

Brandon Forys

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Education and training

University of British Columbia, Vancouver, BC, Canada, PhD in Psychology 2022-
Supervisors: Dr. Rebecca Todd & Dr. Alan Kingstone

University of British Columbia, Vancouver, BC, Canada, M.A. in Psychology 2020-2022
Supervisors: Dr. Rebecca Todd & Dr. Alan Kingstone
Masters' thesis: *Gender moderates the relationship between mood disorder symptoms and effortful avoidance performance.*

University of British Columbia, Vancouver, BC, Canada, B.A. Honours in Psychology 2016-2020
Supervisors: Dr. Rebecca Todd (Honours), Dr. Kiran Soma (Honours), & Dr. Timothy Murphy
Honours theses: *Modulating effort cost in human avoidance behaviours.; A novel steroidogenic model for reward-seeking behaviour.*

Honours and Awards

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| Faculty of Arts Graduate Award, UBC | 2023 |
| Stanley Coren Prize in Psychology, UBC | 2023 |
| Four Year Fellowships (4YF) For PhD Students, UBC | 2022-2026 |
| President's Academic Excellence Initiative PhD Award, UBC | 2022-2026 |
| Canada Graduate Scholarship – Doctoral, NSERC | 2022-2025 |
| Faculty of Arts Graduate Award, UBC | 2021 (deferred from 2020) |
| Canada Graduate Scholarship – Master's, NSERC | 2020 |
| NSERC Undergraduate Student Research Award, NSERC/UBC | 2020 |
| Faculty of Arts Graduate Award, UBC | 2020 |
| Trek Excellence Scholarship for Continuing Students, UBC | 2019 |
| ARTA Scholarship, Alberta Retired Teachers' Association | 2019 |
| Wesbrook Scholar, UBC | 2019 |
| HSBC Emerging Leader Scholarship, UBC | 2019 |
| Suedfeld Scholar Award, UBC Psi Chi | 2019 |
| PSYC 217 Poster Award, 1st Place, UBC Psychology | 2018 |
| Student Scholarship in Arts, UBC Faculty of Arts | 2018 |
| Trek Excellence Scholarship for Continuing Students, UBC | 2017 |
| Stephen Straker Arts One Prize, UBC Arts One Program | 2017 |
| University of BC Sopron Memorial Scholarship, UBC | 2016 |
| Dean's List, UBC Faculty of Arts | 2016-17, 2017-18, 2018-19, 2019-20 |

Publications and presentations

JOURNAL ARTICLES

1. **Forys, B. J.**, Winstanley, C. A., Kingstone, A., & Todd, R. M. (2024). Short-term memory capacity predicts willingness to expend cognitive effort for reward. *bioRxiv*. <https://doi.org/10.1101/2024.02.12.579951>
2. Kryklywy, J. H., **Forys, B. J.**, Vieira, J. B., Quinlan, D. J., Culham, J. C., & Mitchell, D. G. V. (2023). Dissociating representation of affect and motion in visual cortices. *Cognitive, Affective, & Behavioural Neuroscience*, 1-24. <https://doi.org/10.3758/s13415-023-01115-2>
3. **Forys, B. J.**, Tomm, R. J., Stamboliyska, D.***, Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd, R. M. (2023). Gender impacts the relationship between mood disorder symptoms and effortful avoidance performance. *eNeuro*, 10(2). <https://doi.org/10.1523/ENEURO.0239-22.2023>
4. Ehlers, M. R., Kryklywy, J. H., Beukers, A. O., Moore, S. R., Forys, B. J., Anderson, A. K., & Todd, R. M. (2021). Reactivation of hedonic but not sensory representations in human emotional learning. *bioRxiv*. <https://doi.org/10.1101/2021.11.25.469891>
5. Xiao, D., **Forys, B. J.**, Vanni, M. P., & Murphy, T. H. (2021). MesoNet: automated scaling and segmentation of mouse mesoscale cortical maps using machine learning. *Nature Communications*, 12(1), 5992. <https://doi.org/10.1038/s41467-021-26255-2>
6. Hamden, J.E., Salehzadeh, M., Gray, K. M., **Forys, B. J.**, & Soma, K. K. (2021). Isoflurane stress induces glucocorticoid production in mouse lymphoid organs. *Journal of Endocrinology*, 251(2), 1-13. <https://doi.org/10.1530/JOE-21-0154>
7. Hamden, J. E.*, Gray, K. M.*, Salehzadeh, M., Kachkovski, G. V., **Forys, B. J.**, Ma, C., ... Soma, K. K. (2021). Steroid profiling of glucocorticoids in microdissected mouse brain across development. *Developmental Neurobiology*, 81(2), 189-206. <https://doi.org/10.1002/dneu.22808>
8. **Forys, B. J.***, Xiao, D.*, Gupta, P., & Murphy, T. H. (2020). Real-time selective markerless tracking of forepaws of head-fixed mice using deep neural networks. *eNeuro*, 7(3). <https://doi.org/10.1523/ENEURO.0096-20.2020>

*Co-first authors

PAPERS IN PREPARATION

1. Ehlers, M. R., Kryklywy, J. H., Beukers, A. O., Moore, S. R., **Forys, B. J.**, Anderson, A. K., & Todd, R. M. (in preparation). Reactivation of hedonic but not sensory representations in human emotional learning.
2. **Forys, B. J.**, Winstanley, C. A., Kingstone, A., & Todd, R.M. (in preparation). Short-term memory capacity predicts willingness to expend cognitive effort for reward.

POSTER PRESENTATIONS

1. **Forys, B. J.**, Tomm, R. J., Kryklywy, J. H., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd, R. M. (2023). Using a novel form of pattern component modeling with representational

similarity analysis to model information learned in active and inhibitory avoidance and reward-seeking. Presented at International Conference on Learning and Memory, 2023, Huntington Beach, CA.

2. **Forys, B. J.**, Kryklywy, J. H., Ehlers, M. R., Moore, S. R., Beukers, A. O., Anderson, A. K., & Todd, R. M. (2022). Modelling representations of continuously shifting stimuli: a novel sliding window approach. Presented at Cognitive Neuroscience Society Annual Meeting, 2022, San Francisco, CA.
3. Zheng, J.**, **Forys, B. J.**, & Todd, R. M. (2022). Maladaptive Transfer of Cognitive Effort in Emotional Situations. Presented at UBC Psychology Undergraduate Research Conference, 2022.
4. **Forys, B. J.**, Tomm, R. J., Stamboliyska, D.**, Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd, R. M. (2021). Gender selectively moderates relationships between mood disorder symptoms and performance of effort related avoidance and reward-seeking tasks. Presented at Neuroscience 2021.
5. Tomm, R. J., **Forys, B. J.**, Daly, I. D., Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd, R. M. (2021). Depressive and anxiety symptom clusters in humans are related to distinct avoidance profiles in a cross-species translation of a go/no-go avoidance task. Presented at Neuroscience 2021.
6. Daly, I. D., Tomm, R. J., **Forys, B. J.**, Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd, R. M. (2021). Levels of depressive and anxiety symptoms in humans predict distinct patterns of reward-seeking: A cross-species translation of an appetitive go/no-go task. Presented at Neuroscience 2021.
7. Tomm, R. J., Daly, I. D., **Forys, B. J.**, Floresco, S. B., & Todd, R. M. (2021). Anxiety and depressive symptoms in humans are related to distinct avoidance profiles in a cross-species translation of a go/no-go avoidance task. Presented at the International Behavioural Neuroscience Society Meeting, 2021.
8. Sidarth, A.**, **Forys, B. J.**, & Todd, R. M. (2021). Cognitive control on reward-seeking behavior. Presented at UBC Multidisciplinary Undergraduate Research Conference, 2021, and UBC Parkinson's and Alzheimer's Targeted Hope and Support Conference, 2021.
9. Xiao, D., Gupta, P., **Forys, B.**, & Murphy, T. H. (2020). Real-time forepaw movement coded auditory feedback promotes motor skill learning in mice. Presented at UBC Psychiatry Virtual Research Day, 2020.
10. **Forys, B. J.**, Xiao, D., Gupta, P., Boyd, J. D., & Murphy, T. H. (2019). Short latency (~100 ms) markerless video tracking of body parts in mice using deep neural networks. Presented at Neuroscience 2019, Chicago, IL., and UBC Neuroscience Undergraduate Research Conference, 2020.
11. Xiao, D., **Forys, B. J.**, Tandun, R., & Murphy, T. H. (2019). Automated alignment and segmentation of mouse mesoscale brain images using machine learning. Presented at Neuroscience 2019, Chicago, IL.; UBC Future of Health Research Day; UBC School of Biomedical Engineering Symposium, 2019.
12. **Forys, B.**, Tobiansky, D. J., & Soma, K. K. (2019). A novel steroidogenic model for reward-seeking behaviour. Presented at UBC Psychology Undergraduate Research Conference,

2019.

13. **Forys, B.**, Xiao, D., Gupta, P., Boyd, J. D., & Murphy, T. H. (2018). Real-time markerless video tracking of bodyparts in mice using deep neural networks. Presented at UBC Brain Circuits Cluster 2018; Neuroextravaganza 2018; UBC Undergraduate Neuroscience Conference 2019; UBC School of Biomedical Engineering Symposium 2019.
14. Tobiansky, D. J., Kachkovski, G., Enos, R. T., Schmidt, K. L., Ma. C., **Forys, B.**, Hamden, J. E., Jalabert, C., Floresco, S. B., Murphy, E. A., Soma, K. K. (2018). Perinatal sucrose exposure in rats disrupts hormones, brain, and behavior in adulthood. Presented at Neuroscience 2018, San Diego, CA. (Credited on poster, not on abstract)
15. **Forys, B.**, Phi, J., Shi, L., Yu, V. ZH. (2018). Emojinal perception: Emoji presence and perceived emotional valence. Presented at UBC Psychology Undergraduate Research Conference, 2018 (PSYC 217 Poster Award, 1st place winner).
16. **Forys, B.**, Tandun, R., Cookson, J., & Xiao, D. (2018). Predicting facial and paw movement from cortical mesoscopic calcium activity in mice: A machine learning perspective. Presented at UBC Multidisciplinary Undergraduate Research Conference, 2018.

**Trainee

INVITED TALKS

1. **Forys, B. J.** (2023). Exploring the structure of brain activity (and why it matters for neurophenomenology). Delivered at UBC Neurophenomenology Meeting, 2023, Vancouver, BC.
2. **Forys, B. J.** & Todd, R. M. (2023). Using fMRI to model representational content in a translational context. Delivered at UBC MRI Research Centre Annual Retreat, 2023, Vancouver, BC.

CONFERENCE TALKS

1. **Forys, B. J.**, Kryklywy, J. H., Ehlers, M. R., Moore, S. R., Beukers, A. O., Anderson, A. K., & Todd, R. M. (2022). Modelling representations of continuously shifting stimuli: a novel sliding window approach. Delivered at Cognitive Neuroscience Society Annual Meeting, 2022, San Francisco, CA.

SOFTWARE

1. Xiao, D., **Forys, B. J.**, Vanni, M. P. & Murphy, T. H. (2021). MesoNet: automated scaling and segmentation of mouse mesoscale cortical maps using machine learning. Code Ocean. <https://doi.org/10.24433/CO.1919930.V1>
2. Kryklywy, J.H., **Forys, B. J.**, & Todd, R.M. (2021). Pattern Component Modelling for R (PCM-R), R package, pre-release. <https://github.com/bf777/PCMforR>

Teaching and mentoring

TEACHING

Teaching Assistant and Guest Lecturer, UBC fMRI Brain Camp, 2023.

Helped design and conceptualize the course structure. Taught five sessions on fMRI preprocessing and open data practices, including how to use the BIDS format, conduct quality control, run representational similarity analysis, use fMRIPrep, and run analyses on high-performance computing platforms. Provided technical support to students at all stages of preprocessing.

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| Teaching Assistant with Dr. Rebecca Todd, PSYC 365, Cognitive Neuroscience, UBC | 2024 |
| Teaching Fellow with Dr. Catherine Rawn, PSYC 217, Research Methods in Psychology, UBC | 2023 |
| Teaching Assistant with Dr. Rebecca Todd, PSYC 365, Cognitive Neuroscience, UBC | 2023 |
| Teaching Fellow with Dr. Andrew Rivers, PSYC 217, Research Methods in Psychology, UBC | 2022 |
| Teaching Assistant with Dr. Rebecca Todd, PSYC 365, Cognitive Neuroscience, UBC | 2022 |
| Teaching Fellow with Dr. Catherine Rawn, PSYC 217, Research Methods in Psychology, UBC | 2021 |
| Teaching Assistant with Dr. Rebecca Todd, PSYC 365, Cognitive Neuroscience, UBC | 2021 |
| Teaching Fellow with Dr. Catherine Rawn, PSYC 217, Research Methods in Psychology, UBC | 2020 |
| Teaching Fellow with Dr. Catherine Rawn, PSYC 218, Analysis of Behavioural Data, UBC | 2020 |
| Teaching Assistant with Dr. David King, PSYC 305A, Personality Psychology, UBC | 2019 |

MENTORING

Undergraduate honours students

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| Michelle Gitaari, University of British Columbia | 2023- Honours thesis: <i>High vs. low effort: How perception of cognitive effort ability impacts effort deployment choices.</i> |
| Skye Zheng, University of British Columbia | 2022-2023 |
| Honours thesis: <i>Maladaptive transfer of cognitive effort in emotional situations.</i> | |

Undergraduate directed studies students

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| Dayana Stamboliyska, University of British Columbia | 2021-2022 |
| Paper: <i>Self-Efficacy in modern computational theories of motivated action.</i> | |

Undergraduate research assistants

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| Rita Jin, University of British Columbia | 2023- |
| Emily Qi, University of British Columbia | 2023- |
| Niharika Dwivedi, University of British Columbia | 2023 |
| Paul Kee, University of British Columbia | 2022 |
| Aanandi Sidarth, University of British Columbia | 2021-2022 |

Mentorship positions

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| Diversity Mentor, UBC Psychology Diversity Mentorship Program | 2021- |
| Mentors students interested in applying to graduate school in Psychology, guiding them through the mentor selection and school application process and meeting with them on a regular basis. | |

Skills

Programming Languages: Python, bash, R, JavaScript, MATLAB, C#, HTML/CSS, Swift, Java

Machine Learning and Computer Vision: TensorFlow, Keras, OpenCV

Experimentation Technology: PsychoPy, PsychToolbox, fMRIPrep, AFNI, FSL, CONN, fMRI-CPCA, BioSemi EEG, EEGLAB, LabChart/PowerLab

Web Frameworks: Django, Flask, npm, Bootstrap, Wordpress, Squarespace

Infrastructure: Docker, VirtualBox, QEMU, Azure, High performance computing (SLURM, PBS)

Visualization: Photoshop, Illustrator, Inkscape, Unity, Blender, AutoCAD, 3DSMax, Revit, Inventor

Professional affiliations

Member, Society for Neuroscience 2019-

Member, Psi Chi International Honor Society in Psychology 2019-

Languages

English – native; French – fluent