

# Let's Come Somewhere Else

## The Semantics of “Come” and “Go” in English

Tyler I. Cecil  
University of Washington, Ling 578

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### Abstract

COME and GO are often thought to encode ingress and egress relative to the speaker. In truth, this is a gross simplification of how those words are used. Sentences like “I’m coming over to your house” demonstrate that the speaker often takes the point of view of the hearer when using COME. In this paper we introduce a formal model for the semantics of these two verbs of motion. We begin with an overview of deixis, both in English as well as in general. Then we review seemingly problematic data associated with COME and GO. Although one may be tempted to use a psychological model of self-projection, we demonstrate a much simpler method based on what Fillmore calls *supposition rules*. The rules provided in this paper are a refinement of those originally introduced by Fillmore (1966).

## Deixis

A fundamental feature in language is our ability to “point out” — to connect our words to the world around us (Cairns 1991). Deixis (from the Greek δειξίς, ‘display, demonstration, or reference’) is the name for the universal faculty of language to refer to the world in context. Deictic expressions, such as THIS or THAT, are the linguistic equivalents to (and often accompanied by) physical pointing. This is highly related to *anaphora*, words which refer back (or forward) to other phrases in a dialogue. They may even be the same phenomena, in an abstract sense.

A word is deictic if its semantic meaning is fixed, but its denotation depends on the context. A clear examples are the 1st and 2nd person pronouns.

- (1) a. *I see you.*
- b. SEE(I, you)
- c. SEE( $\hat{C}$  [+SPEAKER],  $\hat{C}$  [+HEARER])

Without a theory of deixis, we would have to stop at (1-b) and consider “I” and “you” as constants (which they clearly are not). So we go further, and introduce some notion of a context. We are left with (1-c), the *semantic* meaning of “I see you”. If we want to understand

its denotational meaning, we need to apply some specific context,  $\mathcal{C}$ .

$$\begin{aligned} \left[ \begin{array}{l} \overset{\mathcal{C}}{+\text{SPEAKER}} \rightarrow x \\ +\text{LISTENER} \rightarrow y \end{array} \right] &\models \text{SEE}(\mathcal{C} [+ \text{SPEAKER}], \mathcal{C} [+ \text{HEARER}]) \\ &\models \text{SEE}(x, y) \end{aligned}$$

A remark on notation: I am using  $\mathcal{C}$  here as a kind of “collection”. We could expand  $P(\mathcal{C} [+ \text{CLASS}])$  into  $[\exists x : \text{CLASS}(x, \mathcal{C})]P(x)$ . Further, I am using  $\hat{\mathcal{C}}$  to denote a not-yet-specified context. So  $P(\hat{\mathcal{C}} [+ \text{CLASS}])$  really looks more like  $\lambda\hat{\mathcal{C}}.P(\hat{\mathcal{C}} [+ \text{CLASS}])$ . Formalizing this further involves a large amount of symbolic bookkeeping (especially if one wants to capture semantic-compositionality). This simpler notation suffices to investigate COME and GO, but for a Montague-styl treatment on deixis and other indexicals, see Bennett (1978).

### What Is In A Context?

All deictic expressions have a *Deictic Center* — the time of, place of, and person speaking. As dialogue proceeds, the center shifts between interlocutors. The center encodes the difference specially, temporally, and even socially (as is the case with honorifics) between speaker, hearer, and other elements in the world.

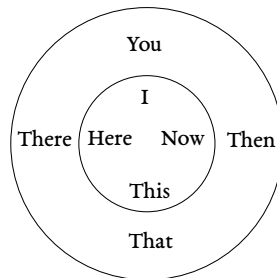


Figure 1: The “Deictic Center” anchors deictic expressions.

Naturally, deictic words don’t have just one single deictic label; there are a number of deictic “classes”<sup>1</sup>, to use the language of Fillmore (1966). Table 1, for example, shows how these classes are used by English pronouns.

The question then arises — what deictic categories are there? This is a difficult question to answer, as there is a lot of linguistic diversity to consider.

For example, in English, **HERE/THERE** and **THIS/THAT** form natural pairs. Those same categories in Japanese (and indeed many other languages) are actually triplets: **KOKO/SOKO/ASOKO** (for place) and **KORE/SORE/ASORE** (for things). Each is classified as **PROXIMAL** (near the speaker), **MEDIAL** (near the hearer), or **DISTAL**. English seems to have lost its **DISTAL** class (the Middle-English “yonder”), merging it with the **MEDIAL**. Still other languages go further, having four or more spacial classes — Inuktitut has claim to fourteen (Denny 1982)!

<sup>1</sup>Remember, in our notation a “class” in our system is a predicate relating elements with a context.

+PARTICIPANT				
+SPEAKER -HEARER		+SPEAKER +HEARER	-SPEAKER +HEARER	
Singular I	Plural WE (exclusive)	Plural WE (inclusive)	Singular YOU	Plural YOU

Table 1: Personal pronouns and their deictic classes.

There are even entire deictic categories absent in some languages. Honorifics and social deictic markers are common place in many languages, yet totally absent in others. Direction of motion is often captured (as is the case with the German HIN/HER prefixes), and equally often omitted.

The nature and structure of deictic context goes well beyond what we wish to tackle here. To understand COME and GO, we will only require a small set of classes.

## Come and Go

Often COME and GO are treated as being the same basic predicate (call it MOVE), but with additional deictic information — either ingress or egress relative to the speaker. We could describe this naïve interpretation more formally:

### Come and Go Rules (First Attempt)<sup>2</sup>

$$\begin{aligned} \|\text{come}\| &:= \text{MOVE}(\text{agent}, \text{goal}) \wedge \text{PROXIMAL}(\text{goal}, \hat{C} [+SPEAKER]) \\ \|\text{go}\| &:= \text{MOVE}(\text{agent}, \text{goal}) \wedge \neg \text{PROXIMAL}(\text{goal}, \hat{C} [+SPEAKER]) \end{aligned}$$

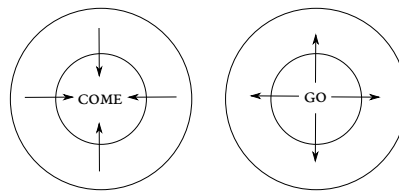


Figure 2: COME and GO are often described as deictic ingress or egress.

This model explains some simple judgments.

- (2) a. Come here!  
b. Go there!

<sup>2</sup>I am using PROXIMAL as a predicate on two elements, which differs from “C [+PROXIMAL]”, where it was used as a predicate on an element and context. They should be treated differently, and we need only note that PROXIMAL( $\hat{C} [+PROXIMAL]$ ,  $\hat{C} [+SPEAKER]$ ) is a tautology.

- c. #Go here!<sup>3</sup>
- d. #Come there!

The above rules, however, quickly fall short! Both of the following sentences are acceptable, despite (3-b) explicitly setting the goal of COME to the distal THERE!

- (3) a. I will come *here* again tonight.
- b. I will come *there* again tonight.

Replacing COME with GO, interestingly, yields a different result.

- (4) a. #I will go *here* again tonight.
- b. I will go *there* again tonight.

Obviously in order to explain this, a more complicated model is needed. First, it seems prudent to examine the data.

## Valid Contexts and Situations

There are a number of parameters that can be adjusted while trying to describe the true nature of COME and GO. Some of the most salient are:

- |  |   |
|--|---|
| 1. Person  | 3. Hearer Location (relative to both the source and goal) |
| 2. Speaker Location (relative to both the source and goal) | 4. Tense  |

For each combination of parameters, we want to see if COME or GO would be accepted. To make this concrete, set the goal as “New York”. Taking the first person, with the hearer at the goal (NY), speaker at the source, and in the present tense:

- (5) a. I am coming to New York.
- b. I am going to New York.

Both (perhaps surprisingly) are acceptable. “You are coming to New York”, however, would only be acceptable when the speaker is in New York.

Rather than describing each situation sentence by sentence, we can better show our data visually. Figure 3 highlights each situation where a sentence would be acceptable. As an example, the last diagram shows “she is coming to New York” must imply either the speaker or the hearer is in New York at the utterance time.

A few patterns show themselves rather quickly — neither COME nor GO are licenced when the agent/theme is already at the goal. Additionally, GO is never used when the speaker is at the goal, matching our initial intuitions. The situation with COME is obviously more complicated.

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<sup>3</sup>Actually, “Go here!” might make sense in a situation where HERE is referring to something other than the speaker’s location (for example, while pointing at a map).

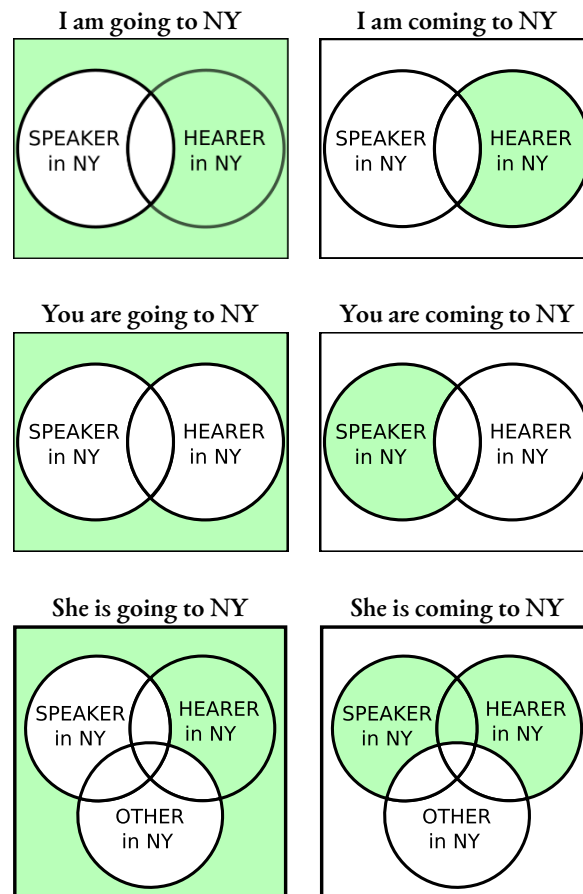


Figure 3: Valid usages of COME and GO in the present tense.

## Self-Projection and Deictic Shifting

In the case of *COME*, one way to explain our data wouldn't exactly require our rules to change. Instead, we note that the speaker can optionally take the viewpoint of the hearer. Almost as an act of empathy, they seem to project themselves into the hearer's position.

This isn't without basis. Neurological evidence seems to suggest that projection does occur as speakers both hear and use verbs of motion (de Vega et al. 2015). Another interesting source of evidence is that of autistic children, a group well known to have difficulty with deictic expressions. Hobson, García-Pérez, and Lee (2010) conducted research demonstrating idiomatic usages of *HERE*, *THERE*, *COME*, and *GO* in children with autism. It would perhaps be enlightening to explicitly test the self-projection associated with *COME* — if subjects don't agree with the judgments in Figure 3, it may suggest that there is indeed a kind of psychological act of empathy taking place with verbs of motion.

This explanation, however appealing, is not without problems, and likely insufficient for our formal analysis.

### The Issue of a Split Deictic-Center

If we were to model this formally, we might be tempted to simply “use the hearer’s context”. That is, when providing some context  $C$ , evaluate as if the hearer were the speaker, moving the deictic center. For “I am coming to New York”, we would have:

$$\text{MOVE}(\hat{C} [+SPEAKER], \text{NY}) \wedge \text{PROXIMAL}(\text{NY}, \hat{C} [+SPEAKER])$$

Now we have a new problem — the contexts used for “I” and “coming” don’t match! That is to say, one doesn’t suddenly switch to second-person when this deictic shift occurs! The problem is even more stark for the sentence “I am coming over there”.

<b>Speaker Context:</b>	I, THERE
<b>Hearer Context:</b>	COMING

Table 2: The sentence “I am coming over there” seems to contain two deictic centers, simultaneously

This problem can be overcome. For instance, we could stratify contexts, marking which instances of  $C$  may be overridden. The system developed later, however, is much more elegant.<sup>4</sup>

### The Issue of Cross-Linguistic Data

Cross-linguistic data also reveals something about the nature of this self-projection — namely that it is not universal!

- (6) a. Pātī ni kuru?  
party to *come*  
b. Un, pātī ni iku!  
yes party to *go*  
c. \*Un (watashi-wa) pātī ni kuru!  
yes (I-TOPIC) party to come

In Japanese, it is unacceptable to use the verb *KURU* (come) unless the verb describes ingress towards the speaker. This could be due to how contextual Japanese is — interchanging *COME* and *GO* might be confusing without explicit subjects.

I consider this to be an issue, as it is not obvious why one language would allow for a psychological point-of-view shift while another would not. More likely is that the words themselves carry different semantics. In fact, a paper by Wilkins and Hill (1995) examined

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<sup>4</sup>As an aside, other phenomena seem to cause this “multiple deictic centers” effect. While giving directions, words like *LEFT* and *RIGHT* project to where the hearer will be as they follow the directions, where as *HERE* and *THERE* stay rooted in the present. Pragmatics and psychology are at work here, and I don’t want to dismiss the self-projection model. The field of Deictic Fields and Narration studies how readers become immersed in a text, which may be essentially the same phenomena.

analogous verbs of motion in Mparntwe Arrente and Longgu (two unrelated Austronesian languages), and concluded that “come” and “go” are far from lexical universals — often these verbs carry their own idiomatic semantics.

So without further ado, let’s examine what those semantics might be.

## Supposition Rules

The semantics of COME and GO were first formalized by Fillmore (1966), who used the idea of what he called a “supposition rule”. We will use that word here, but really a “supposition” is just another logical form. A word’s semantic is simply the conjunction of all its supposition rules.

The base predicate for each verb is  $\text{MOVE}(\text{agent}, \text{goal})$ . We can then add the obvious supposition rule — movement cannot occur when  $\text{source} = \text{goal}$ .<sup>5</sup>

### Rule 1: (come & go)

$$\neg \text{PRESENT}(\text{agent}, \text{goal})$$

Now, examining the usages of GO in Figure 3, there seems to be only one additional stipulation: the speaker cannot be present at the goal.

### Rule 2: (go)

$$\neg \text{PRESENT}(\hat{C} [+ \text{SPEAKER}], \text{goal})$$

The rule for COME is a little trickier. With the data we’ve covered so far, we can infer that either speaker or hearer must be present at the goal (this matches the point-of-view intuitions).

### Rule 3: (come)

$$\text{PRESENT}(\hat{C} [+ \text{PARTICIPANT}], \text{goal})$$

## Adding Tense

What’s missing here is one last parameter we haven’t actually examined yet — tense! Tense seems to expand the “self-projection” intuition into the temporal domain. Unfortunately Venn Diagrams become untenable for large numbers of sets, so individual examples will need to suffice.

- (7) a. **P1:** I’ll be in New York this Christmas. I’m going to miss you!  
 b. **P2:** I’ll come/go to New York to see you!

In (7) we see a use of COME that works regardless of the locations of either participants at utterance time. Instead their locations at event time seems to be more salient.

- (8) a. **P1:** Did you hear about Yui? She came here last night!  
 b. **P2:** While we were out shopping?!

<sup>5</sup>Actually, Fillmore did not include this rule (not that he would disagree with it, it just was left unstated). By not including it, however, he needed rather complicated rules for “come” in the non-present tense.

In (8) we have an example where the location at event time is irrelevant, and the utterance time takes precedence. In the language of self-projection, this means the speaker can optional take the viewpoint of either speaker or hearer at either the current or event time.

- (9) a. While I was in New York a friend went to visit me.  
 b. #Last week Javier went here.

Finally, (9) shows that the constraint on go is specific to the event time.  
 Updating our rules for tense<sup>6</sup>:

**Rule 1: (come & go)**

$$\neg\text{PRESENT}(agent, goal)@(\hat{C} [+EVENT-TIME])$$

**Rule 2: (go)**

$$\neg\text{PRESENT}(\hat{C} [+SPEAKER], goal)@(\hat{C} [+EVENT-TIME])$$

**Rule 3: (come)**

$$\begin{aligned} &\text{PRESENT}(\hat{C} [+PARTICIPANT], goal)@(\hat{C} [+EVENT-TIME]) \\ &\vee \text{PRESENT}(\hat{C} [+PARTICIPANT], goal)@(\hat{C} [+SPEECH-TIME]) \end{aligned}$$

Together these form a (reasonably) complete picture of COME and GO.

## Parting Notes

We now have a much richer understand of our two verbs.

$$\begin{aligned} \|\text{go}\| &:= \text{MOVE}(agent, goal) \\ &\quad \wedge \neg\text{PRESENT}(agent, goal) \\ &\quad \wedge \neg\text{PRESENT}(\hat{C} [+SPEAKER], goal) \\ \|\text{come}\| &:= \text{MOVE}(agent, goal) \\ &\quad \wedge \neg\text{PRESENT}(agent, goal) \\ &\quad \wedge \left( \text{PRESENT}(\hat{C} [+PARTICIPANT], goal)@(\hat{C} [+EVENT-TIME]) \right. \\ &\quad \left. \vee \text{PRESENT}(\hat{C} [+PARTICIPANT], goal)@(\hat{C} [+SPEECH-TIME]) \right) \end{aligned}$$

Interestingly, these rules seem to match the behavior of BRING and TAKE! In fact, this is also true of the German equivalent verbs, perhaps indicating a natural lexical parity.

There still remain some open questions we've left undressed. One example is the "come with" effect.

<sup>6</sup>Now we're using @ as a higher-order predicate operator, relating a predicate with a point in time, producing a new predicate. Really  $P(x)@t$  should be written as  $@(P, t)(x)$ . Once again, though, this sloppier notation makes our analysis clearer. I will go even further, and omit time entirely when  $t = \hat{C} [+EVENT-TIME]$ .



- (10) a. **P1:** I'm going to the store!  
b. **P2:** Oh, I'll come with!

In this example, neither participant is present at the goal, yet COME was used. One explanation might be that the speaker is using some  $t > \mathcal{C} [+EVENT-TIME]$ , where the hearer has already arrived. Or perhaps the destination isn't the store, but the journey itself.

Further examination and comparison of other languages would also be an interesting pursuit. In German, the prefix pair HIN and HER supposedly mark direction of motion similar to COME and GO, yet sentences like “Ich komme auch *da*hin” are totally acceptable — a mismatch of KOMMEN and HIN!

Another curiosity of mine is if there exist languages with more verbs than simply COME and GO. Perhaps those that encode the difference between DISTAL  $\rightarrow$  PROXIMAL and MEDIAL  $\rightarrow$  PROXIMAL. For example, Japanese having a MEDIAL class could possibly be having an effect on IKU and KURU.

Of course there will always be more to investigate. In this paper, we introduced the notion of deixis, and questioned how it might be modeled formally. With our new model, we analyzed the verbs COME and GO, uncovering surprisingly complicated behaviors. Ultimately we developed an elegant model to capture their nature. Answers beget questions.

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