Reference Phenomena in Discourse

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1	Referring Expressions
2	Definite and Indefinite Noun Phrases
3	Pronouns and Demonstratives
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Background: Reference is the act of using language to point to an entity (person, object, event, idea). The linguistic form used is a **referring expression**; the thing pointed to is the **referent**; an earlier expression that a later one depends on is the **antecedent**, and the dependent later expression is the **anaphor**. Example: in *'Maria bought a phone. She loved it.'* 'Maria' and 'a phone' introduce referents; 'She' and 'it' are anaphors with antecedents Maria and phone.

Anaphora vs coreference: Coreference = two expressions refer to the *same* real-world entity (symmetric, forms chains). **Anaphora** = an expression whose interpretation depends on an earlier one (directional). Most anaphors are coreferent, but not all: bridging anaphors are anaphoric without being coreferent ('a car ... the engine'), and some coreferent mentions are not anaphoric (two names of the same person).

Topic 1: Referring Expressions

1.1 Definition

A **referring expression** is a linguistic expression (name, noun phrase, pronoun, demonstrative, zero form) that a speaker or writer uses to identify an entity, called the **referent**, for the hearer, by evoking it into, or accessing it in, the shared **discourse model**.

Evoke vs access: an expression that introduces a new entity *evokes* it into the discourse model; one that mentions an already-present entity *accesses* it.

1.2 Characteristics

Type	Examples	Typical use
Proper names	Maria, Hyderabad, Google	Identify unique, known entities
Indefinite NPs	a phone, some students, books	Introduce new entities
Definite NPs	the phone, the company, my sister	Refer to identifiable / known entities
Personal pronouns	he, she, it, they	Refer to highly salient (in focus) entities
Reflexive / possessive	herself, his	Clause-bound or possessor reference
Demonstratives	this, that, these, those, this phone	Point to entities near/far or to discourse segments
Zero anaphora (ellipsis)	'Ravi came and [..] left.' (pro-drop languages: Hindi, Japanese, Spanish)	Entity is so salient no form is needed

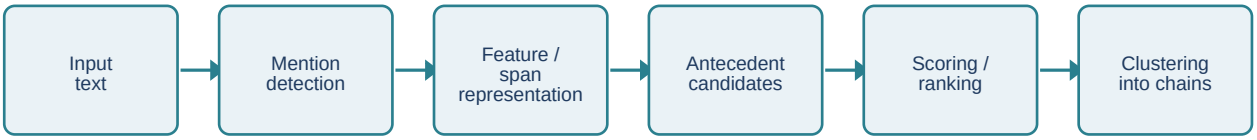
Key properties

- **Context dependent:** the same form ('it') can refer to different entities in different contexts.
- **Form signals cognitive status:** the choice of form reflects how accessible the referent is to the hearer (Givenness Hierarchy, Gundel et al. 1993; Accessibility Theory, Ariel 1990).
- **Constraints:** agreement (gender, number, person), syntactic binding, recency, salience (subject > object > other), parallelism, semantic compatibility, world knowledge.
- **Chains:** all mentions of one entity form a coreference chain (e.g., Maria - She - her).

Givenness Hierarchy (most to least accessible)	Typical form
In focus	it, zero
Activated	this, that, he, she
Familiar	that N
Uniquely identifiable	the N
Referential	indefinite this N
Type identifiable	a N

1.3 Architecture (reference / coreference resolution)

Reference resolution pipeline



Stage	Description
Mention detection	Find all candidate referring expressions (NPs, pronouns, names) using a parser / NER / span model; filter non-referential ones (pleonastic 'it', idioms)
Representation	Hand features (head word, gender, number, distance, grammatical role, string match) or neural span embeddings (BiLSTM / BERT)
Candidate generation	For each mention, previous mentions within a window (plus a dummy 'new entity' option)
Scoring models	**Mention-pair** (is pair coreferent?), **mention-ranking** (pick best antecedent, e.g., Lee et al. 2017 end-to-end span ranking), **entity-based** (compare mention to partial clusters), LLM-based prompting
Clustering	Link decisions are merged by transitivity into coreference chains
Evaluation	MUC, B-cubed, CEAF; CoNLL score = average F1. Dataset: OntoNotes (CoNLL-2012)

1.4 Example, step by step

```
[1] Maria bought a new phone. [2] She loved it, but the screen cracked. [3] Her brother repaired the device.
```

Step	Action	Result
1. Detect mentions	Mark all NPs and pronouns	Maria, a new phone, She, it, the screen, Her, Her brother, the device
2. Classify form	Type of each expression	Maria = proper name; a new phone = indefinite; She, it, Her = pronouns; the screen, the device = definite NPs
3. Evoke or access?	New or already known?	Maria, a new phone: evoke (new). She, it, Her, the device: access (old). the screen: bridging (part of phone)
4. Candidates + filters	Agreement and recency	'She': Maria (F, sg) fits, phone (neuter) fails. 'it': phone fits (neuter), Maria fails. 'Her': Maria. 'the device': hypernym of phone
5. Choose antecedents	Highest salience / similarity	She = Maria; it = a new phone; Her = Maria; the device = a new phone
6. Build chains	Group mentions	Chain A: Maria, She, Her (and Her brother's possessor). Chain B: a new phone, it, the device. 'the screen' linked by bridging to phone, not coreference

1.5 Applications

- **Information extraction and knowledge graphs:** merge all mentions of an entity before extracting facts.
- **Question answering and reading comprehension:** answer 'Who loved the phone?' needs 'She = Maria'.
- **Summarisation:** replace pronouns with names so extracted sentences stay understandable.

- **Machine translation:** choose correct gender / number of pronouns in the target language.
- **Dialogue systems:** track what 'it' or 'that one' refers to across turns.
- **Sentiment analysis:** link opinions to the correct target entity.
- **Entity linking and search:** connect mentions to knowledge base entries.

Topic 2: Definite and Indefinite Noun Phrases

2.1 Definition

Indefinite NP: a noun phrase with a/an, some, a numeral, or a bare plural ('a boy', 'some books') that typically *introduces a new* entity the hearer cannot yet identify.

Definite NP: a noun phrase with 'the', a possessive, a demonstrative or a proper name ('the boy', 'my sister', 'that car') that signals the entity is *identifiable* to the hearer (already mentioned, visible, known, or inferable).

2.2 Characteristics

Feature	Indefinite NP	Definite NP
Marker	a, an, some, any, numerals, bare plurals	the, this/that, possessives (my, his), proper names
Discourse role	Introduces new referent (evokes)	Refers to known referent (accesses), though may be new but unique
Hearer knowledge	Not identifiable yet	Identifiable
Reference type	Specific ('A man called you') or non-specific ('I need a doctor')	Anaphoric, situational, unique, bridging, generic
Antecedent	Usually none (new)	Often has antecedent (same or related head)
Coreference behaviour	Starts a chain	Continues a chain (or starts one if unique)
Other uses	Generic ('A dog barks'), predicative ('She is a teacher'), existential	Generic ('The lion is a predator')

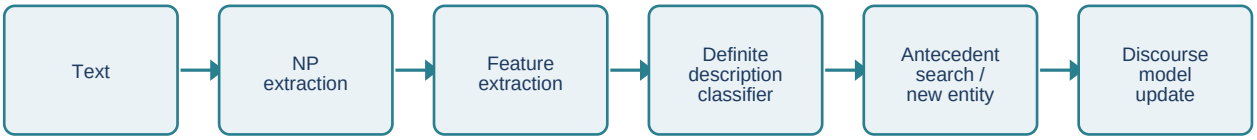
Uses of definite descriptions (Hawkins; Vieira and Poesio):

Use	Meaning	Example
Anaphoric (direct)	Same entity as an earlier mention	'A girl found a wallet. **The girl** returned it.'
Associative / bridging	Related to an earlier entity	'I bought a car. **The engine** is noisy.'
Situational	Identifiable from physical context	'Pass me **the salt**.'
Larger situation / unique	Unique in shared world knowledge	'**The sun** was setting.', 'the Prime Minister'
Cataphoric / with modifier	Identified by following modifier	'**The man who called you** is here.'
Generic	Whole class	'**The tiger** is endangered.'

- **Theories:** *Uniqueness* (Russell: exactly one entity fits) and *familiarity* (Heim: the entity is already in the discourse); modern accounts combine them with identifiability.
- **Not all definites are anaphoric:** corpus studies (Poesio and Vieira 1998) found that roughly half of definite descriptions in news text are discourse-new, so a resolver must first decide *whether* an antecedent exists.
- **Information status** (Prince 1981): new, given/old, inferrable (bridging); definiteness is the surface clue.

2.3 Architecture (definite description processing)

Definite / indefinite NP processing pipeline (after Vieira and Poesio 2000)



Stage	Description
NP extraction	Parse text, extract noun phrases with determiner and head
Features	Determiner type (a / the / this / zero), head noun, pre/post-modifiers, same head seen earlier?, distance to earlier mention, WordNet relations (synonym, hypernym, meronym), unique-noun lists (sun, moon), restrictive modification, position in sentence
Classifier	Decides category: **indefinite (new)**, definite **discourse-new**, definite **anaphoric (direct)**, definite **bridging**. Rule-based, decision tree, SVM or neural
Resolution	Anaphoric: choose antecedent (same head or WordNet-related, most recent / most salient). Bridging: find anchor. New: create new discourse referent
Discourse model update	Add new referents, update salience of mentioned ones

2.4 Example, step by step

```
[1] A girl found a wallet. [2] The girl returned the wallet to the police. [3] The sun was setting.
```

Step	NP	Analysis	Decision
1	A girl	Indefinite; first mention	Evoke new referent d1
2	a wallet	Indefinite; first mention	Evoke new referent d2
3	The girl	Definite; head 'girl' seen before (d1); no contradiction	Anaphoric: = d1
4	the wallet	Definite; head 'wallet' = d2	Anaphoric: = d2
5	the police	Definite; no earlier mention; institution unique in context	Discourse-new (unique / larger situation); evoke d3
6	The sun	Definite; no earlier mention; globally unique noun	Larger-situation definite; new d4

Lesson: a definite article does not guarantee an antecedent. The resolver must distinguish anaphoric ('the girl'), unique/new ('the sun', 'the police') and bridging ('the engine') definites.

2.5 Applications

- **Grammatical error correction / writing assistants:** predict missing or wrong articles (a / the / zero), a major error type for learners whose language lacks articles.
- **Machine translation:** languages like Chinese, Russian and Japanese have no articles; translating into English requires predicting definiteness from discourse.
- **Coreference and discourse modelling:** decide whether to look for an antecedent or start a new entity.

- **Information status for speech synthesis:** new information is stressed, given information de-accented.
- **Summarisation and generation:** introduce entities with indefinites, then refer with definites or pronouns.
- **Knowledge base population:** new indefinite mentions create new entities; definites link to existing ones.

Topic 3: Pronouns and Demonstratives

3.1 Definition

Pronoun: a word that stands in for a noun phrase and gets its meaning from an antecedent or the context (he, she, it, they, himself, his, who).

Demonstrative: a word that points to an entity or segment of discourse with a sense of distance: **this / these** (proximal, near) and **that / those** (distal, far), used as pronouns ('That is wrong') or determiners ('this phone').

3.2 Characteristics

Kind	Examples	Notes
Personal	he, she, it, they, I, you	Mark person, number, gender; refer to salient entities
Reflexive	himself, themselves	Must be bound in the same clause (Binding Principle A)
Possessive	his, her, their	Refer to possessor
Relative	who, which, that	Refer back within an NP
Indefinite	someone, anyone	No specific antecedent
Demonstrative pronoun / determiner	this, that, these, those	Proximal vs distal; may refer to NPs or to events and propositions
Pleonastic (expletive)	'**It** is raining.' '**It** is clear that...'	Not referential; must be filtered out
Cataphora	'When **he** arrived, **Ravi** was tired.'	Pronoun precedes its referent

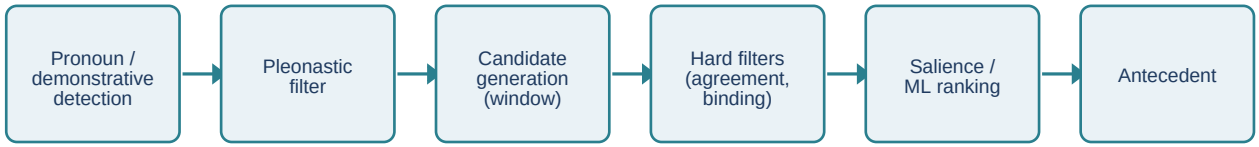
Factors guiding pronoun resolution

Factor	Explanation	Example
Agreement	Gender, number, person must match	'Priya met Rahul. She...' -> Priya
Binding (syntax)	Pronoun cannot corefer with a subject in its own clause (Principle B); reflexive must	'Rahul shaved him' (him != Rahul)
Recency	Nearer antecedents preferred	Latest sentence first
Salience / grammatical role	Subject > object > others	'Ravi gave Bill a pen. He smiled.' -> Ravi (preferred)
Parallelism	Same role as in previous clause	'Ravi hit Bill and Tom kicked him.' -> Bill
Selectional restrictions	Verb requires certain type of argument	'Priya ate it' -> edible thing
Verb causality / world knowledge	Verb biases the explanation	'Ravi blamed Bill because **he** was careless.' -> Bill; Winograd schemas

Demonstratives: proximal 'this' is used for the current or upcoming focus and new topics; distal 'that' for entities farther away in space, time or the preceding discourse. Demonstratives, especially 'this' and 'that' alone, often show **discourse deixis**: they refer to a clause, event, fact or whole stretch of text ('The government cut fuel prices. **That** surprised analysts.'). These abstract referents are harder than NP antecedents.

3.3 Architecture

Pronoun resolution pipeline



Algorithm / model	How it works
Hobbs' naive algorithm (1978)	Traverses the parse tree in a fixed left-to-right, breadth-first order, starting at the pronoun, proposing the first NP that passes agreement (no semantics, about 80-90 percent on simple text)
Lappin and Leass RAP (1994)	Filters candidates by agreement and binding, then ranks by salience weights: sentence recency 100, subject 80, existential 70, direct object 50, indirect object / oblique 40, head noun 80, non-adverbial 50; weights halve with each sentence
Centering-based	Choose the antecedent that gives the most coherent Cb transition (Continue > Retain > Smooth-shift > Rough-shift)
Mention-ranking neural	Span embeddings + feed-forward scorer over all earlier mentions; trained end-to-end (Lee et al. 2017); BERT-based versions are state of the art
Demonstrative / abstract anaphora	Candidate set includes clauses and sentences; classify the referent type (NP vs event vs fact) using verb selectional restrictions, then choose the best segment

3.4 Example, step by step

Part A - Pronouns with RAP-style salience.

```
[S1] Priya met Rahul at the station. [S2] She gave him a gift. [S3] It was a watch.
```

Step	Pronoun	Candidates	Filtering and ranking	Result
1	She (S2)	Priya (F), Rahul (M), station (n)	Agreement removes Rahul and station	Priya
2	him (S2)	Priya, Rahul, station	Binding: 'him' cannot be the clause subject 'She' = Priya; agreement removes station	Rahul
3	It (S3)	gift, station, Priya, Rahul	Agreement (non-human) leaves gift, station. Salience: gift = 100 + 50 (object) + 80 (head) + 50 = 280, halved to 140 in S3; station = 100 + 80 = 180 halved twice = 45	gift

Part B - Demonstrative (discourse deixis). 'The government cut fuel prices. That surprised analysts.'

- **Step 1:** 'That' is a demonstrative pronoun (distal) in subject position of 'surprised'.
- **Step 2:** Candidate referents: the NP 'fuel prices' (concrete) and the clause 'The government cut fuel prices' (event).
- **Step 3:** Selectional restriction: 'surprised analysts' needs an event or fact as subject, not a price list; the clause fits better.
- **Step 4:** Resolve 'That' = the event of cutting fuel prices (abstract anaphora).

3.5 Applications

- **Machine translation:** languages differ in gender / pro-drop; correct pronoun choice needs resolution.

- **Dialogue systems and voice assistants:** 'Play that again', 'Book it for tomorrow'.
- **Question answering and reading comprehension:** multi-sentence reasoning with pronouns (e.g., Winograd Schema Challenge, GAP dataset).
- **Summarisation:** avoid unresolved pronouns in extracted summary sentences.
- **Information extraction:** assign facts to the right person or organisation.
- **Gender-bias analysis:** detect biased pronoun resolution in language models.
- **Accessibility and text simplification:** replace ambiguous pronouns by explicit nouns.

Topic 4: Bridging References

4.1 Definition

A **bridging reference** (associative or indirect anaphor) is a definite (or otherwise identifiable) expression that does *not* corefer with an earlier mention but is understood through an **inferable link**, such as part-of or ownership, to an earlier entity, the **anchor** (antecedent). Example: 'I bought a **car**. **The engine** is noisy.' The engine is not the car, but it is the car's engine.

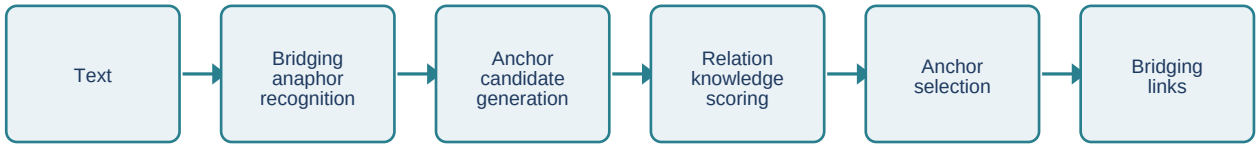
4.2 Characteristics

- **Non-identity:** anaphor and anchor are different entities (unlike coreference).
- **Inference needed:** uses world and lexical knowledge (a car has an engine); no explicit cue in the text.
- **Form:** usually a definite NP ('the engine'), sometimes a possessive or relational NP ('the price', 'the author').
- **Anchor:** usually a nearby NP, but may be an event or the topic of the paragraph.
- **Information status:** 'inferrable' / 'accessible' (Prince 1981; ISNotes, ARRAU and BASHI corpora).
- **Hard to annotate:** boundaries with coreference, discourse-new and generic are fuzzy; annotator agreement is only moderate.
- **Sparse:** bridging forms a small share of all mentions, so data is limited.

Relation type (Clark 1975 and later)	Example (anchor -> bridging anaphor)
Part-whole / necessary part	a house -> the roof; a book -> the cover
Set membership / organisation	a hotel -> the staff; a school -> the teachers
Relational / role	a company -> the CEO; a film -> the director
Attribute / possession	a laptop -> the price; a city -> the population
Event-role	'He was murdered.' -> the killer; a wedding -> the bride
Cause / reason / consequence	'The bridge collapsed.' -> the damage
Set-subset (comparative)	'Some students passed.' -> the others / the rest
Location	'We visited Goa.' -> the beaches

4.3 Architecture

Bridging resolution pipeline (two-step)



Stage	Description
Anaphor recognition	Is this definite NP a bridging anaphor (not coreferent, not discourse-new, not generic)? Rules (Hou et al. 2014) or classifier using determiner, head, no earlier same-head mention, relational noun lists
Candidate generation	Take NPs from a window (current and 1-2 previous sentences) plus the first-mentioned / topical entities of the document
Knowledge sources	WordNet / ConceptNet part-of and member-of relations; Hearst-style patterns ('the X of Y') mined from large corpora; word embeddings (e.g., PP-specific embeddings); pretrained language models (BERT); frequency of 'the N of anchor' strings on the web
Scoring and selection	Rank candidate anchors by semantic relatedness, distance and salience; neural versions treat it like question answering ('what is the engine part of?')
Output / evaluation	(anaphor, anchor) pairs; precision / recall / F1 on anaphor recognition and full resolution (low, about 20-50 F1 on ISNotes-style data, so very much an open problem)

4.4 Example, step by step

```
[1] I visited a hotel in Goa. [2] The rooms were spacious and the staff were friendly.
[3] The beach was close.
```

Step	Action	Result
1. Find definites	List definite NPs	the rooms, the staff, the beach
2. Check coreference	Any earlier mention with same / related head?	None for 'rooms', 'staff', 'beach' -> not anaphoric (direct)
3. Not unique/generic?	Is the noun globally unique like 'the sun'?	No -> likely bridging anaphors, not 'larger situation'
4. Candidate anchors	Earlier NPs in window	a hotel, Goa, I
5. Score relations	Knowledge: part-of / member-of / located-in	hotel-rooms: part-of (0.92); hotel-staff: member-of (0.88); Goa-beach: located-in (0.90); hotel-beach: low (0.30) (illustrative scores)
6. Select anchors	Highest score per anaphor	rooms -> hotel; staff -> hotel; beach -> Goa
7. Output	Bridging links	(the rooms, a hotel, part-of), (the staff, a hotel, member-of), (the beach, Goa, located-in)

4.5 Applications

- **Coherence modelling:** bridging links add entity connections, improving entity-grid and discourse-structure analysis.
- **Question answering and machine reading:** 'Who is the CEO?' after a company is mentioned.
- **Information extraction and KB population:** extract part-of, member-of and attribute relations.

- **Summarisation:** keep anchors with their bridged mentions so summaries are understandable.
- **Machine translation:** decide definiteness and possessives in the target language.
- **Information status for speech synthesis:** inferrable entities are less stressed than new ones.
- **Dialogue understanding:** 'Book a table. Is the menu vegetarian?' (menu of the restaurant).

Topic 5: Exophoric vs Endophoric References

5.1 Definition

Endophoric reference (Halliday and Hasan 1976): the referent is identified *within the text* itself. It creates textual cohesion. Includes **anaphora** (refers back) and **cataphora** (refers forward).

Exophoric reference: the referent lies *outside the text*, in the physical situation, the participants, or shared world knowledge, and must be recovered from context (deixis, pointing, homophoric reference).

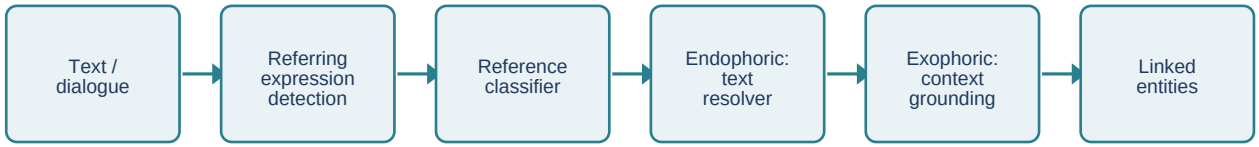
5.2 Characteristics

Feature	Endophoric	Exophoric
Referent location	Inside the text / discourse	Outside: situation, speaker/hearer, world
Subtypes	Anaphoric (back), cataphoric (forward), esphoric (within the same NP: 'the man **who came**')	Deictic (person, place, time), situational, homophoric (culturally shared: 'the sun', 'the government')
Cohesive?	Yes, ties parts of the text together	No textual tie; links text to context
Resolution needs	Preceding or following text	Speaker, time, place, visual scene, shared knowledge
Typical forms	he, she, it, the girl, such, one, that (text)	I, you, here, now, today, this (pointing), that book (in the room)
Typical genre	Written text, narrative, articles	Spoken dialogue, instructions, signs, captions, chat
Examples	'Ravi came late. **He** apologised.' (anaphora); 'Before **he** spoke, **Ravi** paused.' (cataphora)	'**I** will see **you tomorrow**.' 'Look at **that**!' 'Put it **there**.'

- **Deixis types:** person (I, you), place (here, there), time (now, yesterday), discourse (this paragraph), social (formal / informal 'you').
- **Deictic centre:** exophoric forms are interpreted relative to the speaker, time and place of utterance ('now' in a letter written yesterday).
- **Homophoric reference:** the referent is unique in the shared culture and needs no antecedent ('The Prime Minister said...').
- **A given word can be either:** 'that' may point to an object in the room (exophoric) or to a previous sentence (endophoric).

5.3 Architecture

Endophoric / exophoric reference pipeline



Stage	Description
Detection	Find pronouns, deictic words, definite NPs, demonstratives
Reference classifier	Classify each expression as **endophoric** (anaphoric / cataphoric), **exophoric** (deictic, situational, homophoric), **generic** or **pleonastic**, using features: form, presence of antecedent candidates, tense/person, genre (dialogue vs text), proximity words
Endophoric resolver	Coreference / pronoun / bridging resolvers over the text (Topics 1-4)
Exophoric grounding	**Person / time / place deixis:** map I/you to speaker and addressee, now/yesterday to the utterance date, here to the location from metadata. **Situational reference:** multimodal grounding of 'that cup' to an object in an image or video (referring expression comprehension). **Homophoric:** entity linking to a knowledge base
Output	Links from expressions to textual antecedents (endophoric) or to external entities / scene objects / speaker roles (exophoric)

5.4 Example, step by step

```
A (pointing at a shelf): Can you pass that book? B: Which one? A: The red one on the left.
B: Here. A: Thanks. I read it yesterday.
```

Expression	Type	Reasoning and referent
Can **you**	Exophoric (person deixis)	Addressee of the utterance = speaker B
that book	Exophoric (situational)	Identified by A's pointing gesture at the shelf; no prior text mention
Which **one**	Endophoric (substitution)	'one' stands for 'book' mentioned earlier in the dialogue
The red one on the left	Exophoric (situational) + endophoric 'one'	Description picks out an object in the visible scene; 'one' = book
Here	Exophoric (place deixis)	The location where B hands the book over
I	Exophoric (person deixis)	Speaker A
it	Endophoric (anaphora)	Antecedent 'that book' / 'the red one'
yesterday	Exophoric (time deixis)	Day before the utterance date, from conversation metadata

Steps summary: (1) list referring expressions; (2) check whether a suitable antecedent exists in the text; (3) if yes, label endophoric and resolve in text; (4) if not, check for deictic / situational / homophoric use; (5) ground exophoric forms using speaker roles, time, location, image or knowledge base.

5.5 Applications

- **Dialogue systems and voice assistants:** resolve 'you', 'here', 'tomorrow' and 'that one' using user and device context.

- **Embodied AI and robotics:** 'Bring me that cup' needs visual grounding of exophoric references.
- **Vision-language tasks:** referring expression comprehension and visual question answering.
- **Meeting and chat summarisation:** replace I/you/we and relative times with names and dates.
- **Machine translation:** deixis (honorifics, 'here/there', pronoun person) differs across languages.
- **Discourse and readability analysis:** measure cohesion by counting endophoric ties; assess genre (spoken vs written).
- **Temporal information extraction:** normalise 'yesterday', 'next week' using the document date.

Topic 6: Summary and Exam Questions

6.1 Comparison of the five topics

	Referring expr.	Def. / indef. NP	Pronoun / demonstr.	Bridging	Exo / endophoric
Core idea	Form used to point to an entity	Identifiability of referent	Substitute / pointing words	Inferred link to anchor	Referent inside vs outside text
Key notion	Referent, antecedent, chain	New vs given	Agreement, salience, binding	Anchor, world knowledge	Deixis, cohesion
Key methods	Mention-ranking coreference	Definite description classifier	Hobbs, RAP, neural	Relation knowledge + ranking	Reference classifier + grounding
Main difficulty	Long chains, noise	Discourse-new vs anaphoric	Ambiguity, commonsense	Sparse, implicit, subjective	Needs multimodal context
Top use	IE, QA, summarisation	Article prediction, MT	MT, dialogue, QA	Coherence, QA	Dialogue, robotics

6.2 Likely exam questions

1. Define referring expression, referent, antecedent, anaphora and coreference. Describe the types of referring expressions.
2. Explain the Givenness Hierarchy and describe the architecture of a coreference resolution system.
3. Differentiate definite and indefinite noun phrases. Explain the uses of definite descriptions with examples.
4. Explain the factors that govern pronoun resolution. Describe Hobbs' algorithm or the Lappin and Leass algorithm with an example.
5. What are demonstratives and discourse deixis? How are abstract anaphors resolved?
6. What is a bridging reference? Explain its types and how a bridging resolver works.
7. Differentiate exophoric and endophoric reference with examples. Explain anaphora, cataphora and deixis.
8. List applications of reference resolution in NLP.

Note on figures: corpus statistics and score ranges (for example the share of discourse-new definites, bridging resolution F1, Hobbs' accuracy) are quoted from the standard literature as I recall it and are approximate. Check them against your textbook or papers before quoting them in an exam. The salience scores in the pronoun and bridging examples are worked or illustrative values.