



***This text is called (an) article:***  
**Referring nouns in name-informing quotation\***

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**Cortés Rodríguez, Álvaro, Holden Härtl, Natascha Raue, and Kristina Weissbecker. 2022.** *This text is called (an) article: Referring nouns in name-informing quotation.* *Linguistic Research* 39(2): 327-354. This paper examines quotations involving predicates like *call* or *refer* to that inform the addressee about the name of a lexicalized concept. Quotations of this sort often contain names that are accompanied by a determiner, e.g., *This phenomenon is called a “sun halo.”* We claim that name-informing constructions imply an underspecified copular relation which entails a referring interpretation of the name. Crucially, the determiner is optional in name-informing quotations, cf. *This phenomenon is called “sun halo.”* Specifically, our studies aim to determine whether the name in name-informing constructions is perceived as referentially more salient when it is accompanied by a determiner. To test this, three experimental studies were conducted, employing forced-choice tasks, acceptability judgment, and self-paced reading paradigms. Those three experimental methods showed non-significant differences indicating an equivalent behavioral treatment of the two alternatives. Therefore, we conclude that names used in name-informing constructions accompanied by a determiner do not differ referentially from uses not involving a determiner. The data thus suggest that the two realizations of name-informing constructions are semantically equivalent and entail identical semantic features. (University of Kassel)

**Keywords** quotation, names, name-informing constructions, copula, referentiality

## 1. Introduction

The referential features of nominal expressions and the referential role a noun can play in specific sentential and contextual configurations have been studied for a long time in the fields of compositional and discourse semantics. A factor often used as an indicator of a noun’s referential status is its anaphoric potential, i.e., the capacity of the noun to

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be referred to with an anaphor in the subsequent discourse. Consider the examples in (1).

- (1) a. ??The beer<sub>i</sub> drinker enjoyed it<sub>i</sub> with a club sandwich.  
 b. A word with three syllables is “telephone.” ??It<sub>i</sub> was invented by Alexander Bell.  
 c. “Computer<sub>i</sub>” is an English word. ??Every family owns one<sub>i</sub>.  
 d. Meine Schwester ist ein guter Schüler<sub>i</sub>. ??Jeder hat ihn<sub>i</sub> gern.  
 ‘My sister is a good student. Everybody likes him.’

In the above examples, the anaphoric reference of the pronouns to the indexed nouns is blocked. As concerns (1), the blocking can be explained by the fact that the compound *beer drinker* is an anaphoric island (Postal 1969) and subject to the lexical integrity principle (e.g., Lapointe 1980; Anderson 1992), which entails that the compound’s non-head *beer* cannot function as the antecedent of the pronoun *it*. In the example in (1b), the linguistic shape of *telephone* is mentioned, and, thus, the expression is used metalinguistically (Quine 1981). As a result, matching is available to bind the pronoun contained in the subsequent sentence. An analogous explanation holds for the example in (1c). Last, in the German example in (1d), the masculine noun phrase *ein guter Schüler* (‘a good student’) functions as a predicative in the copular sentence (e.g., Geist 2006). Hence, the phrase is not used referringly, and it is not a suitable antecedent for the gender-matching masculine pronoun occurring in the second sentence.

While non-referring noun uses of the type in (1) are well understood, cases where an expression can be both referring and non-referring are a widely understudied phenomenon. One such instance are constructions in which an expression is used referringly. Another case is when the linguistic shape of this expression is mentioned. Consider the following examples:

- (2) a. The doctors diagnosed a so-called “sepsis”.  
 b. This phenomenon is called a “sun halo”.  
 c. This phenomenon is called “sun halo”.

The examples in (2) represent a special case of pure quotation (Härtl 2018, 2020). The example in (2a) contains the DP *a so-called “sepsis”* functioning as the internal

argument of the verb *diagnose*. The expression saturates the verb's theme role and is thus used referringly. At the same time, the DP contains the quoted expression "*sepsis*," which functions as the name argument required by the verbal root *call-* of the modifier *so-called*. The latter use is a metalinguistic, i.e., non-denotational, use of *sepsis*. Likewise, the quoted material in the example in (2b) displays a linguistic shape, in this case, the shape of the conventionalized name for a certain optical phenomenon, that is, a sun halo. Crucially, in this example, a determiner (an indefinite article, to be precise) accompanies the quoted material, which again suggests that the expression is used denotationally and metalinguistically simultaneously. Note that the determiner can also be left out in constructions of this type, see (2c). This may give rise to the notion that the quoted nominal is somehow "less referring" in such cases due to the fact that the nominal seems to be only mentioned here. Such an assumption is built on the observation that expressions used metalinguistically in a quotation are not directly accessible to anaphoric reference, which would, in turn, establish links to the standard denotational meaning of the expression in quotes.

The present paper is the first approach aimed at exploring the characteristics of referential hybrids of the type in (2) from an experimental angle. To address the issue, we focus on how the use of such hybrid expressions in those constructions interacts with other factors such as the use of quotation marks, the presence or absence of a determiner, or pronominal access to that expression. A crucial part of the investigation is the interpretation of null effects among the factors as well as the theoretical implications we can draw from them with respect to, for example, the semantic representation for referential hybrids.

The structure of this paper is as follows: In section 2, we will examine name-informing quotations from a theoretical semantic point of view and argue that this type of quotation involves an underspecified copular relation. Section 3 introduces three experimental studies. First, a forced-choice survey is presented in which the occurrence of quotes in name-informing constructions was rated by native speakers of German with regards to the construction being preceded or not by a determiner. Second, we provide data from an acceptability judgment study for name-informing constructions modulated by the presence or absence of a determiner. And third, a self-paced reading experiment is reported where the latency for anaphoric resolution of nominal expressions introduced

by name-informing constructions is investigated. Section 4 concludes with a potential analysis for name-informing constructions.

## 2. Name-informing quotation: A copula-based approach

A quotation is a metalinguistic device used to talk about certain dimensions of language (see, e.g., Davidson 1979; Cappelen and Lepore 1997; Saka 1998). In quotational constructions, expressions are mentioned rather than or in addition to being used denotatively. With an assertion like in (3a), for example, in contrast to (3b), the syllabic setup of the word *sun halo* is described, and the quotation marks around the word indicate this use, which means reference is made to a linguistic dimension of the quoted expression (see, e.g., Quine 1981).

- (3) a. “Sun halo” has three syllables.  
 b. A sun halo is a circle around the sun.

The referential difference between a denotatively used and a mentioned expression occurring in this type of quotation is reflected in the incompatibility of the mentioned noun to be used with a determiner, as is illustrated in (4).

- (4) \*A “sun halo” has three syllables.

Observe, however, that in quotational constructions of the type in (5), the quoted noun can occur with a determiner.

- (5) a. This phenomenon is called a “sun halo”.  
 b. The low voltage side of the system is referred to as the “primary circuit”.

The determiner is optional. A referring (i.e., denotational) use of the quoted noun is unexpected in the sentences in (5), given that these quotations, similar to the one in (2a), inform the addressee about the (conventionalized) linguistic shape of the

corresponding denotatum's name, i.e., “*sun halo*” and “*primary circuit*,” respectively. Furthermore, accusative case is assigned to the named constituent when accompanied by an article, cf. German *Man nennt diese Erscheinung einen / ??ein „Sonnenring“* (‘One calls this phenomenon a-acc / ??a-nom “sun halo”). Conversely, the name does not show accusative case inflection when not accompanied by an article, cf., *Man nennt eine solche Person „Herr von Welt“ / einen „Herrn von Welt“* (‘One calls such a person “gentleman.nom of world” / a “gentleman.acc of world”).<sup>1</sup> These observations suggest that the determiner is not a constituent part of the linguistic shape mentioned in the quotation,<sup>2</sup> and that we are dealing with a full DP when the name is accompanied by an article. This raises the question about the source of the referring interpretation of the mentioned names in these cases.

We refer to constructions of the type in (5) as name-informing constructions (NICs). They contain predicates like *call*, *refer to*, *name*, etc., as embodied in (5a) and (5b) as well as in (6) below, and are used to display the linguistic shape of a concept's conventionalized name.

- (6) a. One calls this disease “sepsis”.  
 b. A function that calls itself is named “recursive function”.  
 c. The purity of gold is referred to with the word “karat”.

As argued in Härtl (2018), quotations of this sort are instances of pure quotation, i.e., a metalinguistic device used to demonstrate linguistic shapes in a rule-like fashion (see, e.g., Davidson 1979; Cappelen and Lepore 1997; Maier 2014). A standard case of pure quotation is represented in the example in (2a) above. As an explication of their metalinguistic status, pure quotations can constitute an appositive noun phrase, for instance, when the nominal is preceded by expressions like *the word*, as exemplified in (6c).

Name-informing predicates like *call* are three-place predicates, which require an argument that can be interpreted metalinguistically. In cases like (5) and (6), the predicates are used to describe a naming convention. The sentence in (5a), for example,

1 We wish to thank an anonymous reviewer for this observation.

2 This assumption is also supported by data taken from the German DeReKo corpus (IDS Mannheim), which reveal that a determiner of a mentioned noun occurs almost never inside the quotation when quotation marks are used in constructions of the type in (5) in German.

asserts that a certain optical occurrence (*this phenomenon*) is commonly referred to as “*sun halo*.” Thus, the verbal root of *call* involves three thematic arguments: an agent  $x$ , which is bound generically, a theme  $y$ , and a relational argument that, in this case, introduces a shape “ $n$ ” of the name of the theme argument  $y$  (see Härtl 2020: 293).<sup>3</sup>

- (7) a.  $x$  call-  $y$  “ $n$ ”  
 b.  $\lambda y \lambda n \lambda x$  [CALL( $x$ ,  $y$ , NAME(“ $n$ ”,  $y$ ))]  
 c. GEN $x$  [CALL( $x$ , *this phenomenon*, NAME(“*sun halo*”, *this phenomenon*))]

To explain referring uses of nouns occurring in name-informing constructions, Härtl (2020) proposed the construction to involve an underspecified copular relation  $P$  in the predicate’s verbal root. Crucially, it is this copula that can introduce a referring nominal, manifested through the determiner. Consider the semantic form in (8).

- (8)  $\lambda P \lambda y \lambda n \lambda x$  [CALL( $x$ ,  $y$ , NAME(“ $n$ ”,  $y$ )  $\wedge$  P( $n$ ,  $y$ ))]

Here,  $P$  is assumed to identify the particular relation holding between the denotation of the name  $n$ , mentioned as “ $n$ ” in a name-informing construction, and the theme argument  $y$ . In support of the copula assumption, let us reconsider the example in (5), repeated in (9) below, where the denotation of the theme argument and the denotation of the name are identical in the relevant discourse domain.

- (9) a. This phenomenon is called a “sun halo”.  
 b. [[*this phenomenon*]] = [[*a sun halo*]]

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3 Naming predicates are highly polysemous. In the current study, we focus on the name-informing meaning of CALL that is used to express a naming convention, as exemplified in (5) and (6) above. Thus, we exclude from the analysis other readings like the “misnomer” reading of CALL, where the agent argument is not bound generically, cf. *Tom calls his thought a “theory”, but it is not really a theory.*

- (10) a. This phenomenon is called a “sun halo” and this phenomenon is a sun halo.
- b. <sup>z</sup>This phenomenon is called a “sun halo” but this phenomenon is not a sun halo.<sup>4</sup>
- c. <sup>z</sup>This phenomenon is not called a “sun halo” but this phenomenon is a sun halo.

The copular relation holding between the two arguments can be made explicit, see (10a), and it cannot be negated, see (10b). The contradiction produced in (10b) suggests that a relation of the type in (9b) is entailed as part of the truth-conditional meaning of the sentence in (10a). Analogously, a contradiction is produced when the CALL component is negated but not the copular relation, see (10c), which we take to indicate that the copular relation is inside the scope of CALL in sentences of the type under investigation.<sup>5</sup> As argued in Härtl (2020), the copular relation involved in name-informing constructions of the type at issue in this study materializes as an identificational copula. Typically, identificational copular sentences contain a demonstrative or a definite nominal expression (as subject) and are used to indicate the names of people or things introduced in the postcopular phrase (see, among others, Higgins 1979; Mikkelsen 2011). Heller and Wolter (2008) argue that the postcopular expression in an identificational sentence denotes a sort or a kind. This is exactly what we observe in the covert copular sentence contained in the construction under consideration, which always specifies the sort of the theme referent, cf. (11) and (12).<sup>6</sup>

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4 One of the reviewers has pointed out that such a sentence is only unacceptable if the name is transparent or compositional, and suggests the example *Dieses Werkzeug wird Engländer genannt, aber es ist natürlich kein Engländer* (‘This tool is called Englishman, but it is of course no Englishman’), which seems acceptable. This observation is certainly correct, and we thank the reviewer for the comment. It is important, however, to consider that this particular example involves two semantically distinct meanings of *Engländer*: the tool, on the one hand, and the person, on the other. The presence of the adverb *natürlich* (‘of course’) as well as the two mentionings of the word *Engländer* (lit. ‘Englishman’) have information-structural implications, necessary to produce the intended reading. A contrast between the two meanings of the word *Engländer* is evoked. Furthermore, it is not clear that such sentences are entirely acceptable. They require appropriate intonation and include an addendum that the tool is not a “real” Englishman. In the example in (10b), on the other hand, we are dealing with one and the same meaning of *sun halo*, which is why a negation renders the sentence illogical and therefore unacceptable.

5 This observation is based on a reviewer’s comment.

6 The subject in identificational copular sentence has a different semantic type than the subject of predicational copular sentences, see, for example, Geist (2006). This is reflected grammatically in the fact that the subject

- (11) a. This phenomenon is called a “sun halo”.  
 b. This phenomenon is a sun halo.
- (12) a. One calls this disease “sepsis”  
 b. This disease is a sepsis.

So far, the question has been unanswered whether the implicit copula is consistently entailed by a name-informing predicate as part of the predicate’s lexical meaning or whether the copula materializes compositionally only in cases where the mentioned noun is used referringly and is, thus, accompanied by a determiner. The latter assumption would imply that mentioned nouns used with a determiner in a name-informing construction are somehow “more” referential than nouns used without a determiner in the construction.<sup>7</sup> An alternative approach could be based on the claim that the two realizations of name-informing constructions, i.e., those involving a determiner and those not involving a determiner, are semantically identical and entail identical semantic properties, as represented in the semantic form in (8). Under such a view, when the noun is used without a determiner (*This phenomenon is called “sun halo”*), the NAME argument in the semantic form of CALL is spelled out, see (8) above. When the noun is used with a determiner (*This phenomenon is called a “sun halo”*), under said view, the copular relation (*P*) is spelled out. We will address this issue from a variety of empirical perspectives in the rest of this paper.

### 3. Empirical approaches to the referentiality of name-informing quotations

Our research question is whether nouns occurring with a determiner in name-informing constructions are referentially more salient than nouns figuring without a determiner. We define referential salience as a function of the activation of a referent’s conceptual representation in the discourse model (see, e.g., Arnold and Griffin 2007).

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of an identificational copular sentences can only be referred to with a non-referential pronoun, e.g., in a left-dislocation configuration, see, e.g., Härtl (2020) for details.

7 Note that we do not maintain that the name constituent is more referential when accompanied by a definite article because it is identificational. Our hypothesis is that the naming constituent is more referential when accompanied by an article because it not just mentioned, i.e., used metalinguistically, but – presumably – also used referringly at the same time.



The notion implies that the more referentially salient an entity is, the more easily it can be accessed in discourse operations targeting that referent.

The above question derives from the assumption that, as argued in the previous section, name-informing constructions involve an implicit copula. The analysis entails that the noun mentioned in a name-informing construction figures as a referential hybrid, that is, on the one hand, it figures as an expression that is mentioned with respect to its linguistic shape, see (13b), and, on the other, it used with its standard denotation see (13c).

- (13) a. This phenomenon is called a “sun halo”.
- b. → The name of this phenomenon is “sun halo”.
- c. → This phenomenon is a sun halo.

It is an open question whether the entailment of a copular relation can be assumed to be similarly prominent for nouns used without a determiner in a name-informing construction, see the contrast in (14).

- (14) a. This phenomenon is called “sun halo”.
- b. → The name of this phenomenon is “sun halo”.
- c. ?→This phenomenon is a sun halo.

Note that providing an answer to this question has implications for the semantic analysis of name-informing constructions. If the referential status of a noun with and without a determiner differs, this would call for distinct underlying semantic representations for the different constructions’ occurrences.

As a first approach to this issue, Härtl (2020) employed the use of quotation marks as an indicator of the referential status of nominals mentioned in name-informing constructions. Quotes and their respective material realization are a device used to draw the addressee’s attention to the mentioning use of an expression. The pragmatic approaches we follow here implement quotes as pragmatic markers used to indicate a deviation from the standard, denotational use of an expression and give rise to a non-stereotypical interpretation instead (see, e.g., Klockow 1978; Gutzmann and Stei 2011; Härtl 2018). Regarding name-informing quotation, the occurrence of a noun

accompanied by a determiner can be hypothesized to correlate with a higher probability of quotes, reflecting a compensating strategy to highlight the name's metalinguistic use in the underlying copular sentence. To test this hypothesis, a pilot corpus study was conducted in German. The results indicate that the occurrence of a determiner has a positive effect on the occurrence of quotes: Nouns mentioned in name-informing constructions were more prone to be used with quotes when they were accompanied by a determiner, i.e., when used referringly.

The above findings must be viewed with caution since the data set analyzed in the study was limited in size, and register (mostly newspaper texts extracted from the German DeReKo corpus, IDS Mannheim) may have influenced the use of quotes as a formal graphemic device. To better understand this issue, we tested the correlation between determiner use and the use of quotes in a controlled experimental setting. We report this study in the following section.

### **3.1 Study 1: Forced-choice survey**

The study presented in this section was a forced-choice experiment (see Raue 2020), in which participants were asked to rate the appropriateness of quotes in various syntactic constructions. The purpose was to test whether there was a correlation between the predilection in the use of quotes depending on the type of sentence featuring as the antecedent. We hypothesize a positive correlation between name-informing constructions involving a determiner and the preference for quote usage.

#### **3.1.1 Method**

##### *Participants*

Ninety native German speakers (age range=18-75) participated in the experiment. Non-native German speakers and subjects who exceeded or undercut the set time limit of rating the sentences were excluded from the experiment. A pre-test was conducted in preparation for the study in which four participants were asked to decide if the instructions were clear and if the sentences sounded natural. None of the participants that took part in the pre-test participated in the study. The participation was voluntary and anonymous, and participants did not receive remuneration.

*Material*

The experiment, including the test items, instructions, and sample sentences, was conducted in German and followed a univariate, with-item and with-subject design. The independent variable was sentence type, with the four levels representing sentences containing a name-informing quotation (NIQ) with a determiner (*DetNIQ*), without a determiner (*noDetNIQ*), a denotation (*Denotation*), and a title (*Title*). In total, each participant rated 48 sentences for the survey. All sentences presented in the study shared the characteristic of a comparable syntactic structure: whereas the context sentence was a complex sentence including a relative clause, the final sentence was a simple sentence involving a subject, the name-informing predicate, and a noun phrase. Overall, the experiment comprised four conditions with I. and II. constituting the critical items, while III. and IV. featured the control items.

- (15) I. Passanten beobachten, wie eine wasserbauliche Schutzanlage durch eine Erdmasse komplett zerstört wird. Man nennt dieses Versagen der Schutzvorrichtung einen Dammbbruch / einen „Dammbbruch”. [DetNIQ]  
*‘Passers-by watched how a wall designed to impound water was completely destroyed by a downstream. One calls this failure of the protective wall a dam burst / a “dam burst”.’*
- II. Der Architekt schlägt vor, auf das neue Haus ein Dach mit abgewinkelten Seiten zu setzen. Man nennt diese Konstruktion Satteldach / „Satteldach”. [noDetNIQ]  
*‘The architect suggests to use a roof with a hyperbolic paraboloid form for the new building. One calls this type of construction saddle roof / “saddle roof”.’*
- III. Die Schulleitung gibt zu, die Noten der Lernenden aus der Jahrgangsstufe fünf und sechs vertauscht zu haben. Dieses unglückliche Versehen beklagt jedoch der Lehrer / der „Lehrer”. [Denotation]  
*‘The school administration admits having mixed up the exam results of the 5<sup>th</sup> and 6<sup>th</sup> graders. This unfortunate incident was complained about by the teacher / the “teacher”.’*

- IV. Der Leser mag die Idee, einen Elefanten in einer Riesenschlange in Form eines Hutes zu zeichnen. Diese Darstellung findet sich in Der kleine Prinz / „Der kleine Prinz”. [Title]

*‘The reader likes the idea of painting an elephant inside a giant snake in the shape of a hat. This illustration can be found in The Little Prince / “The Little Prince”.’*

In order to have a greater variety of name-informing constructions, in the critical conditions, the following three name-informing predicates were used: *nennen* (‘call’), *sich nennen* (‘call.refl’), and *bezeichnen als* (‘refer to as’). In the constructions in (16), the ‘N’ stands for the nominal compound, as it was included in the critical items:

- (16) a. Man nennt dieses X ein N.  
*‘One calls this X an N.’*  
 b. Dieses X nennt man ein N.  
*‘This X is called an N.’*  
 c. Dieses X nennt sich ein N.  
*‘This X is called an N.’*  
 d. Man bezeichnet dieses X als ein N.  
*‘One refers to this X as an N.’*  
 e. Dieses X bezeichnet man als ein N.  
*‘This X is referred to as an N.’*

All noun-noun compounds were tested for frequency in the corpus of the German language provided by the Leipzig Corpora Collection (LCC).<sup>8</sup> Compounds of a comparable frequency were chosen in order to ensure that the items are lexicalized to a similar degree (see, e.g., Schlechtweg 2018). Furthermore, in comparison to low-frequency classes, highly familiar expressions are more likely to lead to an ironic interpretation of the expression in quotes (Härtl 2018). As the experiment did not aim at a distancing interpretation of the quoted expression, a low-frequency class for each of the 24 compounds was chosen and balanced around a mean of about 17.6. The

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8 <https://www.wortschatz.uni-leipzig.de>

nominal compounds thus include only masculine and neuter nouns. The number of syllables of all compound nouns in the critical items ranged from three to four for each compound. Thus, the compounds provided in the study were exclusively endocentric compounds which have been argued to be referring (cf. Krifka et al. 1995; Bücking 2010) and therefore functioned as a name for a sub-concept of the compound's head.

In addition to the 24 critical items, a total of 24 control items were used, which contained no name-informing predicates at all. The control items were divided into two categories that were balanced with regard to the number of sentences: the first category of control items (III.) included proper names, such as the newspaper title *Der Spiegel* (lit. 'the Mirror'), whereas the second category (IV.) contained a noun phrase at the target position such as *der Lehrer* ('the teacher'). All sentences in the control condition ended with a noun phrase.

### *Procedure*

A forced-choice test format asked the participants to rate the appropriateness of quotes on a five-point Likert scale. The test items were presented and visualized with SoSci Survey (Leiner 2019). Concerning the overall structure of the survey, it is important to point out that four different versions were conducted. All items in the different versions were randomized to exclude possible order effects - the division into four questionnaires aimed at preventing a fatigue effect. The function of a random generator was used in SoSci Survey to ensure that participants were randomly assigned to one of the four questionnaires. Prior to the forced-choice test, two sample items were presented to the participants to familiarize them with the study design and the overall test procedure. These sample items were accompanied by instructions that provided a guideline on how to rate the items. In the next step, two further examples were presented to explain the test design. Then the participants had a training round with two practice items. They were asked to rate all sentences following their intuitions and without reflecting on the sentences. Participants could not use a going-back button since the study aimed at the first, spontaneous impression.

### **3.1.2 Analysis and results**

For the statistical analysis, the data from Raue (2020) were reanalyzed with the R

statistics software (R Core Team 2020).<sup>9</sup> The ordinal data were analyzed employing *clmm* (cumulative link mixed model) function from the *ordinal* package (Christensen 2019). The regression model used the level *DetNIQ* of the sentence type as the baseline for comparison (i.e., that other factor levels are compared against it), and the significance level was set with  $\alpha=0.05$ . The statistical analysis of the mean ratings is presented in Table 1. The formula of the converging model with the most complex random effect structure supported by the data is provided in the table.

Table 1. Cumulative Link Mixed Model fitted with the Laplace approximation

	Estimate	Std. error	z value	Pr(> z )
<i>noDetNIQ</i>	0.02991	0.21682	0.138	0.89 n.s.
<i>Title</i>	6.46035	0.61260	10.546	< 2e-16***
<i>Denotation</i>	-8.20524	1.23639	-6.636	3.21e-11***

**Formula:** RT ~ sentence type + (sentence type | subject) + (sentence type | item)

The ordinal model revealed no significant effect for *noDetNIQ* constructions, while the effect for the sentence types *Title* and *Denotation* was significant. We computed a post-hoc pairwise individual comparison analysis using the *Tukey* test to investigate the interaction between the four sentence types. The results showed a highly significant difference between the two control conditions, where higher ratings were obtained for items accompanied by quotes in the condition *Title* (mean rating=4.7) than in the condition *Denotation* (mean rating=1.0). The control items functioned as expected and are therefore consistent with the underlying assumption of the survey.

An additional post-hoc *Tukey* test was performed to compare the individual differences of the three sub-categories in both sentence types *DetNIQ* and *noDetNIQ*, i.e., the critical conditions tested for three name-informing predicates. The non-significant individual differences obtained in this post-hoc analysis are consistent with our prediction and imply that the name-informing predicates *nennen* ('call'), *sich nennen* ('call.refl'), and *bezeichnen als* ('refer to as') are used similarly in quotational constructions. Consequently, a variation in name-informing predicates did not influence the preference for using quotes with compound nouns.<sup>10</sup>

<sup>9</sup> Note that the difference in methodological approaches, i.e., the *ANOVA* Single Factor analysis presented in Raue (2020) and the herewith presented *Cumulative Link Mixed Model*, did not yield any statistical differences.

### 3.1.3 Discussion

The hypothesis, which predicted a preference for the quoted noun to be accompanied by a determiner in name-informing constructions, was not confirmed. We conclude that the presence of a determiner is not a predictor for the use of quotes in name-information constructions. Further, both critical conditions tended not to be accompanied by quotes in name-informing-constructions, which leads us to assume that there was no need to highlight the metalinguistic use of the name with quotes. Concerning the name-informing constructions of the critical items, the examination showed that there was no statistically significant difference between name-informing constructions involving the three different name-informing predicates *nennen* ('call'), *sich nennen* ('call.refl'), and *bezeichnen als* ('refer to as'), indicating a copula relation in all name-informing constructions. In other words, these predicates introduce a copula relation which leads to referring uses of the nominals. However, the study predicts that nominal compounds in name-informing constructions do not tend to be highlighted by quotes. This observation can be explained by the fact that the control items were too strong, concealing the difference in the conditions of interest. Thus, we assume that a difference between the use of constructions with and without a determiner is not detectable. These observations lead us to the question of whether name-informing constructions that are preceded by a determiner are equally acceptable to those without a determiner when looked at in isolation. To address this problem, an acceptability judgment experiment was conducted and is presented in the following section.

### 3.2 Study 2: Acceptability judgment study

We conducted a judgment study in German to test whether the acceptability of name-informing constructions with the verbs *nennen* ('call') and *bezeichnen als* ('refer to as') is modulated by the presence or absence of a determiner. Based on the results obtained in Study 1, we hypothesize that name-informing constructions involving a determiner are not judged to be less or more natural than name-informing constructions not involving a determiner. To gain a broader insight into this type of name-informing

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10 As predicted, there was no statistically significant difference between the four different test versions. Concerning the analysis of the control condition *Title*, which included newspaper titles, book titles, and titles for movies, the statistical analysis did not show a significant effect either.

construction, we will examine the two above-mentioned name-informing verbs for which we predict not to display a difference. We also predict there will not be an interaction between the two factors.

### 3.2.1 Method

#### *Participants*

Thirty-two participants (mean=31.8; sd=9.73) were recruited via *Prolific*.<sup>11</sup> They were adult, self-reported native speakers of German. They were naïve with respect to the purpose of the experiment.

#### *Material*

We constructed 24 sentence quadruplets according to a 2x2 design with determiner and verb as within-item and within-subject design. determiner was manipulated to represent two levels *+determiner* and *-determiner*, indicating the presence or absence of a determiner preceding the final compound noun. verb refers to the particular verb used in the name-informing construction, namely *nennen* ('call') or *bezeichnen als* ('refer to as'). Each critical item consisted of an adverbial phrase in the left periphery, followed by the verb manipulated as an independent variable, the impersonal subject *man* ('one'), then a demonstrative introducing a generic noun, and finally, an endocentric NN-compound that was controlled for frequency.<sup>12</sup> This final compound was or was not preceded by a determiner according to the experimental manipulation. An example item is given in (17).

- (17) a. Seit einigen Jahren nennt man dieses Möbelstück Bücherregal. [-determiner, nennen]  
*'For several years, this piece of furniture has been called bookshelf.'*
- b. Seit einigen Jahren nennt man dieses Möbelstück ein Bücherregal. [+determiner, nennen]  
*'For several years, this piece of furniture has been called a bookshelf.'*

<sup>11</sup> <https://www.prolific.co>

<sup>12</sup> All endocentric compounds used in this experiment had a frequency between 15-20 in the corpus of the German language provided by the Leipzig Corpora Collection.



- c. Seit einigen Jahren bezeichnet man dieses Möbelstück als Bücherregal. [-determiner, bezeichnen als]  
*'For several years, this piece of furniture has been referred to as bookshelf.'*
- d. Seit einigen Jahren bezeichnet man dieses Möbelstück als ein Bücherregal. [+determiner, bezeichnen als]  
*'For several years, this piece of furniture has been referred to as a bookshelf.'*

Items in each experiment were distributed across four lists according to the Latin square design and randomized within each trial. Participants saw a total of six items in each condition. In addition to the 24 critical items, 72 fillers were included.

### Procedure

A web-based acceptability judgment task was designed using PsychoPy 3 experiment creation application (Peirce et al. 2019) and Pavlovia<sup>13</sup> as the experiment hosting platform. The task had to be performed on a computer screen; smartphones were ruled out. All instructions and items were presented in German. Participants read and rated 96 sentences using a 7-point Likert scale ranging from 1 'very unnatural' to 7 'very natural'. They were also instructed that there is no "right" or "wrong" answer and asked to follow their intuitions. Participants received a compensation of £3.00 for their participation in this study,<sup>14</sup> which lasted approximately 20 minutes. Finally, before starting to judge the experimental items, every participant had a practice round with five sentences.

### 3.2.2 Analysis and results

All data presented in this experiment were analyzed using the R statistics software (R Core Team 2020). The judgment data were analyzed using an ordinal logistic regression with the *clmm* function from the *ordinal* package (Christensen 2019) to test for significant effects. Firstly, experimental factors and interactions were entered as fixed effects, as well as random effects for items and subjects with maximal random slopes.

<sup>13</sup> <https://pavlovia.org>

<sup>14</sup> The experimental material of this study was presented as fillers to a separate experiment conducted by Álvaro Cortés Rodríguez at the University of Tübingen which was partially funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – Project-ID 75650358 – SFB 833.

We report here the model with the best maximal random effect structure supported by the data, which was selected using a backward model selection process. The corresponding formulas are also included in the tables showing the statistical analysis.

Figure 1 shows the obtained mean acceptability ratings, and the corresponding statistical analysis is given in Table 2. Neither factor yielded a significant effect, and the interaction between the factors was also non-significant.

Table 2. Cumulative Link Mixed Model fitted with the Laplace approximation

	Estimate	Std. error	z value	Pr(> z )
determiner	-0.17149	0.16011	-1.071	0.284 n.s.
verb	0.12197	0.17945	0.680	0.497 n.s.
determiner:verb	0.01932	0.35602	0.054	0.957 n.s.

**Formula:**  $RT \sim \text{determiner} * \text{verb} + (\text{determiner} * \text{verb} \mid \text{item}) + (\text{determiner} * \text{verb} \mid \text{subject})$

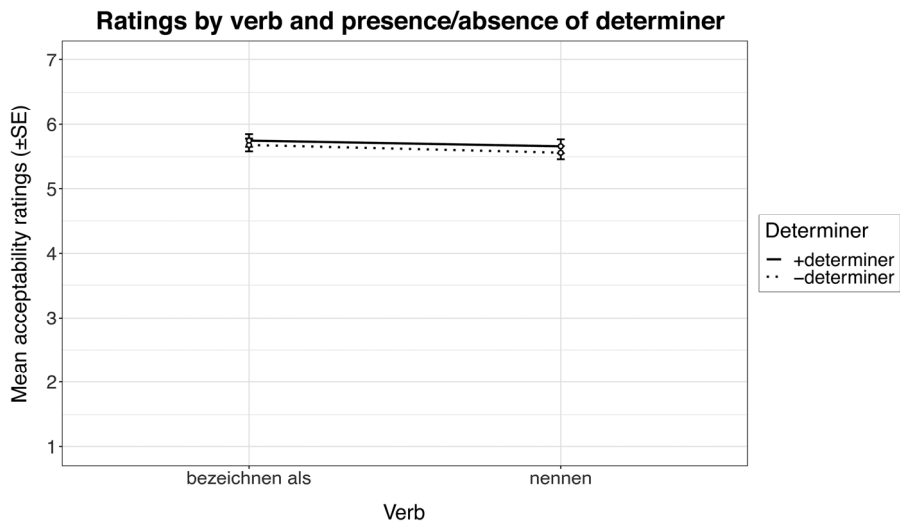


Figure 1. Mean acceptability judgments (n=32)

### 3.2.3 Discussion

The results of the acceptability judgment study showed no significant difference between the investigated factors. Name-informing constructions with and without a determiner are judged to be equally natural. Furthermore, no interaction between verb type and determiner use was observed. These results give rise to the conclusion that both uses of the name-informing construction are perceived as acceptable to an identical extent, at least concerning the evaluation of their interpretation.

It is important to mention that one of the reviewers raised the question of whether those null results could be due to an inadequate method selection. We would like to defend the use of this method on the bases that in a replication study in English using the same acceptability judgment method the results did indeed yield significant results (Raue and Cortés Rodríguez 2022). This study also included a 2x2 design with determiner and verb as independent variables (the latter comprising the verbs *call* and *refer to as*). The results of the experiment (N=27) showed a main effect ( $p < .001$ ) for the factor determiner, whereby conditions containing a determiner received significantly higher ratings. Hence, we can reason that this type of method can indeed capture the differences in NIC caused by the presence of a determiner.

An alternative explanation might be that the differences between the two uses are too subtle and are concealed in an offline reading task. Thus, participants may not have focused enough on the determiner as functional words tend to be skipped (Carpenter and Just 1983). Based on this, we decided to conduct a self-paced reading study to discard the possibility that the null difference observed for the referring and metalinguistic uses of name-informing quotations is due to the nature of the study. Thus, the granularity that an online study provides will serve to measure potential differences in real-time processing.

### 3.3 Study 3: Self-paced reading study

We conducted a self-paced reading-time experiment to investigate the latencies for anaphoric resolution of nominal expressions introduced by name-informing constructions. Since our research question was whether nominals accompanied by a determiner are referentially more salient, and thus, the copula is only materialized when a determiner

is included in an expression, our aim in this study was to find out if there were actual differences in latencies of trials with and without a determiner. Such a difference in referentiality should be reflected in the reading times as well. After the observations made in Study 1 and Study 2, we assume the null hypothesis again, i.e., no reading-time differences are expected between name-informing constructions involving a determiner and those not involving one. If, on the other hand, there are semantic differences between the two uses with and without a determiner, we would expect constructions with a determiner to be processed faster because the nominal receives a higher salience induced by the determiner and thus, can be accessed more easily. However, the results of Study 1 and Study 2 lead us to hypothesize that no major differences are caused by the presence or absence of a determiner.

### 3.3.1 Method

#### *Participants*

Thirty-two undergraduate students (mean age=22.2; sd=2.91) from the University of Kassel, Germany, participated in the experiment and received course credit for participation. They were all native speakers of German and had normal or corrected to normal vision.

#### *Material*

The material included 96 experimental items, out of which 24 were critical items and 72 were fillers. All items were in German and consisted of a set of sentences as well as a subsequent content question. An example of a critical item is given in (18) below. We adopted a 2x2 within-item and within-subject design with the independent variables being anaphora type and determiner. Anaphora type refers to the target sentences that either contained a *demonstrative* or a *pronoun* referring back to the nominal mentioned in the context sentence. The variable determiner denotes the presence of a determiner (+*determiner*), which should imply a more referential use of the nominal or absence of one (-*determiner*), which would lead to a less referential and, thus, more metalinguistic use of the nominal expressions.

- (18) Das Frühstücksei war letztes Jahr in dieser Familie so beliebt, dass man ein besonderes Gefäß, das es vor dem Wegrollen sichert, benutzte. [Context]  
*'Last year, the breakfast egg was so popular in this family that one used a special container, which keeps it from rolling away.'*
- a. /Man /nennt /die Erfindung /einen Eierbecher. [+determiner]  
*'One calls this invention an egg cup.'*  
 Wochenlang /half /dieser /immer /auch /beim Frühstück. [Target  
*'For weeks, this always has helped at breakfast, too.'* (demonstrative)]
- b. /Man /nennt /die Erfindung /einen Eierbecher. [+determiner]  
*'One calls this invention an egg cup.'*  
 Wochenlang /half /er /immer /auch /beim Frühstück. [Target  
*'For weeks, it always has helped at breakfast, too.'* (pronoun)]
- c. /Man /nennt /die Erfindung /Eierbecher. [-determiner]  
*'One calls this invention egg cup.'*  
 Wochenlang /half /dieser /immer /auch /beim Frühstück. [Target  
*'For weeks, this always has helped at breakfast, too.'* (demonstrative)]
- d. /Man /nennt /die Erfindung /Eierbecher. [-determiner]  
*'One calls this invention egg cup.'*  
 Wochenlang /half /er /immer /auch /beim Frühstück. [Target  
*'For weeks, it always has helped at breakfast, too.'* (pronoun)]

The mentioned nominals were endocentric compounds, either noun-noun or verb-noun. They were checked and matched for frequency beforehand using the Leipzig Corpora Collection. The observed variable was the measured reading time of the separate items. All items had the same structure as can be seen in example (18) above: they began with a context sentence (“Context”), followed by a sentence introducing the compound (“Intro”), and completed with the target sentence containing a demonstrative or pronoun which specifically referred to the nominal presented before. Example (18) shows the four possible conditions (a-d) in the “Intro” sentence as well as the subsequent “Target” sentences. To avoid ambiguities, items were composed in such a way that the demonstrative or pronoun in the “Target” sentence matched only the gender of the endocentric compound mentioned before.<sup>15</sup> All versions were counterbalanced across four

15 It is worth noting, that in the conditions +*determiner*, namely conditions “a” and “b”, the determiner was presented together with the noun. This paradigm was selected to maintain a parallelism in the segmentation across all conditions. NICs with and without a determiner are analyzed as unitary constituents, thus in order

lists so that each participant was presented with only one type of sentence, adding to a total of four sentences per condition. The items were randomized and presented along with 52 additional filler sentences. Participants were asked a comprehension question about the preceding sentence after every trial. Half of the comprehension questions required a ‘yes,’ and half required a ‘no’ answer. In order to prevent participants from creating a strategy to answer questions and therefore stop reading the items thoroughly at some point, questions were constructed to ask for information that could be conveyed by every constituent of the experimental item.

### *Procedure*

Participants were invited to come to the language lab on campus to complete the experiment. They were seated in front of a computer and received instructions in German before beginning the study. Subjects were asked to read sentences at their own speed and click through the segments and items.

The experiment was conducted employing E-Prime 3.0 software (Psychology Software Tools, Pittsburgh, PA 2016). Sentences were presented in segments and by means of a self-paced reading method with a moving window technique (Just et al. 1982). Each new trial started with a fixation asterisk which appeared in the center of the screen. After this, the stimulus appeared. First, the context sentence was presented in a single chunk. The introductory as well as the target sentence were both segmented and had to be revealed segment per segment by the participants by pressing the space bar. After each trial, they were given a comprehension question about the item that they had to answer with yes or no. The experimental items were preceded by three test items with the same structure. These were presented to the participants for practice. The whole experiment lasted approximately 30 minutes.

### **3.3.2 Analysis and results**

To start with, we analyzed the responses to the comprehension questions to exclude participants who did not read the items thoroughly. Only the data of participants who answered 75% or more of the questions correctly were included for further analysis. No

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to test whether one is more referential than the other, the distance (in segment number) to its anaphoric resolution has been kept identical.

participants were excluded after this treatment. Subsequently, all data points diverging 2.5 standard deviations from the mean per segment and participant were set to be removed; however, this did not lead to any additional data loss.

The data were analyzed using the R statistics software by means of a linear mixed-effects model using the *lmer* function of the *lme4* package (Bates, Mächler, Bolker, and Walker, 2015). All reading times were log-transformed before performing the statistical models. The experimental factors and the interaction were entered into the model. The model included random slopes for items and participants; we report here the maximal random effect structure supported by the data which was obtained using the *step* function of the *lmerTest* package (Kuznetsova et al. 2017). The corresponding formulas are also included in the tables showing the statistical analysis.

The descriptive reading times for the critical region, given in Figure 2 below, show no significant effects, neither anaphora type nor determiner factors. The full model summary is given in Table 3. The interaction of the factors did not approach significance. Figure 2 also displays the descriptive mean reading times for the spill-over region showing that conditions with a determiner to be read faster. As the full model summary for the first spill-over region given in Table 4 shows, there were no main effects for anaphora type or determiner. The interaction did not yield significant either.

Table 3. LMEM of reading time in critical region fit by maximum likelihood

	Estimate	Std. error	df	t value	Pr(> t )
(Intercept)	5.78	0.0547	30.0779	105.541	
anaphora type	-0.0076	0.0239	499.5807	-0.32	0.749 n.s.
determiner	-0.0217	0.0239	497.1242	-0.908	0.365 n.s.
anaphora type: determiner	0.0377	0.0479	500.1225	0.787	0.431 n.s.

**Formula:**  $\log(\text{RT}) \sim \text{anaphora type} * \text{determiner} + (1 | \text{item}) + (1 | \text{subject})$

Table 4. LMEM of reading time in spill-over region fit by maximum likelihood

	Estimate	Std. error	df	t value	Pr(> t )
(Intercept)	5.806e+00	5.413e-02	2.833e+01	107.264	
anaphora type	9.906e-04	2.589e-02	5.019e+02	0.38	0.969 n.s.
determiner	-4.238e-02	2.590e-02	4.983e+02	-1.636	0.102 n.s.
anaphora type: determiner	-4.614e-02	5.191e-02	5.026e+02	-0.889	0.375 n.s.

**Formula:**  $\log(\text{RT}) \sim \text{anaphora type} * \text{determiner} + (1 | \text{item}) + (1 | \text{subject})$

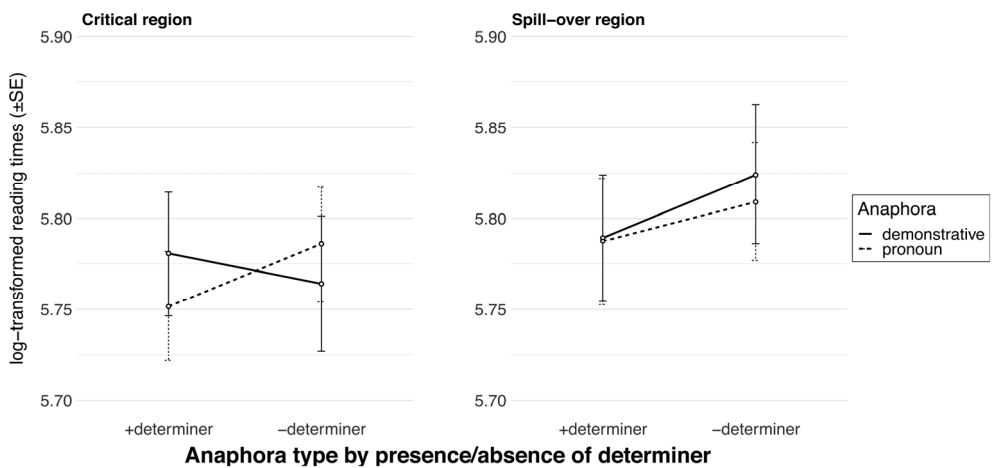


Figure 2. Mean reading times on critical region over item and subject (n=27)

### 3.2.3 Discussion

The results of Study 3 lead us to reject the alternative hypothesis and accept the null hypothesis. Based on reading time latencies for anaphoric resolution, we conclude that name-informing constructions containing a determiner are not referentially more salient than those without a determiner. At this moment, we cannot exclude that the semantic difference between the two uses is too subtle to be reflected in processing costs. The null difference in our data might also be explained by the ability of the discourse processing system to accommodate a referring interpretation even for name-informing constructions without a determiner and to aptly bind the anaphora to the mentioned



expression. As these conjectures, however, go beyond the scope of this paper, we leave them to future research.

#### **4. Conclusion**

This paper investigated different instances of name-informing quotation from an experimental point of view. We started from the assumption that name-informing constructions involve an underspecified copular relation. The copula can introduce a referring nominal in name-informing constructions, which is manifested through a determiner. The current study aimed at answering the question of whether the name in name-informing constructions accompanied by a determiner is perceived as “more” referential as compared to uses not involving a determiner. In order to test this, three experimental studies were conducted. These involved the use of quotation marks, acceptability rating as well as anaphoric resolution as variables. None of the results of the studies point to differences in the behavioral treatment of the two alternatives. This leads us to accept the null hypothesis: Names used in name-informing constructions accompanied by a determiner do not differ referentially from uses not involving a determiner. Our data suggest that the two realizations of name-informing constructions, i.e., those involving a determiner and those not involving a determiner, are semantically identical and entail identical semantic properties. The alternative hypothesis is not supported by our data. At the moment, however, we cannot exclude the possibility that the experimental methods we employed are not responsive enough to detect behavioral differences between the two uses. Given the semantic-pragmatic complexity of the construction in question, referential differences between the two uses may be too subtle and thus concealed in the experimental tasks we used. Therefore, further research employing alternative techniques allowing for fine-grained semantic features is required to confirm our conclusion.

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