

Some Philosophical Distinctions: Types vs. Tokens Use vs. Mention Numbers vs. Numerals Sentences vs. Propositions

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1. Types and Tokens

How many words are there in this paragraph? Well, it depends on what you mean. The question is actually ambiguous between the following two different questions. (1) How many different (unique) words are used in this paragraph? (2) How long is this paragraph in words, or how many *word occurrences* are there in this paragraph? The answer to the first question is: 46. On the other hand, the answer to the second question is: 93. For example, the word ‘the’ appears 11 times; which is to say that there are 11 *occurrences* of the word ‘the’ in this paragraph.

Another way of describing this is to say that there are eleven *tokens* of the *type* ‘the’. The original question then is ambiguous between.

- (1) how many word *types* are used in the paragraph?
- (2) how many word *tokens* appear in the paragraph?

Consider the following analogy. Suppose you are fishing, but you do it purely for sport, so that every time you catch a fish you promptly throw it back into the water. What if someone asks you

how many fish did you catch today?

Given your fishing technique, this is ambiguous! Suppose the fish are sufficiently indistinguishable to you that you can’t tell them apart. In other words, when you catch fish#2, you don’t know whether it is, or is not, the same fish as fish#1! Have you caught two different fish, or have you caught the same (stupid) fish twice?¹ The most you are entitled to say is

there were two *occurrences* of fish-catching

[[Exercise: sometimes, there are newspaper reports such as the following: “500 million Americans flew on airplanes this year.” What is wrong with this picture?]]

2. Sentences

A sentence is a sequence of words. Notice of course that, just as we need to distinguish word-tokens from word-types, we must similarly distinguish sentence-tokens from sentence-types. For example, the following list consists of two sentence-tokens of the very same sentence-type.

snow is white
snow is white

Although every sentence is a string of words, the converse is not true. Not every string of words is a sentence. The scientific discipline known as grammar (a branch of linguistics) is given the duty of explaining and describing which strings of words are sentences and which are not.

¹ A similar situation occurs in Eugene Ionesco’s classic play *Rhinoceros* [URL:<http://www.rhinoplay.cjb.net/>] In this play, the character aptly named “The Logician” gets into a frenzy trying to explain how to figure out how many rhinos they have in fact seen, as opposed to how many rhino-sightings there have been. It can be quite amusing, especially in the hands of an actor willing to go “over the top”.

3. Kinds of Sentences

Next, the word ‘sentence’ covers a wide range of expressions including:

declarative sentences	it is raining
interrogative sentences	is it raining?
imperative sentences	rain, rain, go away
exclamatory sentences	#%\$@!!! (maybe because it <i>is</i> raining)
performative sentences	let there be rain (an act unavailable to most beings)

Declarative sentences are unique in that they are *capable* of being true or false. For this reason, they are especially important to philosophy. For this reason, the others kinds of sentences are often simply ignored, and the term ‘sentence’ is used simply to mean ‘declarative sentence’.

4. Use versus Mention

If we are going to talk about words and sentences, we need a systematic scheme for doing so. To begin with, in order to talk about *any* domain of objects, we need *names* for those objects. This is based on the following principle.

Use-Mention Principle

In order to **mention** an object, one **uses** a word or phrase that refers to that object, or more simply, one **uses** a **name** of that object.

For example, in order to *mention* president Bush, we *use* his name; and in order to *mention* the planet we live on, we *use* its name.

Observe that, if we follow the above prescribed use-mention custom, then the colloquial expression

I thought I heard my name *mentioned*

is technically incorrect, most of the time at least. The logically proper reply might be

actually, you heard your name *used*!

Of course, it might very well be the case that you did hear your name *mentioned*; for example, the persons involved were discussing how to spell your name.

5. Numerals versus Numbers

Although ordinary language is very lax in its usage, there is a crucial difference between numbers and numerals, as they are technically understood. This is summarized in the following ideas.

Numbers are concepts (or abstract objects);
numerals are symbols.

The connection between numbers and numerals, and more generally numerical expressions, is quite straightforward, and is fundamental to understanding arithmetic. Arithmetic is the “science of counting”; more specifically, it is a mathematical theory of (about) the natural numbers (0, 1, 2, ...) In particular, arithmetic *uses* names of the various numbers to *mention* them. These names are numerals, which include the atomic numerals, and the molecular numerals. Combining these ideas with the use-mention concept can be summarized in the following principle.

Numerals are names of numbers;
we *use* numerals to *mention* numbers.

Now, there is exactly one system of natural numbers (supposing mathematical realism). On the other hand, there are many quite distinct numeral systems, including Egyptian, Babylonian, Mayan, Hebrew, Greek, Roman, Arabic², etc. Furthermore, within the Arabic numeral system, currently adopted by most of the world, there are many numeral *subsystems*. – decimal, binary, octal, hexadecimal, etc.

Once we are clear about numbers versus numerals, we can immediately see that the following colloquial expressions are fallacious; in particular, they commit the error of *use-mention confusion*.

10 is a round number
100 is a round number
etc.

10 is a double-digit number (so 10% inflation is double-digit inflation)
100,000 is a six-figure number (so an income of \$100,000 is a six-figure income)

What makes a *number* round? That it ends with a zero? But the number 10 doesn't end with a zero; its name does. We might as well say that the number 10 is mono-syllabic. Similarly with ‘double-digit’ and ‘six-figure’. If we use the base-2 numeral system, then we almost always have “double-digit inflation”, and most of us have at least “six-figure incomes”.

In short, the above sentences are guilty of “linguistic voodoo” – ascribing a trait to an object based entirely on a feature of its name. The following are similar examples.

² The so-called “Arabic” numerals entered Europe in about 1200 A.D. (C.E.) from the Islamic World (Middle East, Northern Africa). However, it is generally acknowledged now that they entered the Islamic World (specifically Baghdad) from India, approximately 800 A.D. (C.E.). They are accordingly also referred to as the “Hindu-Arabic numerals”.

Otto is a round person;
 Ohio is a round state;
 New York, New Jersey, and New Mexico are all new states.

6. Names of Words

We know how to *mention* people, planets, and numbers. We *use* their names. But suppose we want to talk about words (including names and numerals)? What if I want to talk, not about Bush, but about his name? For example, I want to know how it is spelled, or how it is derived from earlier words (e.g., is it English? Irish? German? ...) Similarly, what if I want to talk about the Arabic numeral for the number seven; for example, I want to discuss its evolution (e.g., how did it *look* in 1200 A.D.?).

The general answer is given by the Use-Mention Principle; namely, in order to *mention* a thing – even if it is a name – you *use* its name. But what are the names of names; what are the names of numerals? More generally, what are the names of symbols and sequences of symbols?

1. The Italic Method

The most common technique in scholarly literature is to use italics³ to mark a word that is being mentioned rather than used. For example, dictionaries follow this custom, as in the following example gleaned from a number of dictionaries.

the word *theory* derives from the Latin word *theoria*, which derives from the Greek word *theoros* [θεορος] , which means *spectator*.

Most scholars follow this custom, even though it presents a number of logical difficulties. The first problem is that it logically precludes using italics for any other purpose in writing – for example for *emphasis*. The second problem is that the technique is difficult to apply to phrases without introducing syntactic ambiguity. The third problem is that it does not generalize very well in respect to the Use-Mention Principle.

2. The Single-Quote Method

For these reasons, most logicians have adopted a custom, according to which one takes the word or phrase in question and encloses it within a pair of single quotes, and *uses* the resulting expression to *mention* the original expression. This is an instance of the following general principle.

The Single-Quote Principle

If one has a linguistic expression ϵ , then if one encloses ϵ in single quotes, then the resulting linguistic expression is a name of ϵ .

To see how this works, let us consider the following sentences.

³ The word ‘italic’ is related to the word ‘Italian’, and both *basically* are adjectives related to Italy. The use of ‘italic’ to refer to slanted letters traces to a Renaissance Italian manner of writing script letters.

- | | | |
|-----|---------------------------|---------|
| (1) | Bush is a Republican | (true) |
| (2) | Bush is a 4-letter word | (false) |
| (3) | 'Bush' is a Republican | (false) |
| (4) | 'Bush' is a 4-letter word | (true) |

In (1) and (2), I am *using* Bush's name to mention Bush. On the other hand, in (3) and (4), I am not talking about the president (former or current); I am talking about his (last) name. In order to mention Bush's last name, I use *its* name, which is obtained by placing the word inside single quotes.

3. The Double-Quote Method

Single-quotation is the dominant method used by logicians to mark use-versus-mention. It is the technique I employ in these notes.

Note carefully, however, that many authors employ double-quotation instead. Furthermore, most programming languages (e.g., Basic, Pascal, C++) *prescribe* double-quotation as the one and only method for referring to strings of symbols.

Double-quotation is also used for direct-quotation (see §10 below) – i.e., for verbatim transcripts of what is said. This is occasionally used in journalism to quote people. It is also used in fiction to convey the actual words used by the characters. It is also used in (screen)plays to *direct* actors to say particular strings of words.

4. Raised-Eyebrow Quotes

Yet another use of double-quotation is for “raised-eyebrow” quotation [also called “snicker quotation” and “scare-quotation”] an example of which occurs in this very sentence! When we place an expression inside snicker-quotes, we are indeed *using* the expression, but we are also calling attention to it simultaneously. In this respect, snicker-quotation is no different from other forms of emphasis, including italic and bold-face. In many cases, but not all, the easiest paraphrase of snicker-quotation is ‘so-called’.

5. To Make Matters Worse!

Unfortunately, many sources (the print media and British authors) use single-quotes for raised-eyebrow quotation and for direct-quotation. Alas (*sigh!*), there simply is no single universal consistent quotation convention in English.

6. The Off-Set Method

Oftentimes – for example, in many of the numbered sentences above – we are not using a sentence but only mentioning it. This illustrates another very important linguistic convention.

A linguistic expression can be mentioned by setting it off typographically.
One off-set method is to set it on its own line(s).

Of course, context is exceedingly important! For example, the boxed expression directly above is *not* an instance of this technique. Sometimes a sentence is set off typographically, because it says something

important or interesting. This is analogous to italics, which can be used to display/mention a word – for example, the word *emphasize* – or to *emphasize* a word, as in the previous phrase.

7. Context is Critical!

Context is critical in deciding whether a word is being used or mentioned. For example, let us for a moment consider the following three *people*.

- (1) Bush
- (2) Gore
- (3) Nader

Here I am talking about people, not words.

On the other hand, let us now change the topic somewhat and instead consider the following three *words*.

- (1) Bush
- (2) Gore
- (3) Nader

Here I am talking about words, not people.

7. Elaborating on the Basic Single-Quote Scheme

Things can get trickier. How do we mention the name of a name? One way, of course, is to set it off in display form. For example, whereas the following are examples of ordinary names,

Bush
10
100

the following are examples of names of names.

‘Bush’
‘10’
‘100’

What are the names of these expressions? Applying the single-quote naming scheme, we take the expressions in question, and surround them with single quotes, thus producing the following.

‘‘Bush’’
‘‘10’’
‘‘100’’

Indeed, if we take our single-quote naming scheme to its logical conclusion, we can produce an infinite list of names, as follows.

Bush
 ‘Bush’
 “Bush”
 “‘Bush’”
 etc.

The first item names the president (current or former); after that, each item names the item above it in the list.

Unfortunately, as it turns out, the twice-quoted expression

“‘Bush’”

looks a lot like the double-quoted expression

“Bush”

so we have to be very careful reading such expressions.⁴

8. The Way Quotes are Predominantly Used by this Author

In order to make our own work consistent, precise, and rigorous, we must declare our own conventions. This is described as follows.

- (1) We use single-quotes for naming linguistic expressions.
We never use double-quotation for this; we never use italic for this.
- (2) We use italic for *emphasis*. [← an example!]
- (3) We use double-quotes for “raised-eyebrow” quotation. [← an example!]
We never use single-quotes for this.
- (4) We use double-quotes for direct-quotation, and to name concepts.

9. A Big Difference Between Single-Quotes and Double-Quotes

Having declared what quotation convention we are using, we next observe that there is a critical distinction between single quotes and double quotes, summarized as follows.

Single quotes are an integral part of the words they surround.

Double quotes are not an integral part of the words they surround;
rather, they are merely punctuation.

⁴ Of course, the computer binary/hex representation of the above strings is not ambiguous.

Let us elaborate on this. First, by punctuation, we mean those orthographic features of a sentence that are meant to organize and present it, including the usual punctuation symbols, plus capitalizing, boldfacing, italic, etc.

Internet Email gives us an example of punctuation not discussed by traditional grammar books – enclosing a word between asterisks – as in the following.

word

We can treat our use of double-quotation the same way. The critical fact is that asterisk-symbols – or double-quotes – flanking a word are not an integral part of the word, but part of the surrounding punctuation.

The following syntactic principle clarifies the notion of integral part.

When one flanks a word with single-quotes, the resulting expression is a new, longer, word. More generally, when one flanks a string of symbols/characters with single-quotes, the result is a proper noun of expanded English.

For example, the following is an *infinite* list of *distinct* words in (expanded) English.

Bush
 ‘Bush’
 ‘‘Bush’’
 ‘‘‘Bush’’’
 ‘‘‘‘Bush’’’’
 etc.

Notice that each such word names the word above it – except the first, which names the (former) U.S. president. Notice also that each word is two symbols longer than the previous word, so that the following are true sentences.

‘Bush’ is a 4-letter word;
 ‘‘Bush’’ is a 6-letter word;
 ‘‘‘Bush’’’ is an 8-letter word;
 etc.

Here, we understand that spelling in the sophisticated and expanded language *must* include reference to single-quotes.

Single-quotation produces a new word every time it is applied. What about double-quotation? The corresponding principle is the following.

Flanking a word with double-quotes does not produce a new word, but is rather a special manner of presenting/displaying/using that word (not different in nature from bold-facing, italicizing, asterisk-flanking, etc.)

10. Other Examples of Use-Mention

1. My name is ____

Generally, we do not get into trouble when we confuse use and mention. Consider the following perfectly acceptable bit of English.

the president's name is George Bush

This seems perfectly understandable. However, suppose we combine this with the following identity statement.

George Bush is the president

Then we can use Identity Logic to obtain the following logical consequence.

the president's name is the president

A valid argument has led to a false conclusion, so one of the premises must be false. The culprit is the first one. We understand it in a way that makes it true, but technically speaking it is false. The correct formulation of this statement is

the president's name is 'George Bush'

Interestingly enough, identity logic also provides the following conclusion.

George Bush's name is 'George Bush'

Indeed, we have here an instance of a general form⁵, which includes many instances, including the following.

Bill Clinton's name is 'Bill Clinton';

Al Gore's name is 'Al Gore';

Ross Perot's name is 'Ross Perot'.

2. I am called ____

There is an intimate connection between the expression

my name is ____

and

I am called ____

Accordingly, the same use-mention rules apply. What you are called is a name, so the appropriate sentence then is:

I am called 'Dubya'

not:

I am called Dubya.

⁵ As it turns out, the general form of these sentences is difficult to write down.

3. My name is called ____

Answer the following questions by completing the sentence.

- (1) the president is ____
- (2) the president is called ____
- (3) the president's name is ____
- (4) the president's name is called ____

For a whimsical and maddening portrayal of the problem of names and *their* names, see Chapter 8 of *Through the Looking Glass* (the sequel to *Alice in Wonderland*) by the logician-humorist Lewis Carroll.⁶

4. ____ is so-called because ____

We conclude this discussion by considering the puzzling situation in which the same word is simultaneously *used* and *mentioned*, as in the following example. Suppose we wonder whether

Goliath was so called because of his size.⁷

What does the 'so called' refer to; not to the man Goliath, but to his name. So we are talking both about Goliath and the name 'Goliath'. If we dispense with the pronoun-like expression 'so', we have the following paraphrase.

Goliath was called 'Goliath' because of his size.

11. Direct-Quotation versus Indirect Quotation

As mentioned earlier, double-quotes are often used for *direct quotation*, which is distinguished from *indirect quotation*. Suppose I tell you that I witnessed an exchange between the notorious politicians Smith and Jones (fictitious names!). You might ask me what each of them said. This question is actually ambiguous. Do you want me to convey to you the *verbatim* transcript of the conversation, or do you want me to convey to you the *content* of the conversation? If a verbatim transcript is requested, then I must use *direct*-quotation. On the other hand, if the content is requested, then I must use *indirect*-quotation. The following is an example of direct-quotation.

First, Smith said to Jones, "you are an idiot!"

To this Jones quickly replied, "you are an idiot, and so is everyone who voted for you!"

The following is a corresponding example using indirect-quotation.

First, Smith said to Jones **that** he is an idiot, to which Jones said to Smith **that** she is an idiot, and so is everyone who voted for her.

What generally marks indirect-quotation is the word 'that', although it is occasionally dropped for the sake of conciseness (it can always be reinserted). We will be discussing this idea in greater detail shortly. But first, let us consider a few more examples.

⁶ URL:<http://www.literature.org/authors/carroll-lewis/through-the-looking-glass/chapter-08.html>

⁷ Good hypothesis, but it is in fact the other way around. 'Goliath' means 'giant' because the person Goliath was a giant. A joke that is related involves the following remark: "no wonder they're called 'pigs'!"

There is a well-known joke dating back at least to the *Three Stooges*. In one of their skits, Larry gets trapped under a big pile of stuff (I don't remember exactly what), and cries out for help. Unfortunately, his voice is muffled so badly that it is impossible to understand what he is saying. So Moe asks Curly, "what did he say? what did he say?" To this, Curly replies by exactly mimicking the sounds coming from Larry. And, of course, as a direct result of his impertinent reply, Curly gets bopped! Even low-brow humor can be founded on high-brow concepts (or maybe it's the other way around!)

Similarly, suppose you are a translator for former presidents Clinton and Yeltsin, who have gotten together to discuss "the good old days". If Clinton asks you "what did he say?", you are expected to repeat not Yeltsin's *words* but his *thoughts*. If you continue restating everything in Russian, you will get bopped just like Curly!

Note, however, that the technique of formal diplomatic translation is something in between direct and indirect quotation. In particular, one tries to use words that are pragmatically similar to the original words, so that Yeltsin might actually have used those very words *were he* to speak in English. So if Yeltsin says 'my country' (but in Russian!), the translator must also say 'my country' (now in English!), and definitely not '*his* country'. The idea, I think, is that an official translator (*qua* official translator) is supposed to be a "transparent linguistic facilitator".

Of course, this official facilitating role can be momentarily suspended. Suppose Yeltsin makes an off-the-record remark to his aid, which you and Clinton overhear, but Clinton doesn't understand. Clinton might ask *informally* 'what did he say?' Your role as transparent linguistic facilitator is momentarily suspended, and you are allowed to speak naturally; in particular, you are allowed to use genuine indirect quotation. For example, you might say "President Yeltsin said *that he* has a terrible hangover."

12. Grammatical Analysis of Quotation Statements

Before we continue, it is useful to perform a bit of grammatical analysis. Suppose you are asked to report the interchange between Smith and Jones. As previously noted, you have a choice between using direct-quotation and indirect-quotation. For example, you could report as follows.

direct-quotation: Jones said "Smith is a big spender";
 indirect-quotation: Jones said *that* Smith is a big spender.

Let us grammatically analyze these two sentences.

Jones	said	"Smith is a big spender"
subject	transitive verb	direct object
noun phrase	2-place predicate	noun phrase

Jones	said	that Smith is a big spender
subject	transitive verb	direct object
noun phrase	2-place predicate	noun phrase

Notice in particular that, in each case, the direct object of the verb is a complex noun phrase, which accordingly names something – but what?

13. Sentences versus Propositions

The distinction between direct-quotation and indirect-quotation brings us to a heavy-duty distinction in philosophy – between *sentences* and *propositions*.

First, the basic idea is this. In reporting via direct-quotation, we name the *sentence* actually used by the person, but in reporting via indirect-quotation we name the *proposition* asserted by the person. So in the previous example,

“Smith is a big spender” is the actual **sentence** used by Jones,
and
that-Smith-is-a-big-spender is the **proposition** asserted by Jones.

Without trying to get too involved here, let us simply examine the *prima facie* differences between sentences and what they say (propositions).

First of all, sentences are linguistic objects, like words. They consist of sequences of sound-types (spoken language) or sequences of symbols (written language). A sentence must be carefully distinguished from *what the sentence means*, or *what the sentence says* (when it is uttered). These sorts of things are variously called “statements” and “propositions”. We will simply use the term ‘proposition’.

Now, the difference between the five letter word ‘water’ in English and the liquid substance it denotes should be obvious enough, and no one is apt to confuse the word and the substance. Similarly no one is apt to confuse the four letter word ‘Bush’ with the (former or current) president. Whereas ‘water’ and ‘Bush’ consist of letters, water and Bush consist of molecules. The distinction between a sentence and the proposition it expresses is just as extreme as the distinction between the word ‘water’ and the substance water. This is summarized in the following simple table.

words and phrases	denote	objects (broadly understood)
the word ‘Bush’	names	the person Bush
the sentence ‘Bush is a Republican’	says	the proposition that-Bush-is-a-Republican

There is another important difference between sentences and propositions. Whereas sentences are always part of a particular language (e.g., English), propositions are not peculiar to any particular language in which they might be expressed. Thus, for example, the following are different sentences in different languages, yet they all express the same proposition.

it is raining
es regnet
il pleut

We do not have to consider distinct languages to have examples of different sentences saying the same thing. Recall our two politicians. Suppose Smith says *to* Jones “you are a pig”, to which Jones says “I am a pig?” Two different sentences have been used to express the same proposition. There is another difference in these two sentences – whereas, Smith *asserts* the proposition, Jones *questions* the proposition.

There is a flip side – the same sentence can be used (in different contexts) to express different propositions. For example, the sentence ‘I am hungry’ expresses a different proposition for each person who utters it. When I utter it, the proposition concerns *my* stomach; when you utter it, the proposition concerns *your* stomach; when the Queen of England utters it, the proposition concerns *her* stomach.

Just as importantly perhaps, the same person can use the same sentence ‘I am hungry’ on different occasions to express different propositions. This is true because, presumably, we mean ‘I am hungry *now*’, and each occasion of utterance involves a different time.

We can even use the *same physical token* on different occasions to express different propositions. This is very common in the modern world, although we take it for granted. Consider a message on an answering machine

“I am not home *now*, so please a message.”

When we first record such a message, we are lying – afterall, we *are* home when we do the recording! Perhaps this humorous observation⁸ misunderstands the point of recording a message. We are not actually speaking in “assertive mode”. Rather, we are simply recording a sentence *token* that can later be used on various occasions to make assertions and give directions. On those occasions, of course, you may in fact be lying! Afterall, you are home, but you don’t want to answer the phone.

Recording a message into an answering machine is no different from recording (i.e., writing) the message “I’ll be back” on a card, to be used repeatedly on one’s door. And neither of these recording-acts is interestingly different from simply buying a pre-written placard that says “CLOSED” on one side and “OPEN” on the other side. We have two sentence tokens. In either case, the same token can be used over and over again, and on each occasion it expresses a different proposition.

⁸ It sounds like something the comedian Steven Wright might say.