You and I in Modal Logic

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Basic properties of indexicals

Context dependence (Kaplan)

- Distinct occurrences of indexicals may have distinct referents in distinct **contexts**:

  (1)   I am tired today.

     a.   David Kaplan is tired on 26 March 1977.
     b.   Maria Aloni is tired on 30 April 2018.

- 'I' refers to the speaker in the context of utterance, 'today' refers to the day in the context of utterance.

Contingent a priori (Kripke, Kaplan)

- Indexicals typically appear in contingent a priori statements:

  (2)   I am here today.

Insensitivity to intensional operators

- Classical example (Kaplan):

  (3)   It is possible that in Pakistan, in five years, only those who are actually here now are envied.

  'Actually', 'here' and 'now' naturally interpreted wrt *actual utterance situation* despite the presence of shifting operators

- Aside: Potential counterexamples to this specific claim (Hunter 2012):

  (4)   And what would terrify the right, of course, is the likelihood that genuine socialized medicine would **actually** win that competition.

  (5)   All over England folk began to hear of the wonderful saint who lived alone in the desert island, [. . .] He built a house by the landing-place on the island for his visitors to stay in, and **here**, too, his monks would come on festivals to have a talk with him.

  (6)   Brutally, the banks knowingly gamed the system to grow their balance sheets ever faster and with even less capital underpinning them in the full knowledge that everything rested on the bogus claim that their lending was **now** much less risky.

- I will exclusively focus on 'you' and 'I', which arguably don't have such 'anaphoric' uses

Indexicals *vs* definite descriptions

(7) The chancellor of Germany could have been a Social Democrat.
   - a. Angela Merkel could have been a Social Democrat.
     De re: $\exists x[x = \text{the chancellor} \land \Diamond Dx]$
   - b. A Social Democrat (Schulz) could have been the chansellor
     De dicto: $\Diamond \exists x[x = \text{the chancellor} \land Dx]$

(8) I could have been a Social Democrat.   (used by Angela Merkel)
   - a. Angela Merkel could have been a Social Democrat
   - b. #A Social Democrat could have been speaking

▶ How to account for the contrast between (7) and (8)?

1st strategy: Indexicals always have primary scope

- Indexicals as wide scope definite descriptions ('I' $\mapsto$ *the speaker*):

  (9) I could have been a Social Democrat.   (used by Angela Merkel)
      'Merkel could have been a Social Democrat'
      a. *De re*: $\exists x[x = the\ speaker \land \Diamond Dx]$
      b. #*De dicto*: $\Diamond \exists x[x = the\ speaker \land Dx]$

  $\Rightarrow$ *De dicto* representation never generated or somehow ill-formed

- Recent implementations
  - Indexicals as presupposition triggers with preference for global resolutions in DRT (Zeevat, Roberts, Hunter & Asher, Hunter)

- Problem (Maier 2009, echoing Kripke)

  (10) a. The speaker is speaking.   [necessary]
        b. I am speaking.   [contigent]
        c. $\exists x[x = the\ speaker \land Sx]$

No way to distinguish between (10-a) and (10-b), both represented as (10-c)

2nd strategy: Kaplan's two-dimensional analysis

- Indexicals interpreted wrt to **contexts** $c = \langle s_c, a_c, \ldots, w_c \rangle$ rather than **worlds** w: [where $s_c, a_c \in D$, $w_c \in W$ in $M = \langle W, R, D, I \rangle$]

  (11)   a. $[\![I]\!]_{M,c,w,g} = s_c$ (*the speaker in c*)
          b. $[\![you]\!]_{M,c,w,g} = a_c$ (*the addressee in c*)

- Both representations in (12) give rise to the same reading:

  (12)   I could have been a Social Democrat.   (used by Merkel)
           'Merkel could have been a Social Democrat'
           a.   *De re*: $\exists x[x = I \wedge \Diamond Dx]$
           b.   *De dicto*: $\Diamond \exists x[x = I \wedge Dx]$

- This prediction relies on various assumptions:
  1. Modals cannot shift the context parameter
  2. Indexicals are directly referential and, therefore, rigid designators
  3. Variables are rigid designators ("the paradigm of direct reference")

- IN THIS TALK:
  - Challenge assumptions 2 and 3: against rigidity!
  - Propose a pragmatic account of the interaction between indexicals and intensional operators

Motivation for a pragmatic account: descriptive uses

- **Deferred Reference**

  (13) *Condemned prisoner*: I am traditionally allowed to order
        whatever I like for my last meal.   [Nunberg 1993, p. 20]

  (14) Why did you open the door without checking? You should be
        more careful! I could have been a burglar.
                                              [Hans Kamp, from Maier 2009, p. 285]

- Intended reading (15-b) not predicted by Kaplan's analysis. Both
  representations in (16) give rise to reading (15-a):

  (15) I could have been a burglar.   (used by Hans Kamp)
        a. Hans Kamp himself could have been a burglar
        b. A burglar could have been knocking at the door

  (16) a. *De re*: $\exists x[x = I \land \Diamond Bx]$
        b. *De dicto*: $\Diamond \exists x[x = I \land Bx]$

Motivation for a pragmatic account: descriptive uses

- **Descriptive reading of Merkel's example**

    (17)   *Context:* In the middle of the campaign, Merkel asks her
           assistant via WhatsApp permission to access confidential
           documents describing the CDU strategy. Her assistant complies
           with her request, but later, during a security awareness meeting,
           Merkel approaches him:

    (18)   Why did you give me access to the files? You should be more
           careful! I could have been a Social Democrat.

- Intended reading (19-b) not predicted by Kaplan's analysis. Both
  representations in (20) give rise to reading (19-a):

    (19)   I could have been a Social Democrat.   (used by Merkel)
           a.   Merkel could have been a Social Democrat
           b.   A Social Democrat could have sent you the message

    (20)   a.   *De re*: $\exists x[x = I \wedge \Diamond Dx]$
           b.   *De dicto*: $\Diamond \exists x[x = I \wedge Dx]$

$\Rightarrow$ Kaplan's account of interaction between indexicals and modals not
  flexible enough to account for these cases

Motivation for a pragmatic account: descriptive uses

- **Indexicals in 3rd person attitude reports**

  (21) *Context:* Miss Jones, the new director of Lorenzo's school, would assent to 'Lorenzo's mother is Spanish'. She further has no idea who Lorenzo's mother is. Lorenzo's mother name is Maria. Maria reports to her husband: [Aloni 2001, 2005]

  (22) Miss Jones believes that I am Spanish. [true]

- Intended reading (23-b) not predicted by Kaplan's analysis. Both representations in (24) give rise to reading (23-a):

  (23) Miss Jones believes that I am Spanish.
      a. Miss Jones would assent to 'This individual (pointing at Maria) is Spanish'
      b. Miss Jones would assent to 'Lorenzo's mother is Spanish'

  (24) a. *De re*: $\exists x[x = I \wedge \Box Sx]$
      b. *De dicto*: $\Box \exists x[x = I \wedge Sx]$

Outlook

1. Against rigidity!
   - Phone booth and amnesiacs
   - Counterindexicals and dream reports
2. A two-dimensional semantics w/o rigidity
   - First attempt: indexicals as non-rigid designators in a classical two-dimensional modal logic
   - Proposal: a two-dimensional modal logic under conceptual covers
3. Indexicals under intensional operators: a pragmatic account

Against rigidity!

Phone booth

Consider A – a man stipulated to be intelligent, rational, a competent speaker of English, etc.– who both sees a woman, across the street, in a phone booth, and is speaking to a woman through a phone. He does not realize that the woman to whom he is speaking – B, to give her a name – is the woman he sees. He perceives her to be in some danger – a run-away steamroller, say, is bearing down upon her phone booth. A waves at the woman; he says nothing into the phone   [Richard 1983, p. 439]

(25) a. (I believe) she is in danger.   [true]
      b. (I believe) you are in danger.   [false]

Amnesiacs

Rudolf Lingens and Gustav Lauben are amnesiacs: each of them knows that he is one of the two, but doesn't know which.   [adapted from Santorio 2012]

(26) a. I might be Rudolf Lingens.   [true]
      b. I might be Gustav Lauben.   [true]

   $\Rightarrow$ Dropping (epistemic) rigidity for indexicals could give us an account of these cases

Against rigidity!

Counteridenticals

[Goodnam 1984, Kocurek 2016, Kauf 2017]

(27)   If I were you, I would not push that button.

(28)   If I were Hillary Clinton, I'd live in New York and I'd have a great apartment.

Dream reports

[Lakoff 1996, Percus & Sauerland 2003]

(29)   I dreamt I was you.

(30)   a.   I dreamt I was Brigitte Bardot and I kissed me.
        b.   I dreamt I was Brigitte Bardot and I kissed myself.

⇒ Dropping rigidity for indexicals (and other referential expressions) could give us an account of these cases

Two-dimensional semantics w/o rigidity: first attempt

- New definition of a context: (based on $M = \langle W, R, D, I \rangle$)

  (31) A context c is (at least) a triple $\langle \mathbf{s_c}, \mathbf{a_c}, w_c \rangle$ such that
    (i) $\mathbf{s_c}, \mathbf{a_c} \in D^W$
    (ii) $\mathbf{s_c}(w_c) = [\![\text{the speaker}]\!]_{w_c}$ & $\mathbf{a_c}(w_c) = [\![\text{the addressee}]\!]_{w_c}$

- Main features:
  - Contexts supply individuating functions (or concepts) rather than objects:
    $$\mathbf{s_c} \in D^W \text{ (rather than } s_c \in D)$$
  - The value of $\mathbf{s_c}$ in w_c is the speaker in w_c:
    $$\mathbf{s_c}(w_c) = [\![\text{the speaker}]\!]_{w_c}$$
  - But crucially $\mathbf{s_c}$ need not be equivalent with $\lambda w.[\![\text{the speaker}]\!]_w$

- New interpretation of indexicals:

  (32) a. $[\![I]\!]_{M,c,w,g} = \mathbf{s_c}(w)$
        b. $[\![you]\!]_{M,c,w,g} = \mathbf{a_c}(w)$

Applications

- Richard's phone booth:

  (33) a. (I believe) she is in danger.   [true]
        b. (I believe) you are in danger.   [false]

  'you' and 'she' can be assigned different individuating functions even
  though they refer to one and the same individual in the actual world

- Santorio's amnesiacs case:

  (34) a. I might be Rudolf Lingens.   [true]
        b. I might be Gustav Lauben.   [true]

  s_c need not be a constant function

- Kripke/Maier case:

  (35) a. I am speaking.   [contingent]
        b. The speaker is speaking.   [necessary]

  s_c need not be equivalent with $\lambda w.[\![\textit{the speaker}]\!]_w$

Applications

- Descriptive uses, e.g. Kamp's burglar:

  (36) I could have been a burglar. $\mapsto \Box\exists x[x = I \wedge Bx]$ (*de dicto*)
        'A burglar could have been knocking at the door'

  $\mathbf{s_c}$ can be equivalent to $\lambda w.[\![$*the person knocking at the door*$]\!]_w$

- Counteridenticals and dreams:

  (37) If I were you, I would not push that button.   [not trivial]

  (38) I dreamt I was you.   [no contradiction]

  $\mathbf{s_c}$ and $\mathbf{a_c}$ can have overlapping values even though they stand for different individuals in the actual world

Problems: Brigitte Bardot cases

▶ No account of Lakoff's Brigitte Bardot cases:

(39)   a.   I dreamt I was Brigitte Bardot and I kissed me.
         b. $\Box(I = bb \wedge K(I, I))$

(40)   a.   I dreamt I was Brigitte Bardot and I kissed myself.
         b. $\Box(I = bb \wedge K(I, I))$

(39) and (40) cannot be distinguished, all occurrences of 'I' interpreted wrt one $\mathbf{s_c}$

▶ And of counteridentical examples with similar structure (Kocurek):

(41)   a.   If I were you, I would vote for me.   ('Vote for me!')
         b. $\Box(I = you \supset V(I, I))$

(42)   a.   If I were you, I would vote for myself.   ('Vote for you!')
         b. $\Box(I = you \supset V(I, I))$

▶ Solution in counterpart accounts of these cases: more than one counterpart for referent of 'I' in relevant worlds

Problems: logic of reference

▶ Standard Kaplanian principles fail to be validated:

SI $\quad \not\models_{2D_R} I = x \to (\phi[I] \to \phi[x])$ $\qquad$ (substitutivity of identicals)

EG $\quad \not\models_{2D_R} \phi[I] \to \exists x \phi[x]$ $\qquad\qquad$ (existential generalisation)

Kaplan

	SI	**EG**
variables	yes	yes
indexicals	yes	yes
definites	no	no

First attempt ($2D_R$)

	SI	**EG**
variables	yes	yes
indexicals	no	no
definites	no	no

$\Rightarrow$ Indexicals no longer genuine referential expressions:
  ▶ *you* and *I* stand for ways of representing objects ($\alpha \in D^W$), rather than for the objects themselves ($d \in D$)
$\Rightarrow$ Difference indexicals *vs* definite descriptions no longer accounted for

Problems: ordinary uses of indexicals

- Back to our first Merkel example:

  (43) I could have been a Social Democrat.   (used by Merkel)
      a. Merkel could have been a Social Democrat
      b. #A Social Democrat could have been speaking

  Nothing prevents $\mathbf{s_c}$ to be equivalent to $\lambda w.[\![\textit{the speaker}]\!]_w$, so de dicto (44-b) could mean (43-b):

  (44) a. *De re*: $\exists x[x = I \wedge \Diamond \phi]$
      b. *De dicto*: $\Diamond \exists x[x = I \wedge \phi]$

Standard solution

- Ban "bad" (descriptive) concepts from our contexts!
  (e.g. via metaphysically plausible counterpart relations or acquaintance)
- But then if indexicals cannot be assigned "bad" concepts, descriptive uses no longer generated, no account of (45):

  (45) (Why did you open?) I could have been a burglar.
      'A burglar could have been knocking at the door'

Proposal (Aloni 2001, 2005)

- Rethink the way of modelling the objects we refer to in conversation
- Pragmatic account of the difference between ordinary and descriptive uses

Quantification in situations of partial information

Card scenario

Two face-down cards, the ace of hearts and the ace of spades.
Anna knows that the winning card is the ace of hearts, but doesn't
know whether it's the card on the left or the one on the right.

(46)   Anna doesn't know which card is which.

How to express (46) in epistemic logic?

(47)   Anna knows which card is the winning card.

True or false?

Intuitive analysis

Two salient ways to identify the cards:

1. By their position: the card on the left, the card on the right
2. By their suit: the ace of hearts, the ace of spades

Whether (47) is judged true depends on which of these perspectives is adopted;
(46) can be expressed if we allow both identification methods to play a role.

Conceptual Covers

- Identification methods can be formalized as *conceptual covers*:

  (48)   A conceptual cover CC based on $\langle W, D \rangle$ is a set of functions from W to D s.t.: $\forall w \in W : \forall d \in D : \exists! c \in CC : c(w) = d$

  In each world each individual is identified by at least one concept (existence); in no world is an individual counted twice (uniqueness)   [Aloni 2001, Aloni 2005]

Card scenario

- 3 salient covers/ways of identifying the cards:

  (49)   a.   {on-the-left, on-the-right}   [perceptually-based]
         b.   {ace-of-spades, ace-of-hearts}   [naming]
         c.   {the-winning-card, the-losing-card}   [description]
         d.   #{on-the-left, ace-of-spades}   [not a cover]

- In a conceptual cover, each individual in the domain is identified in a determinate way;

- Different conceptual covers constitute different ways of conceiving one and the same domain.

Quantification under conceptual covers

- Variables x_n range over elements of a pragmatically selected cover $\wp(n)$:

$$M, w \models^{\wp}_g \exists x_n \phi \quad \text{iff} \quad \exists \alpha \in \wp(n) : M, w \models^{\wp}_{g[x_n/\alpha]} \phi$$

where $g(x_n) \in \wp(n)$ & $[\![x_n]\!]_{M,w,g} = g(x_n)(w)$

- Sound and complete axiomatisation in Aloni (2001, 2005).

Application to card scenario

- Evaluation of (50) depends on which cover is adopted:

(50) a. Anna knows which$_n$ card is the winning card.
b. $\exists x_n (Cx_n \wedge \Box x_n = the\ winning\ card)$

(51) a. False, if $n \mapsto \{\text{on-the-left, on-the-right}\}$
b. True, if $n \mapsto \{\text{ace-of-spades, ace-of-hearts}\}$
c. Trivial, if $n \mapsto \{\text{the-winning-card, the-losing-card}\}$

- Representation of (52) involves a shift from one cover to the other

(52) a. Anna doesn't know which$_n$ is which$_m$.
b. $\forall x_n \forall y_m \neg \Box x_n = x_m$

Further applications: double-vision, identity questions, concealed questions, ...

Two-Dimensional Semantics with Conceptual Covers

- ▶ Quantification as in modal logic under conceptual covers
  - ▶ Variables x_n range over elements of pragmatically selected conceptual cover $\wp(n)$:

  $$M, c, w \models_g^\wp \exists x_n \phi \quad \text{iff} \quad \exists \alpha \in \wp(n) : M, c, w \models_{g[x_n/\alpha]}^\wp \phi$$

- ▶ Contexts, modals and validity as in Kaplan
  - ▶ Contexts are tuples $c = \langle s_c, a_c, \ldots, w_c \rangle$ containing actual speaker, addressee and world, where $s_c, a_c \in D$ & $w_c \in W$
  - ▶ Modals do not manipulate context parameter:

  $$M, c, w \models_g^\wp \Box \phi \quad \text{iff} \quad \forall w' \in W : wRw' \Rightarrow M, c, w' \models_g^\wp \phi$$

  - ▶ Real-world validity as logical validity:

  $$\models_{2D_{cc}} \phi \text{ iff } \forall M, c, w, g, \wp : M, c, w_c \models_g^\wp \phi$$

- ▶ New view on indexicals
  - ▶ Indexicals I_n, you_n assigned elements of pragmatically selected conceptual cover $\wp(n)$, rather than elements of D:

  $$[\![I_n]\!]_{M,c,w,g}^\wp = \alpha(w), \text{ where } \alpha \in \wp(n) \ \& \ \alpha(w_c) = s_c$$

  $$[\![you_n]\!]_{M,c,w,g}^\wp = \alpha(w), \text{ where } \alpha \in \wp(n) \ \& \ \alpha(w_c) = a_c$$

Applications: basic properties and non-rigidity

- ▶ Context dependence and contingent a priori (as in Kaplan)

  (53) $\models_{2D_{cc}} I_n = \text{the speaker}$ (a priori)

  (54) $\not\models_{2D_{cc}} \Box I_n = \text{the speaker}$ (but not necessary)

- ▶ Phone booth and amnesiacs (as in $2D_R$)

  (55) $\not\models_{2D_{cc}} you_n = she_m \rightarrow \Box you_n = she_m$

  you and *she* can be assigned elements of two different perceptually-based covers (visual vs auditory)

  (56) $\not\models_{2D_{cc}} I_n = a \rightarrow \Box I_n = a$

  Perceptually-based concepts need not be constant functions

Applications: dreams and counterindexicals

- Basic cases:

  (57)   a.   If I were you, I would not push that button.

             b. $\Box(I_n = you_m \supset \neg P(I_n, b))$

  (58)   a.   I dreamt I was you.

             b. $\Box I_n = you_m$

  If n and m are assigned different values, (57) and (58) are not predicted to be trivial or implying contradictory dreams

- CC-indices further exploited for ready account of 'Brigitte Bardot' cases (Lakoff):

  (59)   a.   I dreamt I was Brigitte Bardot and I kissed me.

             b. $\Box(I_n = BB \land K(I_n, I_m))$

  (60)   a.   I dreamt I was Brigitte Bardot and I kissed myself.

             b. $\Box(I_n = BB \land K(I_n, I_n))$

  (61)   a.   If I were you, I would not trust me.

             b. $\Box(I_n = you_m \supset V(I_n, I_l))$ ('Don't trust me!')

  (62)   a.   If I were you, I would not trust myself.

             b. $\Box(I_n = you_m \supset V(I_n, I_n))$ ('Don't trust yourself!')

Applications: logic of reference

- While substitutivity of identicals and existential generalisation fail in general:

  SI $\quad \not\models_{2D_{cc}} x_n = y_m \rightarrow (\phi[x_n] \rightarrow \psi[y_m])$

  EG $\quad \not\models_{2D_{cc}} \phi[y_m] \rightarrow \exists x_n \phi[x_n]$

- Restricted forms are validated for variables and indexicals:

  (63) $\quad \models_{2D_{cc}} x_n = y_n \rightarrow (\phi[x_n] \rightarrow \psi[y_n])$
  $\models_{2D_{cc}} I_n = y_n \rightarrow (\phi[I_n] \rightarrow \psi[y_n]) \ (\Rightarrow \models_{2D_{cc}} I_n = y_n \rightarrow \Box I_n = y_n)$

  (64) $\quad \models_{2D_{cc}} \phi[y_n] \rightarrow \exists x_n \phi[x_n]$
  $\models_{2D_{cc}} \phi[I_n] \rightarrow \exists x_n \phi[x_n]$

- But not for definites:

  (65) $\quad \not\models_{2D_{cc}} \iota z_n P z_n = y_n \rightarrow (\phi[\iota z_n P z_n] \rightarrow \psi[y_n])$

  (66) $\quad \not\models_{2D_{cc}} \phi[\iota z_n P z_n] \rightarrow \exists x_n \phi[x_n]$

  Validities in (63) and (64) rely on uniqueness and existence condition on CC respectively

Applications: logic of reference

▶ In the newly proposed semantics indexicals behave as variables and not as definite descriptions:

$2D_{cc}$	$\mathbf{SI}_n$	$\mathbf{EG}_n$
variables	yes	yes
indexicals	yes	yes
definites	no	no

▶ As in Kaplan, but in contrast to $2D_R$ (our first attempt):

Kaplan	**SI**	**EG**
variables	yes	yes
indexicals	yes	yes
definites	no	no

$2D_R$	**SI**	**EG**
variables	yes	yes
indexicals	no	no
definites	no	no

Back to our first example

(67)   I could have been a Social Democrat.   (used by Merkel)

      a.   Merkel could have been a Social Democrat
      b.   #A Social Democrat could have been speaking

Overgeneration problem

Nothing prevents x_n or l_m to be assigned to $\lambda w.[\![\textit{the speaker}]\!]_w$, so both *de re* and *de dicto* (68-a-b) could mean (67-b):

(68)   a.   *De re*: $\exists x_n[x_n = l_m \land \Diamond Dx_n]$ (only *n* relevant here)
        b.   *De dicto*: $\Diamond \exists x_n[x_n = l_m \land Dx_n]$ (only *m* relevant here)

NB: value of *n* relevant only when x_n/l_n occurs free in the scope of a modal operator, i.e. its referent needs to be identified across worlds

A pragmatic solution

General pragmatic principles prevent descriptive covers to be at work in ordinary cases (as in the first Merkel case), while being possibly operative in extraordinary circumstances (as in descriptive uses)

Pragmatic theory (Aloni 2001)

- ▶ We assume that there are certain default choices for cover indices n;
- ▶ Deviation from default resolution possible, but only justified if needed in order to comply with Gricean principles of conversation.

Proposal

1. **Default resolutions:** Cover indices n, m are by default resolved to the contextually most salient cover, which is typically
   - ▶ a perceptually-based cover, if application criteria satisfied
   - ▶ naming, if application criteria satisfied
   ⇒ Application criteria for perceptually-based cover generally satisfied in the case of indexicals (exceptions are answering machine cases)

2. **Deviation from default resolution licensed:**
   (i) only if necessary to avoid false/vacuous/irrelevant meanings
   [Gricean QUALITY, QUANTITY, RELEVANCE]
   (ii) only if the meaning obtained by shifting to a non-default resolution could not have been expressed in a more perspicuous/effective form
   [Gricean MANNER (as **blocking**)]

A default resolution

▶ In a neutral context deviation from default resolution is unjustified:

(69) I could have been Social Democrat. (used by Merkel)
 'Merkel could have been a Social Democrat'

  a. *De re*: $\exists x_n[x_n = I_m \land \Diamond D x_n]$
  b. *De dicto*: $\Diamond \exists x_n[x_n = I_m \land D x_n]$

  $\Rightarrow$ Optimal resolution: n, m assigned *perceptually-based cover*

 $\Rightarrow$ As in Kaplan, no ambiguity predicted for (69)

(70) The Chancellor of Germany could have been a Social Democrat.

  a. *De re*: $\exists x_n[x_n = \iota y_m C y_m \land \Diamond D x_n]$

   'Merkel could have been a Social Democrat'

   $\Rightarrow$ Optimal resolution: x_n ranges over *naming cover*

  b. *De dicto*: $\Diamond \exists x_n[x_n = \iota y_m C y_m \land D x_n]$

   'A Social Democrat could have been the Chancellor of Germany'

   $\Rightarrow$ (values of n, m irrelevant here)

 $\Rightarrow$ As in Kaplan, (70) predicted to be ambiguous

Deviation triggered by relevance: descriptive uses

▶ Deviation from default resolution licensed if necessary to avoid violation of Gricean principles of conversation:

(71)   Why did you open? I could have been a burglar.
       'A burglar could have been knocking at the door'
       a.   *De re*: $\exists x_n[x_n = I_m \wedge \Diamond Bx_n]$
       b.   *De dicto*: $\Diamond \exists x_n[x_n = I_m \wedge Bx_n]$

       $\Rightarrow$ Optimal resolution: $\lambda w[\![\text{the person knocking at the door}]\!]_w \in n, m$

(72)   Why did you give me access? I could have been a Social Democrat.
       'A Social Democrat could have sent you the message'
       a.   *De re*: $\exists x_n[x_n = I_m \wedge \Diamond Dx_n]$
       b.   *De dicto*: $\Diamond \exists x_n[x_n = I_m \wedge Dx_n]$

       $\Rightarrow$ Optimal resolution: $\lambda w[\![\text{the person sending the message}]\!]_w \in n, m$

$\Rightarrow$ Descriptive readings predicted because default resolution would have led to RELEVANCE violation

'I' vs 'the speaker'

- Nunberg's observation: deferred reference readings not available for definites:

  (73)   Why did you open? I could have been a burglar.
          'A burglar could have been knocking at the door'

  (74)   Why did you open? The speaker could have been a burglar.
          # 'A burglar could have been knocking at the door'

- In our system this means:

  The person knocking at the door can serve as identifying concept in (73), but not in (74).

- But why? What distinguishes the two cases?

  Relevance-justified deviation licensed in (73), but **blocked** in (74) by the availability of a more efficient form for the target content

Blocking effects

(75) Target *content*: 'The person knocking at the door could have been a burglar'

(76) Alternative possible *forms*:
   a. The person knocking at the door could have been a burglar.
   b. I could have been a burglar.
   c. The speaker could have been a burglar.

▶ Target content **blocked** for (c) by more efficient forms (a)-(b):

   (77) The speaker could have been a burglar.
   # 'The person knocking at the door could have been a burglar'

   ⇒ non-default resolution NOT licensed here

▶ Nothing is strictly more effective than form (b) given the circumstances of the utterance ('I' preferred referential device):

   (78) I could have been a burglar.
   'The person knocking at the door could have been a burglar'

   ⇒ non-default resolution licensed here

The referential device principle

A referential device can be selected only if the application criteria of the classes above in the following hierarchy do not apply

(Gundel et al 1993, Zeevat)

NP type	selection condition
reflexive	c-command
1st and 2nd pers. pron.	conversation participant
anaphors	high salience through mention
demonstratives	presence in attention space
short definites	old, dependence on high salient
proper names	familiarity
...	...
long definites	new and unique
indefinites	new

(79)   X is meeting a woman this evening.   [from Grice 1975]

The woman cannot be X's mother, sister, but neither speaker, hearer...

Counteridenticals: deviations triggered by quantity

- ▶ "If I were in your position" cases typical involve descriptive concepts made salient by consequent:

  (80) a. If I_n were you_m, I_n would not push that button.
        b. $\Box(I_n = you_m \supset \neg P(I_n, b))$

  Optimal resolution: $n \neq m$ (otherwise quantity violation). In the most natural reading n ranges over a perceptually based-cover, m over a descriptive cover containing the concept 'the person in the position to push the button'.
  $\Rightarrow$ Predicted meaning: 'If I were in the position to push the button I would not do it'

- ▶ Cases like (81) involve the *self* concept also operative in *de se* readings:

  (81) a. If I_n were you_m, I_n would live in New York.
        b. $\Box(I_n = you_m \supset L(I_n, ny))$

  Optimal resolution: $n \neq m$. In the most natural reading m ranges over a perceptually based-cover, n is a descriptive cover containing the concept 'the person the speaker identifies with herself'
  $\Rightarrow$ Predicted meaning: If I were you, I would live in New York (since you do).

Dreams: deviations triggered by quality

(82)   a.   I$_a$ dreamt I$_b$ was Brigitte Bardot and I$_c$ kissed me$_d$.

       b. $\Box_{I_a}(I_b = bb \land K(I_c, I_d))$

Optimal resolution

- $a \neq b$ (quality) and $c \neq d$ (blocking)
- a is perceptually-based & b includes *self*
- $c = b$ & $d = a$ (economy)

$\Rightarrow$ Predicted meanings: 'Lakoff dreamt Lakoff was BB and BB kissed Lakoff'

(83)   a.   I$_a$ dreamt I$_b$ was Brigitte Bardot and I$_c$ kissed myself$_d$.

       b. $\Box_{I_a}(I_b = bb \land K(I_c, I_d))$

Optimal resolution

- $a \neq b$ (quality) and $c = d$ (referential device)
- a is perceptually-based & b includes *self*
- $b = c = d$ (economy)

$\Rightarrow$ Predicted meanings: 'Lakoff dreamt Lakoff was BB and BB kissed BB'

Conclusion

Summary

- ▶ Indexicals and variables refer to elements of contextually supplied conceptual covers, rather than object *simpliciter*
- ▶ Their interpretations when occurring in an intensional context depend on cover indices resolution:
    - ▶ Ordinary cases obtain from default resolutions;
    - ▶ Extraordinary cases (including descriptive uses and counteridenticals) involve cover shifts triggered by Gricean principles;
- ▶ Descriptive uses predicted to be more marked then counteridenticals because triggered by relevance (highly context dependent)

Future issues

- ▶ More on counteridenticals and dream reports
- ▶ Information-based version of $2D_{cc}$ for a better account of Richard's cases: *You are not in danger but she is in danger*
- ▶ Axiomatization of $2D_{cc}$
- ▶ 'You' and 'I' in dialogues: multiagency, turn-taking, . . .
- ▶ . . .

Lorenzo's mother

Miss Jones, the new director of Lorenzo's school, would assent to 'Lorenzo's mother is Spanish'. She further has no idea who Lorenzo's mother is. Lorenzo's mother name is Maria.

C1 Maria to her husband:

    (84)   Miss Jones believes that *I* am Spanish.

C2 Maria's husband to Maria:

    (85)   Miss Jones believes that *you* are Spanish.

C3 Maria's husband to her mother:

    (86)   Miss Jones believes that *Maria* is Spanish.

C4 Lorenzo's teacher to a colleague:

    (87)   (?) Miss Jones believes that *Maria* is Spanish.

QUALITY triggered perspective shift justified in C1-C3, but not in C4, because only in C1-C3 alternative form (88) would violate RDP:

(88)   Miss Jones believes that *Lorenzo's mother* is Spanish.

Lorenzo's mother: a closer look

(89) Miss Jones believes that I am Spanish. [true in C1]
   'Miss Jones would assent to 'Lorenzo's mother is Spanish''
   a. *De re*: $\exists x_n[x_n = I_m \wedge \square S x_n]$
   b. *De dicto*: $\square \exists x_n[x_n = I_m \wedge S x_n]$

QUALITY justified deviation from default resolution for (89):

$\Rightarrow$ Optimal resolution: $\lambda w [\![Lorenzo's\ mother]\!]_w \in n, m$

(90) Miss Jones believes that I am Lorenzo's mother. [false in C1]
   'Miss Jones would assent to 'This individual (pointing at Maria) is Lorenzo's mother''
   a. *De re*: $\exists x_n[x_n = I_m \wedge \square S x_n]$
   b. *De dicto*: $\square \exists x_n[x_n = I_m \wedge S x_n]$

No deviation from default resolution licensed in (90). Any QUALITY-justified cover shift would lead to QUANTITY violation:

$\Rightarrow$ Optimal resolution: $\lambda w [\![Lorenzo's\ mother]\!]_w \notin n, m$