Science is never done alone. The knowledge we have about our world is due to the accomplishments of scientists that built upon the accomplishments of others that came before them. Accordingly, although this thesis is an amalgamation of the work that I have produced over the past four years in Groningen, no idea was thought, or microliter was pipetted, no second of video observed, or single sperm ejection counted without the help of those here and afar. I would like to take the opportunity to thank everyone who has made this possible.

First and foremost I would like to express my deepest gratitude to Jean-Christophe Billeter, my supervisor. From the first day of my PhD to the very last second you have been able to keep me motivated, focused, and determined to become a better scientist. It has been a true honour to have worked so closely with you. You went far beyond the call of duty as a supervisor, a teacher, and a mentor. I will miss our discussions where we talked about data, designed new experiments, ate some Swiss chocolate, and of course exchanged a bit of gossip. Thank you for giving me the opportunity to live in Europe and explore this new field of research. Thank you for teaching me, dealing with my limitations (and my irrational fear of technology), and pushing me to develop both professionally and personally. I admire your constant enthusiasm to investigate and to learn. Thank you for trusting me in your lab, and with your expensive machines, but more importantly thank you for trusting my work and my opinion: it is the true signal to me that my time here has been a success. Although I will miss you very much, I leave with your “just do it, and then do it again” mentality branded onto my soul, and I will never forget your words of encouragement to “push the boundaries of knowledge”. I consider myself an extremely lucky person to have worked with you and tremendously privileged to have been your first PhD student. Merci beaucoup.

But of course, none of this would have been possible without my incredibly supportive and loving parents, Jim Laturney and Louise Laturney. Without you, your encouragement, your love, your time, and indeed a lot of your patience over the years, I wouldn’t be here. All of my accomplishments in life are a direct result of your unwavering belief that I can achieve anything. You always gave me the benefit of the doubt. Having someone in your corner is the greatest gift parents can give to their children- and you give this to me everyday. Dad, you have lead by example how to be a hard worker, how to make sacrifices for the important things in life. Mom, you will forever be the definition of a strong loving woman, especially
Acknowledgements

in trying times. Finally, thank you both for allowing me to explore the world and always have a home to come back to.

To my wonderful paronymphs Theresa Flößner and Giulia Zerbini, my fellow buitenlanders. You two are my head and my heart. Theresa, thank you for always giving it to me straight. It takes a true friend to tell you what you don’t want to hear. My motto “what would Theresa do” has guided for the past few years and will continue for years to come- even if I don’t always listen to it. Giulia, you have taught me to experience the world through a new set of eyes. You find the love and beauty where most see just the dark. I have learned first hand the organizational capabilities of the German and the passion and love of the Italian. Together, the three of us have travelled across Europe, survived a Pink Pop weekend, saw a Chinese Tower in an English Garden in the middle of Munich, celebrated achievements, consumed a frightening amount of alcohol (my favourite was the thunder wine), ate, danced, sang, shopped, and laughed. You have made these years so incredibly unforgettable (except for the nights that we can’t remember).

To my dear friend Nele Zickert. Your creativity continues to amaze me. Thank you so much for the incredible cover that you created for this thesis. You have been there for me since day 1 and have been a friend that I could count on through it all. Thank you for your constant support. I will miss our old Saturday afternoon routine: hunting for the deals at the market, and then figuring out how to get it all home on our bikes. You are my problem solver and someone who I can lean on when it gets tough. I look forward to the adventure that awaits you.

To my fellow North Americans, Shane and Whitney Wright. Initially we bonded over being in a similar situation, findings the same Dutch stuff weird and missing the North American ways (guns, maples syrup, canned pumpkin... the usual). But over time you two have provided me much more than a little taste of home. Besides the great stories at lunch or being a very dependable running partner through the cold, wet, and windy days, you two have demonstrated an amazing example of love. Thank you for being apart of my life.

To Jenke Gorter and Andrea Soto: it was a blast sharing the lab with you. Although we have our differences, we were all eventually united by our strong dislike for the same entity: the genes and behaviour course. Jenke, I have watched you transition into and out of many roles during the last 4 years: Master student, practical lab coordinator, jewelry designers, and of course a fellow PhD candidate. But your most fantastic role is your new one as a mother. I am amazed every day at your selflessness and I admire your strength. Andrea, I will miss our conversations
about life, cultural expectations, and our shared addiction to great coffee. I have very much enjoyed hearing your perspective on the world and I admire your tireless energy. And of course, thanks for all the free medical advice.

And to the other lab members that came and went, you made the lab a great place to work. Special thank you to Wouter van der Bijl who not only sacrificed at least two weeks of his life teaching me the ways of the insufferable gas chromatographer software, but also helped me tremendously during the creation of this thesis. Thank you for showing me all the important things in life including (but not limited to) secret bike paths in Groningen and the best bars in Stockholm. To Jeroen Alkema, you were a friend from the moment we met. Thank you for always being there for me to look after Garth. Since you survived one of the coldest winters in Canada on record, I must say I have respected you a little more. I am so excited to see what life will bring you. And to the girl who pretty much started it all: Sanne Roessingh! Your ideas and our very early discussions sparked questions that later fueled some of the hypothesis in this thesis. Very much appreciated.

Roel van Eijk: you saved the day (or at the very least, the paper). Thank you very much for all your help during experiments. It was long, and sometimes painful work in dark windowless rooms but we did it! And I truley could not have accomplished it without you.

Gegard Overkamp and Martijn Salomons. Thank you for helping our lab. You put up with our outrageously big and inaccurate food orders, our million and half fly stocks, and our endless bags of waste to be autoclaved. Gegard, you are the one we count on to locate the hard-to-find materials! And it cannot go unmentioned that you accepted our requests to change the CO₂ tanks on weekends and holidays. The entire lab would not function without you. Thank you for doing it all, everyday, and with a smile.

And of course, a massive thank-you to my darling students. There have been many of you over the years: Marnix Bosma, Jochem Kalthof, Lara van Renssen, Nikki Spaan, Nynke Kooistra, Tessel Lagerwerf, Tessa Heestermans, Angela Rosink, and Sudi Chaun. A shout out to my honorary students Suus Bezema, Hennie Godthelp, and Tom Alisch. Technically I wasn’t your supervisor but you made the lab a great place to be. A huge thank you to Eva de Goeij and Ilse Jansen who’s work allowed me to finished up some of these chapters. But more importantly, thank you for teaching me to live in the moment, to take the trip, and reminding me that “I am an oak”. For such young women you can be so wise. You both have made a significant impact on my life. To all of you,
each and everyone of you surprised me: sometimes in good ways and sometimes not so much. But you always taught me something. I had to learn how to teach, how to be a supervisor, and most importantly when to let you fail and when to step in and take control. I made plenty of mistakes, but I hope I was able to teach you something in the end. You all did lots of work. You came in on weekends, showed up for early morning experiments, and stayed late into the night just so we could answer a few questions about flies. I have enjoyed watching you learn and master tasks that you thought would be impossible. Your outlook on research was always refreshing. In the end, you all made me proud, and I enjoyed being part of your learning experience. Your faith in me as a leader gave me the motivation to become one. I hope you all now think flies are pretty neat, and science is way cool.

To dr. Martine Maan, thank you for being apart of my time here. During the initial interview for the position you asked me some tough questions, and you continued to be a terrifying scientist throughout my time here. I have enjoyed listening to your logic and reasoning in the various group discussions and presentations. I strive to have your clarity of thought. It is my interactions with you that remind me how much I love evolutionary biology. You have helped me grow as a scientist by being a great one yourself.

To my advisor Prof. dr. Ton Groothuis. You faithfully attended my yearly meetings and always seemed to enjoy learning about the possibilities that exist when you use a simple fly in research. You were supportive yet critical and the balance of the two is what makes you the legendary supervisor that you are. But above that, your highly inquisitive mind and desire for elegance in experiments sets you apart as a scientist. It has been an honour to have discussed my data with you and I am forever grateful for your input on the experiments contained within this thesis.

I would like to thank Prof. dr. Bregje Wertheim for sharing your expert opinion of chemical communication in insects and giving me the opportunity to talk at the Entemology day. It was my favourite conference of my PhD. Throughout my training you showed constant support, treated me as an equal, and always considered my ideas and opinions.

Thank you to the reading committee, Prof. dr. Ody Sibon, Prof. dr. Leo Beukeboom, and Prof. dr. Mariana Wolfner who took the time out to evaluate my work. I hope you enjoyed reading it.
Thank you to the entire EGDB and the old Behavioural Biology group who had to suffer through so many talks about fly sperm and decapitated females. Your critical minds have made me a better scientist. I would also like to thank Klaas Sjollema at UMIC for teaching me the ropes on the confocal microscope.

Finally I would like to send a massive thank you to my family and friends in Canada. Your birthday cards, Christmas greetings, emails, BBMs, and skype conversations are what got me through many rough patches here. To my brother Chris Laturney, my sister Katy Lopez and her husband Ivan Lopez, and my Ladies of the Pain: Liz Fitzgibbons, Paula Cado and Breanna Crossman. Being away from home is not always easy, but having a strong support system back home makes it possible. Thank you for always encouraging me to go after my dreams and believing that I could achieve them. I couldn’t have done it without you.