Resumptive Fake Indexicals in Irish

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September 9, 2007
Fifth Celtic Linguistics Conference
Pumed Gynhadledd Ieithyddiaeth Geltaidd
Gregynog, Wales
The Irish examples in this talk are from a syntactic database developed and maintained by Jim McCloskey.

Many thanks to Jim for sharing his data and discussing some of these issues. Any remaining errors are my own.
The Issue

- Fake indexicals are indexical (1st or 2nd person) pronouns with bound readings (unexpected).
- Kratzer (2006) argues that fake indexicals provide evidence that pronominal binding is local.
- Irish 1st and 2nd person resumptives are bound pronouns and therefore fake indexicals.
- Irish resumptives are not subject to locality conditions.

★ Fake indexicals always have the form of true indexicals. The strongest possible explanation of this is that there is only one underlying form.
Overview

- Introduce concept of fake indexicals
- Some Irish data
- Introduce theory of resumption and its foundations.

**Resource Sensitivity:**
Natural language is universally resource sensitive.

- Intuitive discussion of the analysis of Irish, including fake indexicals
Fake Indexicals
Fake Indexicals

(1) I’m the only one around here who can take care of my children.

**True indexical interpretation:**
The speaker is the only x around here such that x can take care of the speaker’s children.

**Bound (fake indexical) interpretation:**
The speaker is the only x around here such that x can take care of x’s own children.

Kratzer (2006)
Fake Indexicals

(2) Only you eat what you cook.

**True indexical interpretation:**
The hearer is the only x such that x eats what the hearer cooks.

**Bound (fake indexical) interpretation:**
The hearer is the only x such that x eats what x cooks.
Fake Indexicals

(3) We all think we’re smart.

**True indexical interpretation:**
Each of us thinks that we (all of us) are smart.

**Bound (fake indexical) interpretation:**
Each of us thinks that he/she is smart.

- Compare:

  4. We each/all think we’re the smartest person in the world.
  5. # We’re the smartest person in the world.

⇒ Both **person** and **number** can be ‘irrelevant’.

Rullmann (2004)
Irish Resumptive Fake Indexicals

(1) **sibhse a dtig an fhilíocht libh**
    you aN comes the poetry with-you

    ‘you to whom poetry comes easily’ [POC162, Donegal]

(2) **cuidiú linne a ndearnadh neamart móir inár gcuid léinn**
    help [-FIN] with-us aN was-done neglect great in-our CLASS education

    ‘to help those of us whose education was greatly neglected’ [GNC223, Donegal]

(3) **Is sinne an bheirt ghasúr a-r dhíol tú ár lóistín.**
    COP.PRES we the two boy aN-PAST paid you our lodging

    ‘We are the two boys that you paid our lodging.’ [SHS119, Donegal]

(4) **A Alec, tusa a bhfuil an Béarla aige**
    hey Alec you aN is the English at-him

    ‘Hey, Alec — you that know(s) English’
Kratzer’s Minimal Pronouns

- Kratzer (2006):
  ‘Referential and bound variable pronouns look the same because they are made to look the same by the phonological spell-out component.’

- Bound variable pronouns = Minimal Pronouns

- Minimal Pronouns enter the derivation without a complete set of features.

- Minimal Pronouns receive further features via chains of local agreement relations in the syntax.

  ⇒ Minimal Pronouns end up with the same features as referential pronouns have underlingly.
Kratzer’s Minimal Pronouns

1. Subject verb agreement
2. Agreement between a predicative DP and its subject
3. Agreement between a relative pronoun and its head
4. Subject verb agreement
5. Agreement between a verb and a possessive pronoun in the specifier position of the verb’s direct object.

We are the only people who are taking care of our children.
Kratzer’s Conclusions

- Bound variable pronouns = **Minimal Pronouns**
- Minimal Pronouns enter the derivation without a complete set of features.
- Minimal Pronouns receive further features via chains of local agreement relations in the syntax.
  ➞ Minimal Pronouns end up with the same features as referential pronouns have underlyingly.
Problems

- Kratzer’s theory of Minimal Pronouns does not take morpho-syntax seriously.

- No independent motivation for the existence of certain of the agreement chains

- No morphological realization of some of the putative agreement relations (also cross-linguistically)

- No real motivation for the PF realization of true and fake indexicals as the same element (coincidence/conspiracy)

★ The theory predicts that fake indexicals, as Minimal Pronouns, should be subject to **syntactic locality effects** (Adger 2007).
Fake Indexicals and Locality

- David Adger, talk given at ‘Resumptives at the Interfaces’, Paris 7, 2007: availability of bound readings in island contexts
- Judgements here are as reported by David on his handout for the bound reading
- Complex NP
  1. * Only I heard the rumour that Sue told me.
  2. * I am the only one that heard the rumour that Sue told me.
- Wh-Island
  3. ?? I’m the only one that wondered how I can get home early.
- Coordinate Structure Constraint
  4. * Only I met David early and did my homework.
Fake Indexicals and Locality

• Left Branch Constraint

0. I’m the only one around here who can take care of my children.
   cf. a. * Whose did you see car?
   b. * Who did you see car?

• Complex NP

1’. Only I believed the rumour that Sue told me.
2’. I am the only one that believed the rumour that Sue told me.

• Wh-Island

3’. I’m the only one that wondered how my friends could desert me.
3”’. I’m the only one that wondered where I could smoke.

• Coordinate Structure Constraint

4’. Only I did my homework and met David early.
Irish Resumptive Fake Indexicals


- Irish resumptives are bound variables (McCloskey 1979, 2002, Sells 1984).

- Irish resumptive 1st and 2nd person pronouns:
  - Are bound variables, therefore fake indexicals
  - Are not subject to locality effects
  - Have the same form as non-resumptive indexicals
The Logic of Pronominal Resumption

• Background hypothesis/principle

**Resource Sensitivity:**
Natural language is universally resource-sensitive.

1. McCloskey’s Generalization:
Resumptive pronouns are ordinary pronouns (McCloskey 2002, Asudeh 2004).

2. Consequence of Resource Sensitivity:
The essential problem of resumption is that a resumptive pronoun saturates a semantic argument position that must be left open for successful semantic composition (Asudeh 2004).
The Resource Management Theory of Resumption
Glue Semantics

- Glue Semantics is a type-logical semantics that can be tied to any syntactic formalism that supports a notion of headedness.
- Glue Semantics can be thought of as *categorial semantics without categorial syntax*.
- The independent syntax assumed in Glue Semantics means that the logic of composition is *commutative*, unlike in Categorial Grammar.
Glue Semantics

- Lexically-contributed meaning constructors :=

Meaning language term  \( \mathcal{M} : G \)  Composition language term
- Meaning language := some lambda calculus
  - Model-theoretic
- Composition language := linear logic
  - Proof-theoretic
- Curry Howard Isomorphism between formulas (meanings) and types (proof terms)
- Successful Glue Semantics proof:

\[ \Gamma \vdash \mathcal{M} : G_t \]
Key Glue Proof Rules with Curry-Howard Terms

**Application : Implication Elimination**

\[
\begin{array}{c}
\vdots \\
a : A & f : A \rightarrow B \\
\hline \\
f(a) : B
\end{array}
\]

\[\rightarrow^\varepsilon\]

**Abstraction : Implication Introduction**

\[
\begin{array}{c}
[x : A]^1 \\
\vdots \\
f : B \\
\hline \\
\lambda x. f : A \rightarrow B
\end{array}
\]

\[\rightarrow^\omega_{\text{I},1}\]

**Pairwise Conjunction**

**Substitution : Elimination**

\[
\begin{array}{c}
[x : A]^1 & [y : B]^2 \\
\vdots & \vdots \\
a : A \otimes B & f : C \\
\hline \\
\text{let } a \text{ be } x \otimes y \text{ in } f : C
\end{array}
\]

\[\otimes^\varepsilon_{1,2}\]

**Beta reduction for let:**

let \(a \times b\) be \(x \times y\) in \(f\) \[\Rightarrow^\beta\] \(f[a/x, b/y]\)
Example: *Mary laughed*

1. $mary: \uparrow_{\sigma_e}$
2. $laugh: (\uparrow_{\text{SUBJ}})_{\sigma_e} \rightarrow \uparrow_{\sigma_t}$

1’. $mary: g_{\sigma_e}$
2’. $laugh: g_{\sigma_e} \rightarrow f_{\sigma_t}$

Proof
1. $mary: m$  
   Lex. *Mary*  
2. $laugh: m \rightarrow l$  
   Lex. *laughed*  
3. $laugh(mary): l$  
   E $\rightarrow \circ, 1, 2$

Proof

$mary: m$  
$laugh: m \rightarrow l$

$\frac{\text{Lex. laughed}}{laugh(mary): l \rightarrow \epsilon}$
Example: *Most presidents speak*

1. \( \lambda R \lambda S. \text{most}(R, S) : (v \rightarrow r) \rightarrow \forall X.[(p \rightarrow X) \rightarrow X] \)   Lex. \textit{most}
2. \text{president}^* : v \rightarrow r   Lex. \textit{presidents}
3. \text{speak} : p \rightarrow s   Lex. \textit{speak}

\[
\lambda R \lambda S. \text{most}(R, S) : \\
(v \rightarrow r) \rightarrow \forall X.[(p \rightarrow X) \rightarrow X] \\
\text{president}^* : \\
v \rightarrow r
\]

\[
\lambda S. \text{most}(\text{president}^*, S) : \\
\forall X.[(p \rightarrow X) \rightarrow X] \\
\text{speak} : \\
p \rightarrow s
\]

\[
\text{most}(\text{president}^*, \text{speak}) : s
\]

Example: *Most presidents speak*
Example:

*Most presidents speak at least one language*

1. $\lambda R \lambda S. \text{most}(R, S) : (v_1 \rightarrow r_1) \rightarrow \forall X.[(p \rightarrow X) \rightarrow X]$
2. presidents* : $v_1 \rightarrow r_1$
3. speak : $p \rightarrow l \rightarrow s$
4. $\lambda P \lambda Q. \text{at}-\text{least}-\text{one}(P, Q) : (v_2 \rightarrow r_2) \rightarrow \forall Y.[(l \rightarrow Y) \rightarrow Y]$
5. language : $v_2 \rightarrow r_2$

**Lex. most**

**Lex. presidents**

**Lex. speak**

**Lex. at least one**

**Lex. language**
Pronouns in Glue Semantics

- Variable-free: pronouns are functions on their antecedents (Jacobson 1999, among others)
- Commutative logic of composition allows pronouns to compose directly with their antecedents.
Pronouns in Glue Semantics

1. Joe said he bowls.

- Pronominal meaning constructor:

\[ \lambda z. z \times z : A \rightarrow (A \otimes P) \]

\[
\begin{array}{c}
\begin{array}{c}
joe : \lambda z. z \times z : \\
j \rightarrow (j \otimes p)
\end{array} \\
\hline
joe \times joe : j \otimes p
\end{array}
\]

\[
\begin{array}{c}
\begin{array}{c}
\lambda u \lambda q. \text{say}(u, q) : \\
\quad [x : j]^1 \\
\quad j \rightarrow b \rightarrow s
\end{array} \\
\hline
\lambda q. \text{say}(x, q) : \\
b \rightarrow s
\end{array}
\]

\[
\begin{array}{c}
\begin{array}{c}
\lambda v. \text{bowl}(v) : \\
\quad [y : p]^2 \\
\quad p \rightarrow b
\end{array} \\
\hline
\text{bowl}(y) : \\
b
\end{array}
\]

\[
\begin{array}{c}
\begin{array}{c}
\text{say}(x, \text{bowl}(y)) : s
\end{array} \\
\hline
\text{let} \ joe \times joe \ \text{be} \ x \times y \ \text{in} \ 	ext{say}(x, \text{bowl}(y)) : s
\end{array}
\]

\[
\begin{array}{c}
\begin{array}{c}
\text{say}(\text{joe}, \text{bowl}(\text{joe})) : s
\end{array} \\
\hline
\Rightarrow_\beta
\end{array}
\]
Logical Resource Sensitivity

- Linear logic is a **resource logic**

<table>
<thead>
<tr>
<th>Premise reuse</th>
<th>Classical/Intuitionistic Logic</th>
<th>Linear Logic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$A, A \rightarrow B \vdash B$</td>
<td>$A, A \rightarrow B \vdash B$</td>
</tr>
<tr>
<td></td>
<td>$A, A \rightarrow B \vdash B \land A$</td>
<td>$A, A \rightarrow B \not\vdash B \otimes A$</td>
</tr>
<tr>
<td></td>
<td>Premise $A$ reused, conjoined with conclusion $B$</td>
<td>Premise $A$ is consumed to produce conclusion $B$, no longer available for conjunction with $B$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Premise nonuse</th>
<th>Classical/Intuitionistic Logic</th>
<th>Linear Logic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$A, B \vdash A$</td>
<td>$A, B \not\vdash A$</td>
</tr>
<tr>
<td></td>
<td>Can ignore premise $B$</td>
<td>Cannot ignore premise $B$</td>
</tr>
</tbody>
</table>
Linguistic Resource Sensitivity

• **Resource Sensitivity:**
  Natural language is universally resource sensitive.

• Semantics:
  • The logic of semantic composition is a resource logic.
  • Semantic composition is commutative:
    Functors don’t care what side they find their arguments on.
  • Commutative resource logic = linear logic

• Linguistically motivated goal for meaning construction (proofs):
  \[ \Gamma \vdash \mathcal{M} : G_t \]
The Composition Problem

✓ Who did Mary see?

\[
[\text{who}] = \text{The set of } x \text{'s for which it is true that } __
\]

\[
[\text{did Mary see}] = \text{Mary saw } x
\]

\[
\Rightarrow [\text{who}] ( [\text{did Mary see}] ) = \\
\text{The set of } x \text{'s for which it is true that Mary saw } x
\]

★ Who did Mary see him?

\[
[\text{did Mary see him}] = \text{Mary saw the-antecedent-of-him}
\]

\[
\Rightarrow [\text{who}] ( [\text{did Mary see him}] ) = \\
\text{The set of } x \text{'s for which it is true that Mary saw the-antecedent-of-him  \textbf{Bad meaning!}}
\]
The Composition Problem

(1) Who did Mary see?

\[
\text{who} \quad \forall X.[(w \rightarrow X) \rightarrow X] \\
\text{Mary sees} \quad m \rightarrow w \rightarrow s \\
\text{Mary sees him} \quad w \rightarrow s \quad [s/X] \\
\text{Mary sees him} \quad w \rightarrow (w \otimes p) \\
\text{Mary sees him} \quad s \otimes (w \rightarrow (w \otimes p))
\]

(2) *Who did Mary see him?

\[
\text{who} \quad \forall X.[(w \rightarrow X) \rightarrow X] \\
\text{Mary sees} \quad m \rightarrow w \rightarrow s \\
\text{Mary sees him} \quad w \rightarrow s \quad [s/X] \\
\text{Mary sees him} \quad w \rightarrow (w \otimes p) \\
\text{Mary sees him} \quad s \otimes (w \rightarrow (w \otimes p))
\]
Consequences of Resource Sensitivity

• Apparent cases of resource deficit (not enough to go around) and apparent cases of resource surplus (too much to go around) must somehow be resolved if the target interpretation is well-formed.

• Resumptive pronouns are a case of resource surplus.
  • There must be something that gets rid of the pronoun, thereby licensing it: manager resource
  • Manager resources are lexically specified.
  • Irish: aN
Manager Resources

• A manager resource:

  1. Identifies a pronoun through the anaphoric binding relation between the pronoun and its antecedent.

  2. Removes the pronoun from composition (discharges resource surplus)

• The composition (apart from pronoun removal) is just as if the pronoun had not been there.
Irish
Irish Complementizers

\[ aL \quad C \quad (\uparrow \text{UDF}) = (\uparrow \text{CF}^* \quad \text{GF}) \]

\[ (\rightarrow \text{UDF}) = (\uparrow \text{UDF}) \]

‘Successive-cyclic’ marking

\[ aN \quad C \quad \text{Resumptive binding} \]

(Manager resource)

\[ \text{Ulster} \]
Role of Irish C in Unbounded Dependencies

<table>
<thead>
<tr>
<th>Role Relative to Position</th>
<th>Not bottom</th>
<th>Bottom</th>
<th>Method</th>
<th>Cyclic?</th>
</tr>
</thead>
<tbody>
<tr>
<td>aL</td>
<td>Passing</td>
<td>Grounding</td>
<td>Functional equality</td>
<td>Yes</td>
</tr>
<tr>
<td>aN</td>
<td>Passing</td>
<td>Grounding Resumptive licensing</td>
<td>Anaphoric binding</td>
<td>No</td>
</tr>
</tbody>
</table>

Note:
This is not an ‘agreement-based’ theory of Irish C-marking

The unbounded dependency complementerizers ‘do something’.
Resumptive Fake Indexicals

• The fact that indexicals can be bound indicates simply that indexical reference is not intrinsically built into lexical entries for 1st and 2nd person pronouns.

• Rather, such pronouns have two possible meaningful components:
  1. A pronominal function on an antecedent (bound reading)
  2. A contribution of an indexical reference
     ➔ Indexicals are exceptional in having intrinsic reference/ antecedent.

• I furthermore make the standard assumption that the pronoun must agree with its antecedent.
Pronouns

 sé (‘he’)  \[ \lambda z. z \times z : \text{antecedent} \rightarrow (\text{antecedent} \otimes \text{pronoun}) \]

Bindable only (incl. discourse)

sinne (‘we’)  \[
\{ \text{sum(speaker, others)} : s \mid \\
\lambda z. z \times z : \text{antecedent} \rightarrow (\text{antecedent} \otimes \text{pronoun}) \}
\]

Bindable or
can provide intrinsic reference
Irish Resumptive Fake Indexicals

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‘you to whom poetry comes easily’ [POC162, Donegal]

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hey Alec you aN is the English at-him
‘Hey, Alec — you that know(s) English’
Conclusion

- Irish resumptives are bound pronouns (‘bound variables’).
- Irish resumptives occur in 1st and 2nd person.
- Therefore, Irish has resumptive fake indexicals.
- Resumptive fake indexicals have the ordinary form of indexical pronouns: suggests a unified underlying form (lexical entry), contra Kratzer (2006).
- Resumptive fake indexicals are not clearly subject to locality constraints.
- Kratzer’s theory of Minimal Pronouns must be adjusted if it is to account for non-locality-sensitive resumptive fake indexicals.
Research supported by the
Social Sciences and Humanities Research Council of Canada,
Standard Research Grant 410-2006-1650

http://www.carleton.ca/~asudeh/