

Sentence Processing I

Nick Riches

Newcastle University

March 27, 2019

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 1 / 57

Bottom-up versus top-down models

Evidence for bottom up processing

Evidence for top-down processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

Bottom-up versus top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 1 / 57

THE CAT

Figure 5: Context influences perception



Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 2 / 57

Bottom-up models

Sentence
Processing I

Nick Riches

Bottom up = analysis based on word classes

(1) The...

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up models

Sentence
Processing I

Nick Riches

Bottom up = analysis based on word classes

(1) The... woman lost her purse

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up models

Bottom up = analysis based on word classes

(1) The... woman lost her purse

Top down = analysis based on lexical/contextual factors /
plausibility

(2) She's just popped out to the...

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up models

Bottom up = analysis based on word classes

(1) The... woman lost her purse

Top down = analysis based on lexical/contextual factors /
plausibility

(2) She's just popped out to the... shops

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up models

Bottom up = analysis based on word classes

(1) The... woman lost her purse

Top down = analysis based on lexical/contextual factors /
plausibility

(2) She's just popped out to the... shops

(3) The disgruntled accountant decided to hand in
his...

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up models

Bottom up = analysis based on word classes

(1) The... woman lost her purse

Top down = analysis based on lexical/contextual factors /
plausibility

(2) She's just popped out to the... shops

(3) The disgruntled accountant decided to hand in
his... notice

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up models

Bottom up = analysis based on word classes

(1) The... woman lost her purse

Top down = analysis based on lexical/contextual factors /
plausibility

(2) She's just popped out to the... shops

(3) The disgruntled accountant decided to hand in
his... notice

(4) I'm going to give...

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up models

Bottom up = analysis based on word classes

(1) The... woman lost her purse

Top down = analysis based on lexical/contextual factors /
plausibility

(2) She's just popped out to the... shops

(3) The disgruntled accountant decided to hand in
his... notice

(4) I'm going to give... it some thought

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up versus top-down models

Evidence for bottom up processing

Evidence for top-down processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 3 / 57

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 4 / 57

Since

Garden path sentence

Jay

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 5 / 57

Garden path sentence

always

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 6 / 57

Garden path sentence

jogs

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 7 / 57

Garden path sentence

a

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 8 / 57

Garden path sentence

mile

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 9 / 57

Garden path sentence

and

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 10 / 57

Garden path sentence

a

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 11 / 57

Garden path sentence

half

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 12 / 57

Garden path sentence

seems

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 13 / 57

Garden path sentence

a

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 14 / 57

Garden path sentence

long

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 15 / 57

Garden path sentence

way

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 16 / 57

Garden path sentence

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 17 / 57

to

Garden path sentence

him

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 18 / 57

The garden path model

(5) [**CLAUSE** Since Jay always jogs a mile and a half]

Od. of 'jogs'

(6) [**CLAUSE** Since Jay always jogs] [**CLAUSE** a mile and a half seems a long way to him]

S of 'seems'

The garden path model

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 20 / 57

Temporary mis-analysis of the structure of a sentence.

We are relatively slow to recover.

Easy to generate and near universal.

The garden path model

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography

(7) The criminal confessed his sins harmed many people

The garden path model

(8) [**CLAUSE** The criminal confessed **his sins**]

Od. of 'confessed'

(9) [The criminal confessed [**CLAUSE** **his sins** harmed many people]]

S of 'harmed'

The garden path model

Sentence
Processing I

Nick Riches

Garden paths allow us to see the inbuilt biases of the **parser**
(parse = analyse a sentence and tag each word according to
its word class)

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 23 / 57

Arises where there are two possible analyses.

Can be **local** (ambiguity resolved before the end of the sentence), or **global** (ambiguity remains even after we have read/hear entire sentence)

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 24 / 57

EXERCISE

Where is the ambiguity in these sentences? Is it local or global?

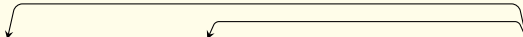
- (10) The vampires loaned money at low interest rates were told to record their expenses
- (11) XXX pleaded guilty to running the brothel at Newcastle Crown Court.
- (12) The young athlete realised her potential might one day make her a world class athlete
- (13) A bicycle was reported stolen by an old lady
- (14) They're cooking apples.
- (15) The following are some tips to protect women from the police department

EXERCISE

(16) The vampires (that were) loaned money at low interest rates were told to record their expenses

(17)

XXX pleaded guilty to running the brothel at Newcastle Crown court



EXERCISE

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

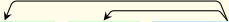
Homework

Bibliography 27 / 57

(18) [**CLAUSE** The athlete realised her potential]

(19) The athlete realised [**CLAUSE** her potential might
one day make her a world class athlete]

(20) A bicycle was **reported** **stolen** **by an old lady**



The diagram illustrates top-down processing in sentence (20). Two arrows originate from the phrase 'by an old lady' (highlighted in blue) and point back to the words 'reported' and 'stolen' (highlighted in green), indicating that the context influences the interpretation of these words.

How do we explain parsing biases?

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 28 / 57

A drive towards **simplicity**?

Innate behaviour of the parser? (Frazier & Fodor, 1978,
'The Sausage Machine')

Processing constraints?

How do we explain parsing biases?

Sentence
Processing I

Nick Riches

Modularity (Jerry Fodor, 1983)

Neural regions dedicated to a particular task

The syntactic parser is dedicated to analysing sentences



Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

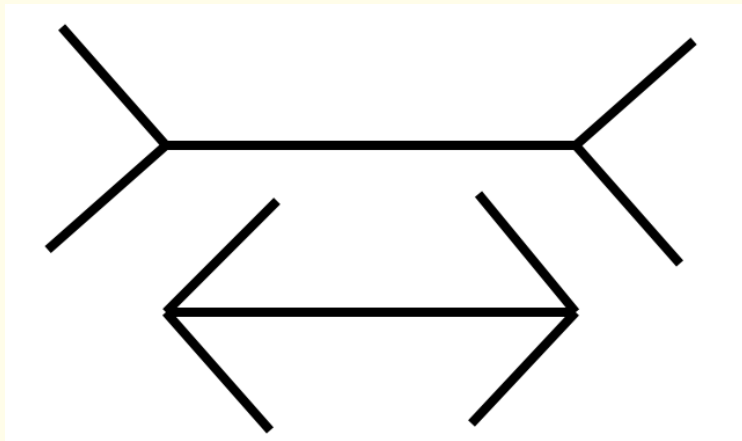
So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 29 / 57

How do we explain parsing biases?



Behaviour of a module is impervious to external information

Is behaviour of parser impervious to top-down information?

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 30 / 57

How do we explain parsing biases?

Assume **local relationships**

(21) A bicycle was reported stolen by an old lady

A diagram illustrating a local relationship in the sentence "A bicycle was reported stolen by an old lady". A green box labeled "local" is positioned above the words "reported" and "stolen". Two arrows originate from the "local" box: one points down to "reported" and the other points down to "stolen". The words "reported" and "stolen" are highlighted with green backgrounds. The phrase "by an old lady" is highlighted with a blue background.

(22) Vlad figured x that Boris wanted to take x the pet rat out

A diagram illustrating a local relationship in the sentence "Vlad figured x that Boris wanted to take x the pet rat out". A green box labeled "local" is positioned above the words "take" and "out". Two arrows originate from the "local" box: one points down to "take" and the other points down to "out". The words "take" and "out" are highlighted with green backgrounds. The word "x" is highlighted with a green background. The phrase "the pet rat" is highlighted with a blue background.

How do we explain parsing biases?

Bottom-up versus top-down models

Bottom-up models

Evidence for bottom up processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for top-down processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

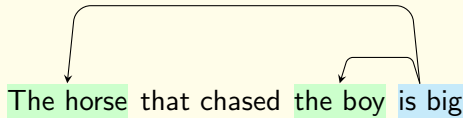
So which account is correct?

Sentence processing in clinical populations

Homework

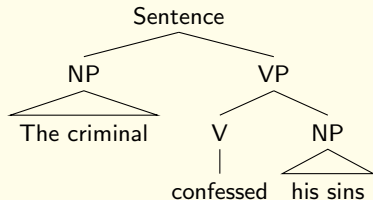
Bibliography

(23)



How do we explain parsing biases?

Assume **simple structures** (e.g. few nodes and branches)



Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

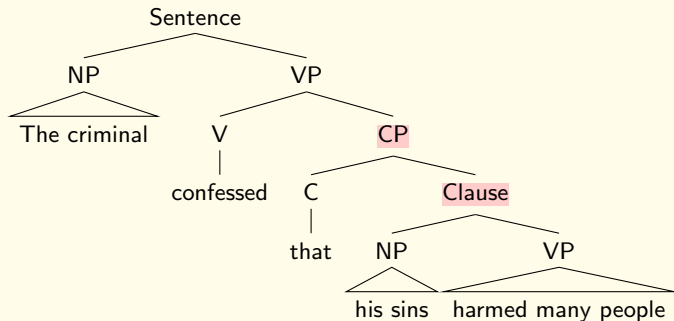
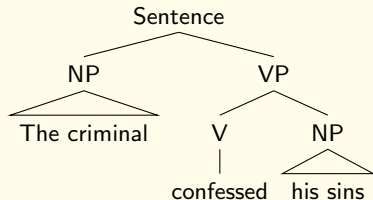
Sentence
processing in
clinical populations

Homework

Bibliography 33 / 57

How do we explain parsing biases?

Assume **simple structures** (e.g. few nodes and branches)



Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

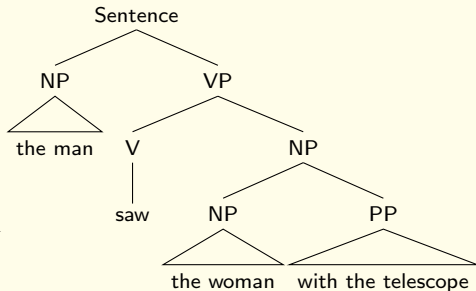
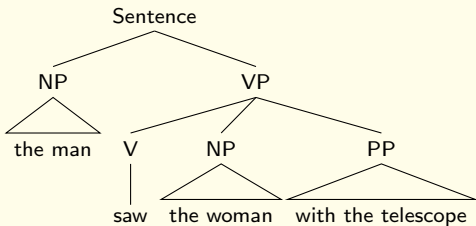
Bibliography 33 / 57

How do we explain parsing biases?

INSTRUMENT



POSSESSION



How do we explain parsing biases?

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography

Alternative: Biases reflect **statistical patterns** in the input

- (24) Vampires (who were) loaned money at low interest rates. . .

Bottom-up versus top-down models

Evidence for bottom up processing

Evidence for top-down processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography

What factors can be classified as “top down”

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as “top down”

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 36 / 57

When referring to top-down processing we are typically referring to

1. Lexical factors
2. Contextual factors

Words clearly bias structural interpretation:

1. The man hit the woman with the _____
2. The boy tempted the mouse with the _____
3. The protestor splattered the policeman with _____
4. The boy likes the girl with _____
5. The young athlete **realised/thought** her potential might one day make her a world class athlete

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 37 / 57

Trueswell et al. (1983) - measured reading via a self-paced reading paradigm.

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 38 / 57

The

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 39 / 57

Bottom-up versus top-down models

Bottom-up models

Evidence for bottom up processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for top-down processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

student

forgot

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 41 / 57

the

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 42 / 57

Bottom-up versus top-down models

Bottom-up models

Evidence for bottom up processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for top-down processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

solution

was

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 44 / 57

Role of lexical content

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 45 / 57

in

the

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 46 / 57

Bottom-up versus top-down models

Bottom-up models

Evidence for bottom up processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for top-down processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

book

Role of lexical content

Sentence
Processing I

Nick Riches

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 48 / 57

(25) I forgot $\left\{ \begin{array}{l} \textit{Janet's birthday} \\ \textit{that it was Janet's birthday} \end{array} \right\}$

(26) I hope $\{ \textit{I will remember next time} \}$

Role of lexical content

Sentence
Processing I

Nick Riches

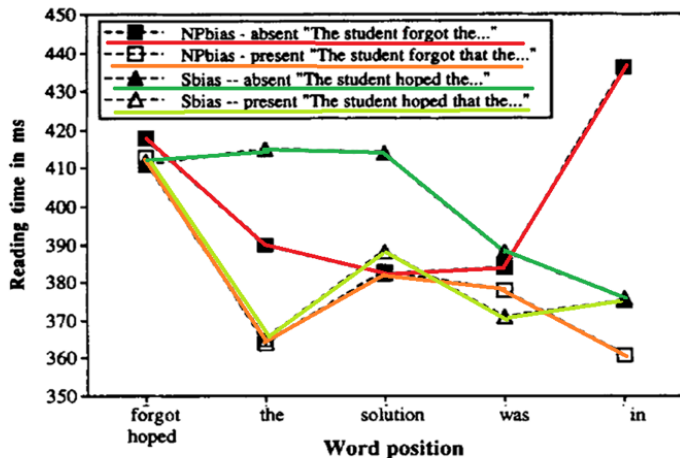


Figure 2. Word-by-word self-paced reading times (in ms). (NP = noun phrase; S = sentence.)

88

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 49 / 57

1. Participants used the verb to predict the structure of the sentence.
2. Participants used subordinator *that* to disambiguate structure.

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 50 / 57

Can you understand this sentence?

(27) The horse raced past the barn fell

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 51 / 57

Now let's put it in context. . .

Lord Chumley-Worthington wanted to map out a race course around his estate. He therefore wanted to find out if the ground was more slippery next to the barn or next to the pond. So he instructed his servants to race two horses along these different routes. **The horse raced past the barn fell,** while the horse raced past the pond managed to stay on its feet. He therefore concluded that the ground next to the barn was more slippery.

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

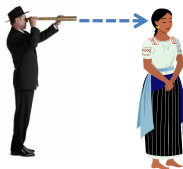
Homework

Bibliography 52 / 57

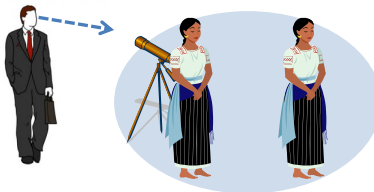
Referential processing

According to theories of referential processing, set-restriction is a costly process.

1. The vampires loaned money at low interest rates were told to record their expenses
2. The man saw the woman with the binoculars



INSTRUMENT



POSSESSION

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 53 / 57

Bottom-up versus top-down models

Evidence for bottom up processing

Evidence for top-down processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography

Garden paths are easy to generate under laboratory conditions

However, top down effects have been repeatedly demonstrated.

1. Both bottom-up and top-down factors are operative at once.
2. Bottom-up processing slightly precedes top-down processing.

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 54 / 57

Bottom-up versus top-down models

Evidence for bottom up processing

Evidence for top-down processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 55 / 57

There is some evidence that language-impaired children may prioritise top-down factors, e.g. animacy.

(28) The rock that the boy dropped was heavy

Bottom-up versus top-down models

Evidence for bottom up processing

Evidence for top-down processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography

Read the following sentence

"No head injury is too trivial to ignore"

Does it make sense to you? Can you paraphrase it? Is there anything weird about it?

Bottom-up versus top-down models

Evidence for bottom up processing

Evidence for top-down processing

So which account is correct?

Sentence processing in clinical populations

Homework

Bibliography

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?

Evidence for
top-down
processing

What factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?

Sentence
processing in
clinical populations

Homework

Bibliography 56 / 57

Bottom-up versus
top-down models

Bottom-up models

Evidence for
bottom up
processing

Garden path sentence

The garden path model

Ambiguity

EXERCISE

How do we explain parsing
biases?Evidence for
top-down
processingWhat factors can be
classified as "top down"

Role of lexical content

Discourse context

Referential processing

So which account
is correct?Sentence
processing in
clinical populations

Homework

Fodor, J. D. (1983). The Modularity of Mind.

Frazier, L., & Fodor, J. D. (1978). The sausage machine: A new two stage parsing model. *Cognition*, 6, 1-34.

Trueswell, J. C., Tanenhaus, M. K., & Kello, C. (1993).
Verb-specific constraints in sentence processing: Separating
effects of lexical preference from garden-paths. *JOURNAL
OF EXPERIMENTAL PSYCHOLOGY LEARNING
MEMORY AND COGNITION*, 19, 528-528.