

Indexicals and Undindexicals

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1. INTRODUCTION

Consider these utterances, made in my office at the University of California, Riverside:

- (1) The bars near here are friendly.
- (2) The bars in this neighborhood are friendly.

(1) and (2) seem to say basically the same thing, and David Kaplan’s (1989) analysis of indexicals seems apt for seeing how they work.

Kaplan gives us a theory of expressions in contexts. A *context* is a quadruple of agent, location, time and world. (I’ll mostly ignore worlds.) *Contents* are propositions, or propositional contributions of an appropriate sort. A *character*, basically Kaplan’s candidate for the meaning of an indexical or a sentence or phrase that contains one, is a function from contexts to *contents*. That is, more or less, the character determines what the expression stands for, when used in a given context.

So, ‘here’, provides the location of the context. Then we get functions from worlds to sets of bars that are appropriately related to that location in the worlds. And then the sets of worlds in which those bars are friendly, the propositions that are the contents of (1) and (2).¹ Being in the same

¹ Actually, in Kaplan’s theory, sets of world-time pairs, where the time is the time of the context; I ignore this complication.

neighborhood is not quite the same as being near. But, as I said, (1) and (2) say about the same thing, and Kaplan’s account explains this.

Now consider

(3) The local bars are friendly.

(3) seems to say pretty much the same thing as (1) and (2), so one might suppose that ‘local’ should be treated as an indexical. But there seems to be an important difference in the way it works, which comes out when we consider more complex cases.

Consider:

(4) Wherever one is in Ireland, the bars near here are friendly.

(5) Wherever one is in Ireland, the bars in this neighborhood are friendly.

(6) Wherever one is in Ireland, the local bars are friendly.

These don’t say the same thing. (4) and (5) seem at best weird ways of saying that traveling around Ireland doesn’t have any effect on the level of friendliness of bars near my office in Riverside. But (6) seems a perfectly intelligible way of saying that wherever you are in Ireland, the bars near that places you find yourself will be friendly.

If we wanted to use Kaplan’s theory to squeeze something like this reading out of (4), we might try quantifying over contexts. Where l_c is the location in the context c , and $here(c)$ denotes the value of the character of “here” at c :

(7) If anyone is at a location l in Ireland, for each context c , such that $l = l_c$, the bars near $here(c)$ are friendly.

But Kaplan call such things as (7) “monsters,” and claims that English does not allow us to quantify over contexts in this way. The difficulty of getting reading (7) out of (4) is evidence that he is right, and similar remarks apply to (5).

What then of ‘local’? On a natural approach there is an implicit parameter for spatio-temporal locations associated with ‘local’, which the quantifier ‘whenever’ binds in (6). We are not quantifying over contexts, and so don’t have a monster.

Consider (8), again said in my office in Riverside:

(8) Whenever we are in Ireland, the local bars miss us.

In (8), the natural reading for ‘local’ is those that are in the vicinity of the utterance. Roughly, ‘local’ provides a relation between locations and sets of locations (or a larger location). In (6), in input location is provided by the quantifier ‘whenever’; it is the locations we are in while in Ireland. In (8) the input location is provided by the utterance itself; it is the location of the utterance.

In (8), I will suggest that we have an “indexical” use of ‘local’. That is, the argument for the relation provided by ‘local’ is provided by basic facts about the utterance. In (6), we have an “undindexical” use; the input is provided by the quantifier, not by the location of the utterance. Here I use “indexical” for the phenomenon for which Kaplan provides a theory, without assuming his theory.

In Kaplan’s theory, contexts do two things. First they model utterances, or potential utterances. The agent is required to be at the location at the time in the world, but doesn’t have to say anything. Second, they supply the inputs, the only ones allowed, for the relations or functions provided by the characters of the expressions. On my account of

indexicals, these two roles are separated, and the inputs may or may not be provided by the context.

On my account, “local” can be seen as an expression that has both indexical and undindexical uses. With indexical uses, as in (3), the starting location, the one that other locations must be near to count as “local,” is the location of the utterance. With undindexical uses, as in (6), the starting location is provided in other ways. In (6) it is provided by the quantifier “wherever.” It can also be supplied anaphorically, as in,

- (8) I’m going to be in Cushendale next week. The local bar is very friendly.

The difference between (4) and (5) on the one hand, and (6), on the other, is simply that for “here” and “this” the indexical use is the *default*, but this is not so with “local”.

My main aim, however, doesn’t concern ‘local,’ but the way that bringing utterances into a Kaplan-inspired theory allows us to be more flexible in the way we treat the standard indexicals. Further, cases like (3) and (4) aren’t ones that really make such flexibility useful. There are, however, other cases, involving standard indexicals, where it seems needed.

2. TEMPORAL INDEXICALS

YESTERDAY, TODAY, AND TOMORROW

Consider this common bit of advice,

- (9) Never put off until tomorrow what you can do today.²

Let’s suppose my mother told me this on March 5, 1949. If she had been using ‘tomorrow’ and ‘today’ indexically, her use of ‘today’ would have referred to March 5, 1949, and her use of ‘tomorrow’ would have referred to March 6. So she would have been giving me rather specific advice about those two days. But that would not have been her intention. Rather than referring to those two days, she would have meant to convey,

- (10) For all times t , do not put off until the day *after* t , what you can do on the day *of* t .

She wanted me to adopt a certain policy, not simply to stop procrastinating for one day.

The words ‘tomorrow’, ‘yesterday’, and ‘today’ are associated with partial functions from days to days:

$\mathcal{F}_{\text{Tom}}(d) = d'$ iff d' is the day after d ,

$\mathcal{F}_{\text{Yest}}(d) = d'$ iff d' is the day before d ,

$\mathcal{F}_{\text{Tod}}(d) = d'$ iff $d' = d$,

It’s pretty clear that $\mathcal{F}_{\text{Yest}}$ is a partial function, for there were no days until there was a sun and an earth. It seems quite likely that there will be an end of days, so \mathcal{F}_{Tom} is partial. Perhaps \mathcal{F}_{Tod} is total.

Once we have in hand the day on which an utterance occurs, we can determine what uses of ‘today’, ‘tomorrow’ and ‘yesterday’ designate. But two earlier steps are required. First, for each utterance of an expression,

² Or, for that matter, Mark Twain’s improvement, “Never put off until tomorrow what you can put off until the day after tomorrow.”

there is a *spatio-temporal location*, a short period of time during which the utterance occurs, together with its location. I’ll call these *located-moments*, and then shorten that to *moments*, at least when issues about time are most relevant. Call the function from an utterance to the moment during which it occurs *Mom*. For each such moment, there is the day during which it occurs, determined by the time it occurs the time-zone in which it occurs, unless it is interrupted by the stroke of midnight. Call this partial function *Dayof*, so *Dayof(m)* is an ordinary 24-hour day, determined by the time and location of the moment. The domain of *Dayof* is not restricted to moments during which utterances occur.

Combining *Dayof* with our three partial functions, we have three more partial functions, from moments to days. I’ll call such partial functions *roles*, for reasons made (more or less) clear later.

$$\mathcal{R}_{\text{Tom}}(m) = d \text{ iff } \exists d' [d' = \text{Day}(m) \ \& \ d = \mathcal{F}_{\text{Tom}}(d')];$$

$$\mathcal{R}_{\text{Yes}}(m) = d \text{ iff } \exists d' [d' = \text{Day}(m) \ \& \ d = \mathcal{F}_{\text{Yes}}(d')];$$

$$\mathcal{R}_{\text{Tod}}(m) = d \text{ iff } \exists d' [d' = \text{Day}(m) \ \& \ d = \mathcal{F}_{\text{Tod}}(d')];$$

Given this, it is natural to frame semantics for temporal indexicals in terms of our three functions, plus *Mom*:

(11) An utterance *u* of ‘tomorrow’ refers to *d* iff

$$\exists m [Mom(u) = m \ \& \ d = \mathcal{R}_{\text{Tom}}(m)]$$

And similarly for ‘yesterday’ and ‘today’.

Now consider (9), my mother’s utterance. We can treat this as we did (6). (6) involved an undexical use of ‘local’; (9) involves undexical uses of ‘today’ and ‘tomorrow’. So we add to our semantics:

(12) ‘Tomorrow’ may be used indexically (the default), as a bound variable or anaphorically.

(i) If u is an **indexical** use, u refers to d iff

$$\exists m [Mom(u) = m \ \& \ d = \mathcal{R}_{Tom}(m)].$$

(ii) If u is a **bound variable** use, d is assigned to u *relative to m* iff

$$d = \mathcal{R}_{Tom}(m)$$

(iii) If u is an **anaphoric** use, u refers to d iff

$$\exists d' [d' \text{ is salient from the context of } u \ \& \ d = \mathcal{F}_{Tom}(m)].$$

And similarly for ‘yesterday’ and ‘today’.

Here are illustrations of these alternatives.

(13) The Questions Group meets tomorrow at 4 p.m.

An utterance u of (13) is true if the Questions Group meets at 4 p.m. on the next day after u , that is, on $\mathcal{F}_{Tom}(m)$, where m is the moment of u .

‘Tomorrow’ provides the role $\mathcal{R}_{Tom}()$, and the utterance provides the moment m .

(9) Never put off until tomorrow what you can do today.

Here ‘tomorrow’ provides the function $\mathcal{F}_{Tom}()$. The argument is not provided by the utterance, but by the quantifier ‘never’, and similarly with ‘today’. That is, for any moment m , do not, at m , put off until $\mathcal{R}_{Tom}(m)$ a task that you can do on $\mathcal{R}_{Tod}(m)$.

(14)

- (a) Last week I was in early in for the Questions Group, thinking it was Thursday and feeling good about being prompt. But it was Wednesday.
- (b) Then I realized that it wasn't meeting *today* but *tomorrow*.
- (c) Then I felt like an idiot.

In (14b), ‘today’ and ‘tomorrow’ occur anaphorically. They provide $\mathcal{R}_{\text{Tod}}()$ and $\mathcal{R}_{\text{Tom}}()$. The argument for these roles is provided by the moment of realization, the same moment referred to by ‘then’.

The idea is that some expressions can be used indexically or undindexically; this is a feature set by context, in the ordinary sense. We call expressions “indexicals” (at least philosophers do), if the default is the indexical use. Perhaps it would be better to simply say that many expressions can have indexical uses; for some of these it is the default; and for some of these, it is a very strong default. In the case of ‘yesterday’, ‘today’, and ‘tomorrow’, it seems the strength of the default is not so strong as with ‘here’ and ‘this’. The same seems to be true of ‘past’, ‘present’, and ‘future’.

PAST, PRESENT, AND FUTURE

‘Past’, ‘present’, and particularly ‘future’ are often used undindexically, as in a remark a parent might make today, in 2014:

- (15) After her concussion in 2005, my 15 year-old daughter was very worried about whether she could play soccer again in the near future.

The daughter was probably not worried about whether she could play soccer in the near future relative to 2014. Her mother meant that, back in

2005, she was worried about the near future relative to 2005 --- the following season, perhaps. ‘Future’ gives us a partial function from a located moment to something like the set of moments occurring later than it. If I say, now,

(16) I’m worried about what the near future holds for my Apple stock.

I’m most likely expressing worry about what will happen tomorrow and in the next couple of weeks after that on the stock market; I’m using ‘future’ indexically. In (15) it is used anaphorically. And in (17) it is bound:

(17) However rotten a day has been, optimists go to bed that night thinking the future will be better.

Although ‘present’, ‘past’, ‘future’ appear often in list of indexicals, their undindexical use is not jarring and quite common. If the indexical use is the default, it is a weaker default than in the case of ‘today’, ‘tomorrow’ and ‘yesterday’.

‘Future’, ‘present’, and ‘past’ provide these roles, where ‘m’ ranges over located moments of time:

$$\mathcal{R}_{\text{Fut}}(m) = \{m' \mid m' \text{ happens after } m\}$$

$$\mathcal{R}_{\text{Pres}}(m) = \{m \mid m \text{ happens more or less at the same time as } m\}$$

$$\mathcal{R}_{\text{Past}}(m) = \{m \mid m \text{ happens before } m\}$$

4 ROLES AND INFORMATION GAMES

Why do we use at least some indexicals undindexically? Why, for example, would my mother have said,

(9) Never put off until tomorrow what you can do today,

in order to express

- (10) For all times t , do not put off until the day *after* t , what you can do on the day *of* t .

rather than something like,

- (10a) When you have something to do, don't put it off until the next day.

My suggestion is that the undindexical use of indexicals has a certain useful cognitive effects in virtue of their default indexical uses. Developing this suggestion requires the concepts of a role and of role-linking. It will serve, I hope, as an example of how thinking in terms of utterances helps for certain purposes.

A person who understands “tomorrow” grasps at some level that it expresses the function “being the day after,” and that in its standard uses, the value of the function has what Peirce, who coined the term ‘indexical’, would deem an actual connection to the utterance: being the day after it occurs.⁴ The utterance has a real relation (occurring during) to one day, and thereby a real relation (occurring the day before) to the referent. So we have two functions, from days to days, and from the moments on which utterances or thoughts occurred, or might have, to days.

In general, I say that roles are *linked*, if relationships among the role-arguments map onto relations among the role-values. However, for the purposes of this paper, I'll only consider the special case where the two roles have the same argument. For example,

$$\forall m [\mathcal{R}_{\text{rest}}(m) \text{ is two days before } \mathcal{R}_{\text{tom}}(m)].$$

⁴ See Mats Bergman & Sami Paavola (2003--), Burks (1949).

So the roles $\mathcal{R}_{Y_{est}}$ and $\mathcal{R}_{T'om}$ are linked, the value of one will always be two days from the value of the other, given the moment as input argument.

In this case, the linkage is due to the structure of time, and so extremely stable, perhaps necessary. More interesting are cases in which roles are linked contingently, but due to architectural or environmental facts that are reliable enough to allow for the formation of habits through learning of various sorts, and even evolutionary characteristics.

Here is a not very profound example. Consider an automobile. In the normal case of a normal driver in a normal automobile, all of these roles will be linked, where d is the driver:

If c = the car which d is driving, then

if b = the brake pedal d steps on, b operates the brakes of c ;

if s = the steering wheel d operates, d turns the wheels of c ;

if w = the windshield d looks through, w is the windshield of c ;

and so forth.

These linkages are due to the architecture of humans and automobiles. They are contingent. Perhaps some day we will require candidates for a driver's license to drive “solo” at some point late in their training. To keep things safe, we design an interconnected pair of cars. The teacher, driving in one car, can throw a switch, so her own car goes on some sort of autopilot and she teakes over the operation of steering, braking and accelerating in the other car. Now the teacher has to keep track of *which* car she will slow down by stepping on the brake, and which car she will turn with the steering wheel in her hands.

Intelligent life is based on linking roles. The objects in front of us are the objects we find out about with our eyes, the objects we can advance towards by moving our feet, and so on.

The roles that are assigned by language to ‘today’, ‘tomorrow’, ‘yesterday,’ ‘now’, ‘present’, ‘past’ and ‘future’ are linked to important roles that are primitive parts of animal life. When we use the temporal indexicals in the standard way, they refer to a period of time that plays the role associated with the indexical, relative to a moment m , the moment when we use them. This period of time will also play a number of other important and more primitive roles relative to m ; that is, these roles are *linked*.

This is clearest with respect to ‘today’. At any given moment, there is a day we can *find out about* just by using our eyes and looking around us (and ears, etc). The same day that plays the role, *day referred to at m by using ‘today’* also plays the role *day found out about at m by just looking*.

This day will also play many roles connected to various of our actions. The effects our movements at m will have, that determine which acts we perform, will be determined at least in part by facts about the same day we would refer to with ‘today’.

Suppose, for example, that it 10 a.m. on a certain day in January. I need to walk the dog, and am going to do so at 10 a.m. plus a minute or two. I look outside and find out, about a certain day, whether it is raining at 10 a.m. on that day. The day I find out about is the same day on which I will walk the dog. If it is raining, that means I will get wet, unless I take an umbrella. So I pick up an umbrella. The day whose weather affects whether or not this act succeeds in keeping me dry, will be the day whose weather I can find out about by looking, and also the day I can refer to with “today”. I shall say that there at any moment m various *methods* for finding out about days that are normally *today-informative*. And, there are ways of acting at a moment m that are normally *today-sensitive*, in that it is facts about the day of which m is a part, that will determine the success or failure of these acts. The success of any act inaugurated with a movement today, no

matter how far in the future its defining effect is intended to occur, will depend in part on what things are like today.

So there are *normally today-informative* methods of finding out about days, and *normally today-sensitive* ways of acting. These methods of getting information and ways of acting are in the repertoire of animals even plants, but they are also very basic to the way humans work. The same goes for ‘yesterday’ and ‘tomorrow,’ but only to a limited extent. You can learn about yesterday by remembering, and about tomorrow by consulting your intentions. But these role linkages are not nearly so primitive as those for ‘today’.

But, in the not very primitive world of today’s humans, there are all sort of ways of getting information about the future. The department secretary sends a message that an oral exam is scheduled a month hence. If I am on the committee, there are some things I can and should do today, or as soon as possible: check that I am in town that day, and my schedule is clear at the appropriate hour. On the day of the exam, there are other things I will need to do, such as walk to the place of the exam. In between I should read the dissertation.

Humans live in a world in which ways of gaining information about objects that do not play relatively primitive roles in our lives are rampant. There are *detached* pools of information, like the cels on wall calendars. The information can be accessed on different days, and by different people. That is useful. But that also means that the information is *incomplete*. The way the information is labelled in the detached data-base, as “September 14”, say, needs to be connected to role-based ways of knowing about things and acting in ways sensitive to them, before it can be put to use in guiding action. We need to know whether September 14 is in the past, present, or future, whether it is yesterday, today, or tomorrow, to be able to act

appropriately, or regret having missed the chance to do so. Similarly, information gained in primitive ways, by perceiving things, can't be entered into a detached data-base like a calendar until the label is linked to such primitive methods on inquiry. This is my roundabout way of saying the information on the calendar about today's San Jose Giants game won't help me get to the game, unless I know that *today* is September 14. I go to the game tonight, and want to record the score on the calendar for posterity I need to know that *today* is September 14.

That said, let's consider the question asked at the beginning of this section. Why did my mother say,

(9) Never put off until tomorrow what you can do today,
rather than (10a)

(10a) When you have something to do, don't put it off until the next day.

She was trying to influence the way my brain works, not by conditioning but by persuasion. She want to link the roles, *being something that can be done today* and *being something I'll do today*. When I have a thought of the sort, "I can do this today," she wanted me to have a thought of the sort, "So, I will," and not, as perhaps she had noticed was pretty common, the thought, "But I'll do it tomorrow instead." Although she uses 'today' and 'tomorrow' undexically, she counts on the words to suggest states of mind in which I use them indexically, to think about the day of thinking as *today*, and the next day as *tomorrow*.

Certain emotions are also connected with these kinds of relations. We regret or take pride in what we did in the past; we dread or look forward to what will occur in the future. When my mother says "Don't put off until tomorrow what you can do today," part of the policy she wants me to adopt

connects not only with the epistemic methods but also with the emotions that are associated with ‘tomorrow’ and ‘today’.

There is a way of doing something today; you get started on it, or at least set aside some time to get started on it; having done this, you feel some sense of urgency; it nags at you until you get it done. You don't do other things that you might prefer to do. I'm sure this was how it was with my mother, and she assumed it would be the same with me. And there is a way of putting something off until tomorrow. You form a vague intention about what to do tomorrow, and quit worrying about it, and don't let it occupy your mind or otherwise interfere with the things you want to do today. My mother was telling me that when I was tempted to adopt the second stance towards a task, the *tomorrow* stance, I should instead adopt the first one, the *today* stance. She was using ‘today’ and ‘tomorrow’ undindexically, but she wants to influence what I do when I think them indexically:

Each day, when you wake up and look around, and go over the things you need to do, you will find yourself thinking, about some tasks, “I could do that *today*, but I could put it off until *tomorrow*. Doing it today means getting started now, and not doing a number of other things I would rather do. So I guess I'll do those other things today, and do it tomorrow.” *Don't give in to this way of thinking.*

4. INDEXICALITY

As is the case with many linguistic phenomena of philosophical importance, the peculiarities of ‘local’ were brought to our attention by Barbara Partee. She did not conclude that ‘local’ was an indexical. Whether this was simply, as a suspect, because the expression does not work as predicted by Kaplan’s theory, or for deeper grammatical reasons beyond my ken, I am

not sure. In any case, the term is less common in linguistics, where the favored terms are ‘deictic’ and ‘deixis’.

Syntactically the standard indexicals vary. ‘I’ and ‘you’ are pronouns; ‘here’, ‘today’ and many others are adverbs; ‘past’ and ‘present’ are adjectives. Indexicality, on the approach I am advocating, seems to be a semantic feature, shared by many expressions of diverse syntactic categories. Their extension, at least in some uses, depends on the properties of the utterances in which they occur, including, and perhaps limited to, the properties Kaplan collected in his concept of “context”, the speaker, time, and location of the utterance. Among these, those with a strong default for indexical uses comprise what philosophers usually call “indexicals”. Given this usage, my claim is that indexicality is a feature that many expressions, such as ‘local’ share with the indexicals proper, without sharing having indexical uses as a strong default.

5. CONCLUSION

On my account, the meanings of expressions with indexical uses provide us with roles: functions from agents, times and locations to appropriate objects, like sets of locations, or stretches of time, or particular people and things. When such expression are used indexically, the arguments for those roles are provided by the speaker, time, and locations of the utterance. However, many of these expressions, including some on the standard list of indexicals, can be used undexically. In these uses the designation is the object that plays the mandated role relative to some agents, times and locations supplied anaphorically, or by a quantifier. For most familiar indexicals, like ‘here’, ‘I’ and ‘today’, the clear default use is the indexical use. For ‘past’, ‘present’ and ‘future’ it is at most a weak default. With other expressions that often function indexically, but are not

usually counted as indexicals, such as ‘local’, anaphoric and quantificational uses are as acceptable as indexical uses.

Treating indexicality within theory of utterances is helpful in understanding this flexibility. Further, it illuminates how the roles that are associated by the conventions of language with indexicals are typically linked to important informational and pragmatic roles whose importance to intelligent life is independent of language.

Bergman, Matts and Sami Paavola (eds.). (2003--) *The Commens Dictionary. Peirce’s Terms in His Own Words*
<http://www.helsinki.fi/science/commens/dictionary.html>.

Burks, Arthur (1949). Icon Index and Symbol. *Philosophy and Phenomenological Research* 1949.

Israel, David and John Perry (1996). [Where Monsters Dwell](#). In J. Seligman and D. Westerstahl (eds.). *Logic, Language and Computation*, Vol. 1. Stanford: CSLI Publications.

Kaplan, David. (1989). Demonstratives. In J. Almog, J. Perry, and H. Wettstein (eds.). *Themes From Kaplan*. New York: Oxford University Press: 481–563.

Korta, Kapa and John Perry (2011). *Critical Pragmatics*. Cambridge University Press.

McTaggart, John McTaggart Ellis (1908) The Unreality of Time. *Mind*.

Perry, John (2011). *Reference and Reflexivity*, 2nd edition. Stanford:
CSLI Publications.