This difference can only be detected if one considers the \(N^{DL}\)-versions.

Let us begin with the wide scope variant.

**N^{DL}-version of the MA^NDT – wide scope (1st premise only)**

(a) If \(N^{DL}\) is equivalent to “the bearer of \(N^{DL}\),
then \(\text{‘}N^{DL}_{w't'}\text{’ might not be the bearer}_{w't'}\text{ of }N^{DL'}\) is false.

It is easy to check that if \(L\) is the extension of \(DL\) in the values of \(w\) and \(t\), then the bearer of \(N^{DL}\) is N. But the description “the bearer of \(N^{DL}\)” does not refer to N necessarily – remember, e.g. \(L'\), which is a possible extension of \(DL\). Thus, the consequent of (a) is false, whereas (b) is true.

On the other hand, the MA^NDT in its \(N^{DL}\)-version with narrow scope has a different distribution of truth values.

**N^{DL}-version of the MA^NDT – narrow scope (1st premise only)**

(a) If \(N^{DL}\) is equivalent to “the bearer of \(N^{DL}\),
then \(\text{‘}N^{DL}_{w't'}\text{’ might not be the bearer}_{w't'}\text{ of }N^{DL'}\) is false.

It is obvious that if \(L\) is the extension of \(DL\) in the values of \(w'\) and \(t'\), then the bearer of \(N^{DL}\) cannot be non-identical to the individual to
which “the bearer of \(N^{DL}\)” refers in \(L\). Thus, the ascription of rigidity recorded in the consequent of (a) is false; the consequent of (a) is thus true, whereas (b) is false.

We thus reach an important conclusion: a mismatch of wide and narrow scope within the \(MA^{NDT}\) is reasonably possible only if \(N\) is understood as \(N^{DL}\); which is equivalent to the non-rigid nominal description “the bearer of \(N^{DL}\)”.

A further important conclusion arises if we recall that Kripke explicitly tied questions of rigidity to a particular ‘stage’ of language, i.e. \(L\), without allowing this \(L\) to be changed to, e.g. \(L'\). He excluded any ‘evolving language’ \(DL\) from considerations of counterfactual situations.

When I say that a designator is rigid, and designates the same thing in all possible worlds, I mean that, as used in our language, it stands for that thing, when we talk about counterfactual situations. . . . we use English with our meanings and our references ([14, p.77]; italics in the original)

Since Loar and Bach relied on the non-rigidity of the nominal description “the bearer of \(N\)” and so of the proper name \(N\) (which is supported by their opinions concerning shifts of scopes and which is possible only when \(DL\) is considered), they evidently did not share the same assumption with Kripke. This naturally affects the assessment of the soundness of the \(MA^{NDT}\).

6.2 Soundness of versions of the \(MA^{NDT}\)

For the purposes of our investigation of soundness, here is a concise overview of distributions of truth values through versions of the \(MA^{NDT}\) for which we presuppose along with Loar and Bach that the NDT thesis is right.

**Distribution of truth values through versions of the \(MA^{NDT}\)**

<table>
<thead>
<tr>
<th>(N^{L/L'})-versions</th>
<th>wide / narrow scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>premise ((a))</td>
<td>(T \rightarrow T)</td>
</tr>
<tr>
<td>premise ((b))</td>
<td>(F)</td>
</tr>
<tr>
<td>conclusion ((c))</td>
<td>(F)</td>
</tr>
</tbody>
</table>
The Modal Argument & Nominal Description Theory

<table>
<thead>
<tr>
<th>$N^{DL}$-version</th>
<th>wide scope</th>
<th>narrow scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>premise (a)</td>
<td>$T \rightarrow F$</td>
<td>$T \rightarrow T$</td>
</tr>
<tr>
<td>premise (b)</td>
<td>$T$</td>
<td>$F$</td>
</tr>
<tr>
<td>conclusion (c)</td>
<td>$F$</td>
<td>$F$</td>
</tr>
</tbody>
</table>

The MA$^{NDT}$ is obviously not sound even in the cases which do not utilize the non-rigid terms $N^{DL}$ and “the only bearer of $N^{DL}$”.

One may then ask why Loar and Bach preferred the $N^{DL}$-version with wide scope to its narrow scope variant. An admissible answer can be given after recapitulating Kripke’s standpoint.

Consider the original MA and admit that Kripke restricted the MA to non-rigid ordinary descriptions only. It is then an analytic truth that $N$, being synonymous with a description, is a non-rigid designator – (a) is thus true. Since Kripke assumed only a synchronic language $L$, every (non-empty) $N$ is a rigid designator – (b) is thus also true. Thus, the consequent of (a) is false. If (a) is true, its antecedent must be false. Thus, (c) is true. Kripke’s MA is therefore clearly sound and the NDT thesis, a special case of Descriptivism, is disproved and shown to be false.

Distribution of truth values through the MA

| premise (a) | $F \rightarrow F$ |
| premise (b) | $T$           |
| conclusion (c) | $T$         |

One can only guess why Loar and Bach discussed the MA$^{NDT}$, which mainly differs from Kripke’s MA in the distinct distribution of negations through the consequent of its first premise and its second premise (as we have noticed in Section 3.1). Now, if we assume with NDTians that i. the NDT thesis is true and that ii. proper names are non-rigid designators (since they are equivalent to the non-rigid descriptions “the bearer of $N^{DL}$”), Kripke’s MA is transformed into an $N^{DL}$-version of the MA$^{NDT}$ with narrow scope. However, there is something strange about this argument because “[n]ames are normally read as having wider scope than modal operators”. As a result, there seems to be some confusion between the $N^{DL}$-version of the MA$^{NDT}$ with narrow scope (= an NDTian reading of Kripke’s MA) and the more preferable version with wide scope. Because of the confusion concerning the variants of the $N^{DL}$-version, “[t]he argument is defective”.

Now realize that the soundness of the MA does not depend only on whether one assumes the validity of NDT. Kripke’s MA rules out NDT by
relying on the non-rigidity of a description which should be synonymous with or equivalent to a proper name, whereas the name must be a rigid designator. On the other hand, if we drop Kripke’s assumption and allow, as NDTians do, the non-rigidity of proper names and nominal descriptions, the MA cannot be sound. To easily check this fact, here is an adaptation of Kripke’s MA against NDT which incorporates the assumptions of NDTians:

Kripkean MA against NDT ($N^{DL}$-version) 

If a proper name $N^{DL}$ has the same meaning as the nominal description “the bearer of $N^{DL}$”, $N^{DL}$ is not a rigid designator.

A proper name $N^{DL}$ is a rigid designator.

\[ \therefore A \text{ proper name } N^{DL} \text{ does not have the same meaning as the nominal description “the bearer of } N^{DL}”. \]

7 Conclusions

What we have found?

The MA against NDT is valid because it is an instance of modus tollens.

A mismatch of scopes of singular terms within the MA, resulting in invalid versions of the MA$^{NDT}$, would be a result of an inconvenient specification of the MA. There are six valid versions of the MA$^{NDT}$ in which the scopes are not mismatched.

The MA$^{NDT}$ used by Loar and Bach differs from the natural adaptation of Kripke’s MA because the negation of the claim which expresses the rigidity of a proper name (which is supposed to be correlative with a nominal description) occurs in another premise.

Kripke’s MA against NDT is sound only if one accepts that proper names are rigid designators. The MA$^{NDT}$ is not sound for Loar and Bach because they consider proper names and the corresponding nominal descriptions to be non-rigid, which follows from their assumption that language evolves – while Kripke explicitly rejected to apply the notion of rigidity to evolving languages.

Recall that the scope of this paper does not extend to a refutation of NDT. To disprove the ‘synonymy version’ of NDT, one can aptly use a Semantic Argument: unlike any proper name $N$, the nominal description “the bearer of $N^{(L)}$” is obviously semantically loaded because “bearer of $N^{(L)}$” is the English name of a metalinguistic semantic relation –
notwithstanding Bach [1, p.73], who claims that the relation is “not substantive”. To disprove Bach’s ‘equivalence version’ of NDT would be much more difficult: if a proper name has the construction $N^{DL}$ as its meaning, the semantic character of the meaning and the relation determined by it is hidden; one could only argue against the non-rigidity of the name – which could, however, be easily contradicted by pointing to the facts that language evolves and that names contingently acquire and lose bearers.

**Acknowledgements**

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**Notes**

1 To remind the reader, according to NDT the proper name $N$ means the same as, or is at least equivalent to, the nominal description “the bearer of $N$”.

2 Except for e.g. [30], defenders of Millianism or Direct Reference Theory usually reject the idea that these theories explicate the meaning of proper names, claiming that they rather focus on the reference of such names.

3 Admittedly, the model is a little bit too simple: it cannot properly capture various linguistic data – as was shown e.g. in [4, 3], [10].

4 Of course, in the case of names in fiction, this is a problem just for irrealist theories, whereas realist theories escape the problems by positing special kinds of entities performing the role of referents. (I owe this remark to the reviewer.)

5 For a convenient discussion of Descriptivism see e.g. [7].

6 “If the name *means the same* as that description or cluster of descriptions, it will not be a rigid designator.”, [14, p.57].

7 “[P]roper names are rigid designators”, [14, p.49].

8 For a clear discussion of widescopism in particular see e.g. [5].

9 Though Bach does not draw our attention to that he thus escaped the Semantic Argument against NDT which relies on the intuition that $N$ obviously does not mean ‘the bearer of $N$’. Cf. Section 7 for more.

10 A similar version of NDT was launched by Zouhar [37].

11 Recanati’s proposal was criticized by Predelli [20], who called it the *New Linguistic Theory* of Proper Names to contrast it with Bach’s *Linguistic Theory*.
Loar, Bach and others also defended NDT against Kripke’s accusation of circularity, which I will not discuss in here.

Here, Bach accepted that the meanings of $N$ and “the bearer of $N$” are not just equivalent – they are the same.

The conception of possible worlds of this approach is described in details in [24].

The content of this section is elaborated in much greater detail in [21].

The view that a name can refer to no object in $L$, maintaining also that it is without a meaning in $L$, amounts to saying that it belongs to $L$ as a meaningless string of letters over the alphabet of $L$.

Cf. [28] and further sources for discussions of the “obstinate / persistent rigidity” distinction. A convenient modification of my earlier definition(s) was suggested to me by an anonymous reviewer.

For recent examination of various notions of rigidity see [35, 36, 34].

In the definitions, the construction written as “the” constructs the singularization function which maps singletons to their sole members and it is undefined otherwise. Each construction $B^L$, $B^{L'}$, $B^{DL}$ constructs a relation applicable to the relata constructed by other constructions written in the square brackets; we will return to them below in this section. By $\beta$-conversion rule of $\lambda$-calculus, we will write “[$\ldots wt\ldots]$” instead of “[$\lambda w\lambda t[\ldots wt\ldots]_{wt}$”.

Some ideas of this section appeared in [23, 22].

The variables $w'$ and $t'$ indicate counterfactual situations. The proper binding devices are $\lambda$s, whereas $\exists$ is a predicate ascribing non-emptiness to the class constructed by the $\lambda$-abstract written behind this $\exists$. To avoid problems with partiality, $[\ldots \neq \ldots]$ is understood here as ‘it is not true that $[\ldots = \ldots]$’.

Needless to say that by NDTians I mean here mainly Bach.

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