UNIVERSITY OF CAPE TOWN
SCIENCE FACULTY RESEARCH ETHICS STATEMENT
Application to the Science Faculty Research Ethics Committee for research involving human subjects

A key function of the Science Faculty Research Ethics Committee is to screen and approve, or otherwise refuse, all research proposals in the Faculty that relate to human subjects (see definition in section 2 overleaf), including questionnaires involving human participants; this includes proposed research involving students or staff, by UCT researchers. Outside visiting researchers seeking to work with UCT staff or students must do so in collaboration with a member of UCT staff. Research that does not involve human subjects or third party data collected from human participants does not need to be submitted to this committee for approval. Research on animals needs to be approved by the Faculty's Animal Ethics Committee; and research that uses biological materials from humans (e.g. fresh tissues, blood or body fluids) needs also to be approved by the Faculty's Biological Safety Committee.

Presently, in-person human subjects research is restricted. If you need to apply for permission to recommence previously approved research, please amend your FSREC Ethics statement indicating your plans for risk management, write a letter of motivation, and complete the checklist (downloadable here). Those applying for new clearance for fieldwork involving human subjects should indicate this with their plans for risk management in their application and also complete the checklist. The checklist should be submitted with the ethics statement form as supplementary documentation.

This **research ethics statement form** and the appended **informed consent form** should be completed and submitted by the actual person undertaking the research ('the applicant'). All details must be **typed**. Please read the **UCT Code for Research involving Human Subjects** before completing the form: http://www.uct.ac.za/downloads/uct.ac.za/about/policies/ethicscode.pdf

In the case of research that involves a number of researchers, this form should be endorsed and signed by the Principal Investigator (PI). If the applicant is a student, the supervisor must endorse and sign the form and ensure that the student is fully informed of his/her ethical responsibilities. Where the research is part of a project that is being co-ordinated from outside the Science Faculty, the researcher should fill in the form in relation to her or his part of the larger research project. The turnaround time for a reply is approximately 10 working days.

All applicants
Please submit the form (in the original MS Word format) to http://bit.ly/uct-fsrec-2021

This form must be completed electronically (i.e. typed) by students and supervisors, and submitted as a Word document as indicated above. The fields are expandable (horizontally and vertically). Use Enter when you get to the end of the page, to prevent the fields from spilling too far on the horizontal axis. Attachments will not be considered except as specified in the form.

Expedited Review
Researchers from the Departments of Computer Science or Environmental and Geographical Science conducting studies which entail only minimal risk, that do not involve the collection of any privately identifiable or sensitive personal data, are not contentious or are not working with any vulnerable populations (e.g. pregnant women, minors, prisoners, low-income communities) may apply for **expedited review** by ticking 'Yes' in section **B2**. Applications for expedited review are not necessarily faster, but only require the approval of one member of the Science Faculty Research Ethics Committee in addition to the Chair. For CS applications this typically (but not necessarily) entails testing the **usability** of programmes and applications. '**Usability**' in this context is defined to include learnability, efficiency, memorability, accuracy, ease of use and user experience, typically with an artefact or prototype. However, if the research also involves the collection of any privately identifiable or sensitive personal data about participants (e.g. information on disabilities, vulnerabilities, health/medical conditions and/or treatments) then the proposal is **NOT** eligible for expedited review. Projects using human subjects and not judged to be of minimal risk will be submitted for review by the full committee.

Questions?
Please send queries to your departmental contact or directly to the Servicing Officer of the FSREC.
Chair: Dr Shari Daya, shari.daya@uct.ac.za
Servicing Officer: Ms Shanaaz Smith, shanaaz.smith@uct.ac.za
Computer Science Subcommittee: csethics@cs.uct.ac.za
Environmental and Geographical Science Subcommittee: egsethics@uct.ac.za

A. STUDENT AND SUPERVISOR DETAILS

A.1	**Applicant personal particulars** (required): *You may enter more than one name here, if this is a group project.*			
	Title and name(s):	Zach Colin Wolpe		
	Email(s):	zachcolinwolpe@gmail.com		
	Telephone:		Mobile number:	
	Department(s):	Statistics		
A.2	**Supervisor particulars** (required):			
	Staff no:	1440817		
	Title and name(s):	Dr Jonathan Shock		
	Telephone:		Mobile number:	
	Email:	jonathan.shock@uct.ac.za		
	Department:	MAM		

A.3	**Collaborators** (optional): This will include any external collaborators or research assistants that are involved in this project.		
	Title and name	Institution	Role
	Assoc Prof Benjamin Ultan Cowley Tuisku Tammi, MA	University of Helsinki	Project lead, research advisor

A.4	**Project** (required): *The title of the project should be suitably descriptive of the work entailed.*	
	Title	**DynOCog: computational modelling of Optimal human learning in Dynamic Cognitive tasks**
	Project duration (month/year - month/ year)	**01/2021 - 06/2021**
	Purpose (tick)	
	Honours Project	
	Masters by coursework and dissertation	**X**
	Masters by dissertation only	
	PhD thesis	
	Academic research	
	Contract-funded research	
	Other research (please specify)	

B. PRE-REQUISITES (all answers required)

B.1	**Have you read the UCT Research Ethics Code for Research Involving Human Participants?** This code is available for download from the UCT web-site's listing of policies – scroll down the alphabetical listing to 'Research', where you will find this specific code: http://www.uct.ac.za/about/policies/ Yes [x] No [ ]
B.2	**Are you applying for expedited review?** Computer Science and Environmental and Geographical Science: You are only eligible for expedited review if your project meets the criteria detailed on p.1 of this form Yes [x] No [ ]
B.3	**Is your research making use of human participants or subjects as sources of data?** Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains (1) data through intervention or interaction with the individual, or (2) identifiable private information, which includes a subject's opinion on a given topic. Yes [x] No [ ]
B.4	**Is your research making use of third party data?** If yes, please (i) give details in section C1 about the nature of the data, how it was acquired, and any restrictions on its use, (ii) answer section B5 below with respect to the custodian/ source of the data, (iii) ensure you address in sections C and D the ethical issues related to your use of the data, including the process by which permission was sought from participants for the anonymised use of their data. If free and prior informed consent was NOT sought by the custodian of the data, please provide an explanation and briefly reflect on the ethical implications of this for your own research. Please note that a clearance certificate is not required by the FSREC for use of anonymised third party data, although you should still consider ethical implications of your work and seek proper permissions from the custodian of the data for its use. However, if the data custodian or another entity requires ethics clearance, please clearly state the reasons for the requirement in B5. If you are using non-anonymised data, please detail your data storage and protection procedures in C1. Yes [ ] No [x]
B.5	**Does your research require express permission from a third party, such as governments, property owner(s), occupier(s) or manager(s), or other institutions?** Yes [ ] No [x] **Please state from whom permission is required:**
	Have you received permission to proceed? If yes, please attach or append a copy of the permission, or explain the nature of the permission received. If no, please provide an explanation. Yes [ ] No [ ]

B.6	**Is your research being conducted within a National Park or Nature Reserve (or similar) or any other area for which a permit is required?** Yes [ ] No [x] **Please state from whom permission is required:** **Have you obtained the required permit?** If yes, please attach or append a copy of the permit. If no, please provide an explanation. Yes [ ] No [ ]
B.7	**Does your research intend to make use of UCT students or staff as participants?** For research involving UCT students you must send a DSA100 form with your clearance certificate to the Executive Director of the Department of Student Affairs (DSA) for approval to conduct this research. For research involving UCT staff, you must submit the HR194 form with your certificate to the Executive Director of the Human Resources Department for approval to conduct the research. You will need to first receive ethical clearance from the Science Faculty Research Ethics Committee (FSREC). After you receive ethical clearance from the FSREC please write to Shanaaz Smith (shanaaz.smith@uct.ac.za) for the appropriate forms. Yes [ ] No [x]

C. RESEARCH FOCUS (required, maximum 500 words, may not exceed this page)

C.1	In the space below state your research aim and objectives (or questions); briefly outline your plans for data collection, and indicate the nature/type of information you will be seeking from the participants in your research. Please also indicate the number of participants you envisage and how you will recruit them for your research. Do NOT submit additional documents. Your proposal will be evaluated on information in this form alone. Please note that ethics applications are reviewed by a multi-disciplinary committee and should be written in a manner that does not assume specialist knowledge. For this reason, acronyms/ abbreviations should be written out in full the first time they are used, followed by the shortened version in brackets.
	AIM This study aims to understand how cognitive capacity, primarily working memory, affects performance during instrumental learning, i.e. learning from feedback under uncertainty. OBJECTIVES The project will build a probabilistic model of individual learning in a card sorting task, which is a widely studied domain providing a simple test of executive functions. The project will use parameters of the learning model to analyse relationships between learning performance and working memory capacity, measured from other tests. DATA COLLECTION The project will use the PsyToolkit platform to create a task battery, including the following tasks: - Card Sorting Task (Wisconsin variant), a test of executive functions - N-back task (2 back variant), a test of working memory - Corsi Forward-span Block Task, a test of working memory - Navon task, a test of global-local attention preference (used for control purposes) - Fitt's task, a test of motor control (used for control purposes) The resulting task battery will be made available on the international platform mTurk, based on the existing integration functionality provided by PsyToolkit. From mTurk, the project will gather responses to these tasks providing behavioural data for model fitting, and psychometric scores for analysis and control. Additional background information will be gathered on subject age, gender, and handedness. No identifying information will be gathered, nor any information of a sensitive nature. SAMPLE SIZE AND RECRUITMENT Based on prior literature (van Slooten Jahfari, & Theeuwes, 2019, *Scientific Reports 9:17436*), we expect our model to fit the data with about 40 subjects; to then observe effects with respect to psychometric variables, we will increase the sample size by an order of magnitude. *Thus, sample target size is N = 100* This will be facilitated by the cloud-based data gathering platform, where we will recruit subjects using the established procedures of offering remuneration to the existing native English-speaking worker pool, which is very large.

D. PARTICIPANT PROCEDURES (all answers required)

D.1	**Information**
	Will research participants have reasonable and sufficient knowledge about you, your background and location, and your research intentions? By ticking the 'Yes' box, you declare that you have completed and will use the **informed consent form** appended to this statement, and that whether you are seeking written or verbal consent, you will explain the content of the consent form verbally to each participant. Any other information you want to provide to strengthen your application w.r.t. the provision of information may be included in the box below. If your answer is 'No', please provide justification. Yes [ ] No [x] Research participants WILL be given reasonable and sufficient knowledge about the project leader (Cowley), his background, location, research intentions. However, using cloud-based data gathering platforms, verbal explanations of such will not be possible(this is only reason to tick 'No'). Detailed information on the study, informed consent via tick box, and option to opt out, are all available to subjects in the proposed study.
D.2	**Consent**
	Will you secure the free and prior informed consent of all participants in the research? Please ensure that you complete the **informed consent form** at the end of this document with the particulars of your project, or include the form or script you will use. By ticking the 'Yes - Written' or 'Yes - Oral' box, you declare that you: • commit to ensuring that each participant understands the informed consent statement, agrees to participate, before any research begins • retain a record of informed consent, either by keeping a copy of the signed form, or in the case of oral consent, recording time and place of consent in writing with the signature of a witness, or on an audio device • will give the participant a copy of the signed form and keep a second copy for yourself (in the case of written consent) Yes - Written [x] Yes - Oral [ ] No [ ]
	Please provide your procedure for securing informed consent of all participants. If you ticked 'No', explain why waiver of prior informed consent is required. Any other information you want to provide with regard to consent may also be included in the box below, including any plans required to translate the form or oral informed consent script into the language of research participants, and a brief motivation for oral consent if applicable

As noted above, detailed information on the study, informed consent via tick box, and option to opt out, are all available to subjects in the proposed study.

Only native English speakers will be recruited and thus materials will not be translated.

The informed consent text we use is as follows:

This 'Human Intelligence Task' (HIT) is part of a joint scientific research project conducted by University of Helsinki, Finland, and the University of Cape Town, South Africa. Your decision to complete this HIT is voluntary. There is no way for us to identify you. The only information we will have, in addition to your responses, is the time at which you completed the survey.

The HIT involves 5 tasks, plus a few short background questions. The tasks are designed to test executive functions. Instructions are given to fully explain each task. The whole HIT takes an average of 18 minutes to complete, and you will be paid [.50] for your participation.

The results of the research may be presented at scientific meetings or published in scientific journals. The research will not benefit you personally and no aggregate feedback from your tasks will be given. We know of no risks resulting from participating in the study.

Clicking on the 'SUBMIT' button on the bottom of this page indicates that you are at least 18 years of age and agree to complete this HIT voluntarily.

You may withdraw at any time, and you may choose not to answer any question, but you must proceed to the final screen of the study in order to receive your completion code which you must submit in order to be paid.

In accordance with Mechanical Turk policies, we may reject your work if the HIT was not completed correctly or the instructions were not followed.

If you have any questions about the research please contact me at wlpzac001@uct.co.za, or my advisors at Jonathan.shock @uct.ac.za at ben.cowley@helsinki.fi

D.3	**Recording**
	Will you take photographs, audio recordings or videos of your participants? Photographs, audio, and video recordings contain personally identifiable information, even if the face is not visible, and may also be prohibited by certain individuals and cultures or violate people's rights to privacy. By ticking the 'Yes' box, you declare that you: • will commit to asking permission prior to initiating any photograph or recording • will not photograph or record participants who have declined • will seek the free and informed consent of participants prior to using any recordings or photographs in publications, project websites, presentations, social media or other means of dissemination. If yes, please provide (i) a rationale for using such material in your research, (ii) the procedure for securing consent for recordings (this may entail modifications to the consent form), and (iii) an explanation of how you intend to use the material. *Please ensure that the content of this section aligns with the informed consent statement at the end of this form.* Yes [ ] No [x]
D.4	**Confidentiality**
	Are you able to offer privacy and confidentiality to participants, if they wish to remain anonymous? The default requirements of the Science Faculty Research Ethics Committee are to assure that either: (a) study data are de-identified (identifiers are stripped or separated), or (b) data are collected without identifiers (anonymous). If you wish to use the names and organisational affiliations of participants in your research: (i) tick 'No'; (ii) provide a reasoned motivation in the box below why you are adopting this approach, indicating why this does not have ethical implications for the participants, and (iii) modify the appended prior informed consent form appropriately so that it reflects a participant's agreement that you may use his or her name and/or affiliation together with the information they provided. If there are any aspects of your research where there might be difficulties or problems with regard to protecting the confidentiality and rights of participants, and honouring their trust, explain this in detail below. Yes [x] No [ ]

D.5	**Potential harm for participants**
	Outline any foreseeable risks of legal, physical, psychological or social harm or suffering to participants and/or the environment, which might result from, or occur in the course of, this research. Please include what these risks might be and what preventative steps you plan to take to avoid or minimise such harm from being suffered, and include a summary of these risks in the appended prior informed consent form. Residual risks are to be balanced by your response to question D.8 below (on the benefits of the research). If there are no foreseeable risks beyond what your participants may encounter in everyday life, state that this is the case.
	We forsee no risks of legal, physical, psychological, or social harm or suffering to subjects or the environment resulting from this research. The task battery is administered via a well-tested platform with millions of daily users, and the tasks themselves are thoroughly tested, including via pilots conducted by the project. The tasks contain no material of an offensive or dangerous nature, and no sensitive information is gathered.
D.6	**Potential for harm to UCT or other institutions**
	Are there any foreseeable risks of harm to UCT, or to other institutions, that might result from or occur in the course of the research, for example, legal action resulting from the research; or the image of the university or another institution being adversely affected by association with the research (such as a school being compromised in the eyes of the Department of Education)? If your answer is 'Yes', give details below (to be balanced by your response to question D.8 below). Yes [ ] No [x]
D.7	**Other conceivable ethical issues**
	Are there any other ethical issues that you think might arise during the course of the research (e.g., with regard to conflicts of interest amongst participants and/or institutions)? If your answer is 'Yes', give details in the box below and say what you plan to do to minimise any adverse consequences (to be balanced by your response to question D.8 below). Yes [ ] No [x]
D.8	**Benefits to science, to participants and others**
	Summarize the benefits of your research. The core task of research ethics committees is to balance the benefits of research against risks or potential harm that may ensue, as per sections D.5, D.6, and D.7 of this form. In the space below summarise the benefits of your research. If appropriate, please also give some indication as to how you will provide feedback to the participants in your study.
	This study will provide the material for the Masters' thesis of Zach Colin Wolpe. Beyond that, the study results should demonstrate a relationship between working memory capacity and instrumental learning performance in the card sorting task: given the clinical significance of this task, such a result can have substantial benefit in the field of applied psychology / psychiatry. Furthermore, this study is a first stage in a larger project, and thus provides the foundation for a planned further study involving brain imaging (electroencephaolgraphy) to investigate the neural correlates of probabilistic models of instrumental learning. The latter study should provide insight into the basic science of the mechanisms of human learning, and may thus have substantial impact.

D.9	**Publication of results**			
	Research projects ideally result in publication of the results. Have you and your supervisor/PI read and agreed to the principles regarding authorship as set out in the UCT Authorship Practices Policy? This code is available for download from the UCT web-site's list of policies – scroll down the alphabetical listing to 'Research', where you will find this specific code http:// www.uct.ac.za/about/policies/			
	Yes	x	No	

E. SIGNATURES

E.1	**Endorsement by Applicant**			
	Title and Names	Zach Colin Wolpe		
	Signature		Date	25 March 2021
E.2	**Endorsement by Supervisor or Principle Investigator** By signing below, I certify that I have assisted the applicant to identify ethical issues pertaining to his or her research; that I have reviewed this ethics application, including the informed consent form overleaf, and am satisfied that it is accurate and adequately communicates information about the proposed research			
	Comments			
	Title and Names	**Dr Jonathan Shock**		
	Signature		Date	**18/5/2021**

DEPARTMENT OF STATISTICS

UNIVERSITY OF CAPE TOWN
PRIVATE BAG X3
RONDEBOSCH 7701
SOUTH AFRICA

RESEARCHER/S: Zach Wolpe
TELEPHONE: 0844968779
E-MAIL: Wlpzac001@myuct.ac.za
URL: http://www.stats.uct.ac.za/

Informed Voluntary Consent to Participate in Research Study

DynoCog: computational modelling of Optimal human learning in Dynamic Cognitive tasks

Invitation to participate, and benefits: You are invited to participate in a research study conducted with individuals. The study aim is to form a mathematical representation of human learning rates. I believe that your experience would be a valuable source of information, and hope that by participating you may gain useful knowledge.

Procedures: During this study, you will be asked to participate in a number of online games that measure your ability to learn rules.

Recording: We may take photographs and/or record audio/video as part of the study. These will be used to contrast your physiological responses to your task performance . If you object to this, please indicate below.

Risks: There are no potentially harmful risks related to your participation in this study.

Feedback: You will receive feedback about the results of this research in the following manner: via email.

Disclaimer/Withdrawal: Your participation is completely voluntary; you may refuse to participate, and you may withdraw at any time without having to state a reason and without any prejudice or penalty against you. Should you choose to withdraw, the researcher commits not to use any of the information you have provided without your signed consent. Note that the researcher may also withdraw you from the study at any time.

Confidentiality: All information collected in this study will be kept private in that you will not be identified by name or by affiliation to an institution. Confidentiality and anonymity will be maintained as pseudonyms will be used.

What signing this form means: By signing this consent form, you agree to participate in this research study. The aim, procedures to be used, as well as the potential risks and benefits of your participation have been explained verbally to you in detail, using this form. Refusal to participate in or withdrawal from this study at any time will have no effect on you in any way. You are free to contact me, to ask questions or request further information, at any time during this research.

I agree to participate in this research (tick one box) Yes No _____ (Initials)
I agree to be photographed Yes No _____ (Initials)
I agree to be audio-recorded Yes No _____ (Initials)
I agree to be video-recorded Yes No _____ (Initials)
I agree to the use of properly anonymized photographs/audio recordings/videos in the following way – in contrast with my task performance Yes No _____ (Initials)

_____	_____	_____
Name of Participant	Signature of Participant	Date

_____	_____	_____

Name of Researcher	Signature of Researcher	Date