



Universiteit
Leiden
The Netherlands

Tapping into semantic recovery : an event-related potential study on the processing of gapping and stripping

Ruijgrok, B.J.

Citation

Ruijgrok, B. J. (2018, May 31). *Tapping into semantic recovery : an event-related potential study on the processing of gapping and stripping*. LOT dissertation series. LOT, Netherlands Graduate School of Linguistics, Utrecht. Retrieved from <https://hdl.handle.net/1887/62457>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/62457>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/62457> holds various files of this Leiden University dissertation

Author: Ruijgrok, Bobby

Title: Tapping into semantic recovery : an event-related potential study on the processing of gapping and stripping

Date: 2018-05-31

Tapping into semantic recovery
An event-related potential study
on the processing of Gapping and Stripping

Published by
LOT
Trans 10
3512 JK Utrecht
The Netherlands

phone: +31 30 253 6111
e-mail: lot@uu.nl
<http://www.lotschool.nl>

Cover illustration: Trunks, by Esther Truijen

ISBN: 978-94-6093-289-2
NUR: 616

Copyright © 2018 Bobby Johan Ruijgrok. All rights reserved.

Tapping into semantic recovery
An event-related potential study
on the processing of Gapping and Stripping

Proefschrift

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof. mr. C.J.J.M. Stolker,
volgens besluit van het College voor Promoties
te verdedigen op donderdag 31 mei 2018
klokke 16:15 uur

door

Bobby Johan Ruijgrok

geboren 9 december 1972
te Leiden, Nederland

Promotores: prof. dr. N.O. Schiller
prof. dr. L.L.-S. Cheng
Co-promotor: dr. C.L.J.M. Cremers

Promotiecommissie: prof. dr. L. Frazier (Amherst University)
prof. dr. J. Grijzenhout (secretaris)
dr. L. Pablos Robles
prof. dr. F.N.K. Wijnen (Utrecht University)

The beautiful lull
The dangerous tug
We get to feel small
From high up above
And after a glimpse
Over the top
The rest of the world
Becomes a gift shop

[Downie, Fay, Langlois, Baker, and Sinclair (1996)]

Contents

Acknowledgements	xi
Abbreviations	xiii
1 Introduction	1
1.1 The nature of this study	1
1.2 Interpretation of elided structures: some basic concepts	1
1.3 Levels of analysis: grammar, processing and neurons	3
1.3.1 Grammatical levels of analysis	5
1.3.2 Sentence processing	8
1.3.3 Event-related brain potentials	11
1.4 Outline of this dissertation	13
2 Theoretical background of Gapping and Stripping	17
2.1 Objectives of theoretical ellipsis research	18
2.2 Diagnosing Gapping and Stripping	19
2.3 Surface versus deep	23
2.4 Approaches to the representation and derivation of ellipsis	25
2.4.1 Syntax-oriented accounts	25
2.4.2 Semantics-oriented accounts	31
2.5 Parallelism, identity and focus	39
2.6 Mapping to processing	44
2.7 Summary and conclusions	46
3 Experimental background of Gapping and Stripping	49
3.1 Objectives and methods of experimental ellipsis research	50
3.2 Surface versus deep	52
3.3 Parsing strategies of ellipsis resolution	54
3.4 Prosody	59
3.5 Electrophysiological research on ellipsis	60
3.6 Summary and conclusions	68

4	Setting the stage	69
4.1	Bridging theoretical and experimental research	70
4.1.1	Introduction	70
4.1.2	What is at stake?	71
4.1.3	Methods of measurement	71
4.1.4	Towards a unified research program	76
4.1.5	Conclusion	78
4.2	Working memory load	78
4.2.1	A model of working memory	79
4.2.2	Working memory and sentence comprehension	79
4.2.3	Testing working memory	81
4.3	Hypotheses and possible results	82
5	Replication and norming stimuli	85
5.1	Validating ERP results: a replication study	86
5.1.1	Method	86
5.1.2	Behavioural results	89
5.1.3	Electrophysiological results	90
5.1.4	Discussion	92
5.1.5	Conclusion	94
5.2	Norming stimuli I: acceptability of structural elision	96
5.2.1	Purpose	96
5.2.2	Method	96
5.2.3	Results	100
5.2.4	Discussion	101
5.2.5	Conclusion	102
5.3	Norming stimuli II: acceptability of quantifiers	102
5.3.1	Purpose	102
5.3.2	Method	102
5.3.3	Results	104
5.3.4	Discussion	105
5.3.5	Conclusion	105
6	ERP experiments I & II: Structural complexity	107
6.1	Modulation of structure in the right conjunct	108
6.1.1	Introduction	108
6.1.2	Methods	108
6.1.3	Behavioural results	111
6.1.4	Electrophysiological results	112
6.1.5	Towards an alternative measure point	112
6.1.6	Discussion and conclusion	117
6.2	Modulation of structure in the left conjunct	119
6.2.1	Introduction	119
6.2.2	Methods	120
6.2.3	Behavioural results	122

6.2.4	Electrophysiological results	123
6.2.5	Discussion	125
6.3	Conclusion	131
7	ERP experiment III: Semantic complexity	133
7.1	Introduction	134
7.2	Methods	134
7.3	Behavioural results	137
7.4	Electrophysiological results	138
7.4.1	Relation between working memory and ERPs	139
7.4.2	Relation between sentence comprehension and ERPs	143
7.5	Discussion	147
7.6	Conclusion	148
8	ERP experiment IV: Prosodic cues	151
8.1	Introduction	152
8.2	Methods	153
8.3	Behavioural results	157
8.4	Electrophysiological results	158
8.5	Discussion	159
8.6	Conclusion	162
9	Conclusions and future prospects	165
9.1	Connecting conclusions	165
9.2	Limitations and future prospects	168
	Appendix A	171
	Appendix B	185
	Bibliography	191
	Samenvatting in het Nederlands	201
	Curriculum vitae	207

Acknowledgements

Doing a PhD isn't particularly easy and my mum's prosodic phrasing of *Waar begin je aan?* was spot on. But since I've been surrounded and supported, either knowingly or accidentally, by a bunch of nice people, I completed this dissertation in due time – give or take.

This work wouldn't be here without Lisa Cheng. She successfully chased me up in 2011 to write and submit a proposal to the Netherlands Organisation for Scientific Research (NWO). On the basis of an earlier draft by Crit Cremers and Niels Schiller, I gladly did so. I thank all three of you, being a well-balanced team of *promotores*, for your confidence in me and the great amount of freedom that you have given me.

Prior to submitting a proposal, I was introduced to the technique of ERPs by Leticia Pablos Robles during a joyful internship. *Domo arigato gozaimasu!* Following that, Jirina Vandebussche accompanied me in the course of writing, which was helpful to keep a steady tempo. *De Beebie!* Then, I approached my first ever job interview for which I was properly prepared after a serious mock interview with Maghiel van Crevel. *Dra!*

From practically day one, while picking up keys to the office, I became friends with Olga Kepinska and, soon after, her office mate Eleanor Dutton. The three of us would forge a mutual supervisorship helping each other to escape the valleys of (research) misery and to significantly improve our experiments and drafts. Olgi, you've been an outstanding travel companion to conferences and summer/winter schools. Elly, I value greatly the combination of lab managing, designing and lecturing a great methodological course, and musical intermezzos. Also, thanks for proofreading these 160 pages. Thank you witty and creative guys for making this PhD trip a blast.

Shortly after I started my project I learned that, especially when dealing with practicalities regarding labs and office, essential to a work space is support staff – the *WD-40* of an organisation. Thanks to regular advice, convos and banter from and with Jaap van Belen, Brahim Boulahri, Betty de Jonge, Adri van de Kerkhof, Alex van der Meer, Jos Pacilly, Mo 'Pakkie' Rbii and

Merel van Wijk, I found numerous shortcuts to overcome unforeseen hiccups, which helped me to stay sane in the workplace.

I carried out my first two ERP experiments in the basement of the Psychology Department. I am thankful to Guido Band, Maureen Meekel and Kerwin Olfers for their tips and tricks.

In the meantime at LUCL, I got to know many staff members, PhD candidates, post-docs, students and guests, who all contributed to a warm and stimulating work environment. Special memories are connected to my first office that was next to a natural common room. There, I shared many laughs and chats with Linda Badan, Jermy Balukh, Martine Bruil, Anne van der Kant, Carmen Ebner, Andreea Geambasu, Allison Kirk, Martin Kohlberger, Marie-Catherine 'MC-ke' Michaux, Borana Lushaj, Marieke Meelen, Laura Migliori, Jessie Nixon, Victoria Nyst, Gareth 'Gary' O'Neill, Dafina Ratiu, Benjamin 'Bennie' Suchard, Mulugeta Tsegaye, Marijn van 't Veer, Daan van de Velde and the incidental LUCL passerby.

In the second leg of my PhD, I carried out three ERP experiments and finalised my thesis during which I received considerable moral support from Kate Bellamy, Saskia 'Saksia' Lensink, Viktorija 'Happiness Agent' Kostadinova (*coolage!*), Morana Lukač, Min Liu, Nazar Nazarudin, Matthias Pache, Alex Reuneker, Gulnaz 'Guli' Sibgatullina, Yang Yang, Cesko 'Ceski' Voeten and Man 'Captain Slow' Wang. Furthermore, I attended the LSA in Chicago during which I broadened my views through Klinton Bicknell, Lyn Frazier, Philip Hofmeister, Ellen Lau, Roger Levy, Colin Phillips and Ming Xiang. Conversations during drinks, meals, walks and bicycle rides I had with Aaron Apple, Iria de Dios-Flores, Lara Ehrenhofer, Rabia Ergin, Ophelie Gandon, Maren Berg Grimstad, Heidi 'Birthday Buddy' Getz, Kelly Kasper-Cushman, Jo Mackby, Paula Márquez Caamaño, Zoey Liu, Joey Lovestrans, Darcy Rose and Jolien Scholten still resonate.

I welcomed a total of 186 participants during the past five years. Wouter Broos, Isabella Jordanoska, Judith Kelholt and Naomi Nota played a crucial role in reaching this amount.

Although the last five years I have neglected a large group of friends, a small group still kept an eye on me: Petra & Jeroen van Alphen, Dirk & Gebke van den Bosch, Vincent & Trudy van Diemen, Niels Joor, Hans Lardee, Nicoline & Igor Sekeris, Jacco Spaargaren, Gijs van Straalen and Koen de Vries. I promise there will be make-up time for everyone I missed.

I wouldn't be where I am now without the unconditional love, humour and nurture of my parents Han & Elly. During my PhD, the family expanded by 1/3 as I happily became uncle of two jubilant little fellows – thanks to Judith & Yorick.

Finally, but never least, I find myself *kei*-lucky waking up everyday next to my dotting 'best' half. Whether it's rebuilding an entire house, starting a business, completing a PhD, or changing the walk of life otherwise, Apie, your bright and high-spirited moves make anything go lightly. I'm looking forward to our next adventure.

Abbreviations

AFF	affirmative
A-P	articulatory-perceptual
CCG	Categorial Grammar
C-FOCUS	contrastive focus
C-I	conceptual-intentional
CS	conceptual structures
DET	determiner
F	feminine
HPSG	Head-driven Phrase Structure Grammar
INF	infinitive
IntP	intonational phrase
LF	logical form
M	masculine
NEG	negation
NP	noun phrase
ORPH	orphan
PF	phonological form
PP	prepositional phrase
PREP	preposition
PS	phonological structures
PST	past
QUD	question under discussion
REFL	reflexive pronoun
SG	singular
SS	syntactic structures
VP	verb phrase

