

## University of Groningen

### Concurrent multitasking

Nijboer, Menno

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2016

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Nijboer, M. (2016). Concurrent multitasking: From neural activity to human cognition [Groningen]: Rijksuniversiteit Groningen

**Copyright**

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

**Take-down policy**

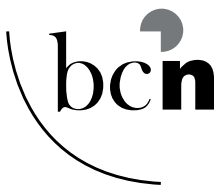
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

# CONCURRENT MULTITASKING

From neural activity to human cognition

Menno Nijboer



Printed by Ridderprint,  
Ridderkerk, the Netherlands

ISBN printed version: 978-90-367-8611-9  
ISBN digital version: 978-90-367-8612-6

This investigation was partially supported by a grant from the European Research Council (ERC) awarded to Niels Taatgen (grant no. 283597).

© Menno Nijboer, Groningen, The Netherlands, 2016



rijksuniversiteit  
 groningen

# Concurrent multitasking

From neural activity to human cognition

## Proefschrift

ter verkrijging van de graad van doctor aan de  
Rijksuniversiteit Groningen  
op gezag van de  
rector magnificus prof. dr. E. Sterken  
en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

vrijdag 4 maart 2016 om 16.15 uur

door

**Menno Nijboer**

geboren op 9 november 1984  
te Smalingerland

**Promotor**

Prof. dr. N.A. Taatgen

**Copromotores**

Dr. H. van Rijn

Dr. J. P. Borst

**Assessment committee**

Prof. dr. D. D. Salvucci

Prof. dr. K. Brookhuis

Prof. dr. ing. W. Verwey

# Contents

<b>1. Introduction</b>	<b>1</b>
Introduction	3
Cognitive modeling	7
Dissertation overview	8
<b>2. Single-task fMRI Overlap Predicts Concurrent Multitasking</b>	<b>9</b>
<b>Interference</b>	<b>9</b>
Introduction	11
Methods	15
Results	17
Discussion	32
Conclusion	37
<b>3. Contrasting Single and Multi-Component Working-Memory Systems in</b>	<b>39</b>
<b>Dual Tasking</b>	<b>39</b>
Introduction	41
Model 1	48
Experiment 1	52
Experiment 2	58
General Discussion	67
<b>4. Driving and Multitasking: The Good, the Bad, and the Dangerous</b>	<b>71</b>
Introduction	73
Method	76
Results	80
Discussion	90
Appendix: Integrated Driving Performance	92
<b>5. Decision Making in Concurrent Multitasking: Do People Adapt to</b>	<b>95</b>
<b>Task Interference?</b>	<b>95</b>
Introduction	97
Experiment 1	100
Experiment 2	106
Experiment 3	111
General Discussion	115
<b>6. Summary and Conclusions</b>	<b>117</b>
Summary and Conclusions	119
Concluding Remarks	124
<b>Nederlandse Samenvatting</b>	<b>126</b>
<b>Acknowledgements</b>	<b>132</b>
<b>References</b>	<b>133</b>
<b>Publications</b>	<b>146</b>

