**THE UNIVERSITY OF MELBOURNE**
**HUMAN RESEARCH ETHICS COMMITTEE**

# APPLICATION SUMMARY FOR
# APPROVAL OF HUMAN RESEARCH

## 1. ADMINISTRATION DETAILS

| | |
|---|---|
| **ETHICS ID:** | **2056826.1** |
| **TITLE:** | Identifying causes of events |

| | | | |
|---|---|---|---|
| **APPLICATION TYPE:** | **Minimal Risk** | **RESPONSIBLE RESEARCHER:** | Kemp, A/PROF Charles Stewart Charles |
| **RESPONSIBLE HEAG:** | Psychological Sciences | **HESC:** | Psychology Health and Applied Sciences |
| **ADMINISTERING DEPARTMENT:** | 5120 - Melbourne School Of Psychological Sciences | **ADMINISTERING CENTRE:** (if applicable) | |

## 2. MINIMAL RISK CHECKLIST REVIEW

The responses to the Minimal Risk Checklist are summarised below.

| | |
|---|---|
| **Risk Assessment Topics** | None identified |
| **Risk Assessment Procedures** | None identified |
| **Risks to Researchers** | None identified |
| **Vulnerability Assessment** | None identified |
| **Overseas Research** | None identified |

## 3. PROJECT DETAILS

**PROJECT TYPE:** Supervised Student Research Project - Masters by Research

**RESEARCH INVOLVES:** Locations other than/in addition to Uni of Melbourne

**BRIEF DESCRIPTION:** The project is about causal reasoning and aims to characterise how people identify the causes of an event. For example, an airplane crash could be attributed to pilot error, a faulty component, or an unexpected weather pattern, or some combination of the three. The project is designed to test a new theory of how causal judgments are influenced by temporal information

**PROPOSED DURATION OF WHOLE RESEARCH PROJECT:** From: APR-2020 To: DEC-2021

**PROPOSED DATE TO COMMENCE DATA COLLECTION:** 04-May-2020

## 4. PERSON DETAILS

Responsible Researcher

| Name | Kemp, A/Prof Charles | Department | 5120 - Melbourne School Of Psychological Sciences |
|---|---|---|---|
| **Person Type** | Staff | **Centre** | |

| Phone Number | +61383449009 | | Email Address | c.kemp@unimelb.edu.au |
|---|---|---|---|---|
| Qualifications | | Bachelors Degree, University of Melbourne<br>Bachelors Degree (Honours), University of Melbourne<br>Doctorate, Massachusetts Institute of Technology | | |
| Experience & Skills Relevant to the Project | | Charles is a cognitive scientist who has experience developing causal reasoning models, which will be applicable in this study. | | |
| Additional Training Required | | | | |
| Ethics Training Already Undertaken | | | | |

Student Researcher

| Name | Fermo, Aurã©Lien | | Department | |
|---|---|---|---|---|
| Person Type | Student | | Centre | |
| Phone Number | +33141160415 | | Email Address | aurelien.fermo@student.unimelb.edu.au |
| Qualifications | | | | |
| Experience & Skills Relevant to the Project | | Aurélien is a masters student with a background in psychology and computer science. | | |
| Additional Training Required | | | | |
| Ethics Training Already Undertaken | | | | |
| Student Supervisor(if applicable) | | Charles Kemp | | |

## 5. ADDITIONAL QUESTIONS

### 5.1 Location of Research

**Location Where Research Will Be Carried Out:**      Overseas

**Category of External Location:**      Other - Participants will take the experiment at their own computers.

### 5.2 Other Approvals Required (other than ethics clearances)

**Approvals Required:**      Not required

### 5.3 Other Ethic Clearances/Details of Multicentre Research

**Other Clearances Required:**      Not required
**Responsible HREC:**
**Comments:**

## 6. ATTACHMENTS

**PLEASE ENSURE YOU ATTACH A PAPER COPY OF EACH OF THE FOLLOWING ATTACHMENTS:**

| Category | Description | Attached Via Themis | Hard Copy Only |
|---|---|---|---|
| Application | | Yes | No |
| Consent Form | | Yes | No |
| Debriefing Statement | | Yes | No |
| Plain Language Statement | | Yes | No |

     Date: 15-APR-2020 14:57:14

THE UNIVERSITY C
MELBOURNE

**HUMAN RESEARCH ETHICS**

**PROJECT APPLICATION FORM**

## How To Use This Form

1.  **Consider and refer to relevant guidelines and regulations.**
    References to specific guidelines are provided, with hyperlinks, throughout this form. The primary guide for human research ethics in Australia is the **_National Statement on Ethical Conduct in Human Research (2007) - Updated 2018_**. Human research ethics applications at the University of Melbourne are reviewed and approved under the warrant of the *National Statement*. References to the *National Statement* are abbreviated (e.g. **NS §2.1**.)

2.  **Use plain English.**
    Use clear, non-technical language in your application. Be concise. Spell out the first instances of acronyms and abbreviations. Avoid jargon. Do not repeat information. Following these directions ensures effective review of your application. It will avoid unnecessary delays which result if applications are not clear and concise.

3.  **Consider ethical principles.**
    Your application will be reviewed according to the principles of ethical research outlined in the *National Statement*, namely:

    *   **Research Merit and Integrity** (**NS §1.1 - §1.3**)
    *   **Justice** (**NS §1.4 - §1.5**)
    *   **Beneficence** (**NS §1.6 - §1.9**)
    *   **Respect** (**NS §1.10 - §1.13**)

4.  **Use the current version of the application form.**
    Ensure that you are using the current version by downloading **this form** each time you prepare a new application.

5.  **Detailed instructions for specific questions are available online.**
    If you are unsure about how best to answer a particular question, consult the Human Research Ethics **Guidance Document**. That document provides detailed guidance on how to answer specific questions in this form.

6.  **Where possible, avoid printing this form.**
    Consult your HEAG to find out if they still require hard copies of your application. If you must print this form, consider printing double-sided and in grayscale (black and white).

7.  **Save your completed application as a PDF and upload it to Themis.**
    Refer to your local Human Ethics Advisory Group (**HEAG**) for detailed instructions on how and when to submit your application.

## <span style="color:red">ANSWER ALL OF THE QUESTIONS IN THIS FORM</span>

| | |
|---|---|
| **Ethics ID number:**<br>*(assigned by Themis)* | 2056826.1 |
| **Project Title:**<br>*(as recorded in Themis)* | Identifying causes of events |
| **Responsible Researcher:**<br>*(as recorded in Themis)* | A/Prof Charles Kemp |

| **Application Type:**<br>*(mark with an "X")* | X | **Minimal Risk** |
|---|---|---|
| | | **Standard Project** |

## 1. Project Details

| **1.1  Project Summary** | Summarise your research project in plain language.<br>**[Limit: 300 words]** |
|---|---|

### A)    Aims and Objectives

The project is about causal reasoning and aims to characterise how people identify the causes of an event. For example, an airplane crash could be attributed to pilot error, a faulty component, or an unexpected weather pattern, or some combination of the three. Causal judgements are involved in many contexts and often have real-world implications (e,g, legal implications in the case of the plane crash).

Causal judgments have been widely studied and there are existing models of "actual causation" (also known as "singular causation" or "token causation") that aim to capture people's inferences about the causes of a single event. Much of this work, however, does not focus on the role of time. In contrast, we have developed a model that aims to capture how causal judgments are influenced by temporal information, and in particular how people's judgments are influenced by changes of state over time. For example, suppose that an effect needs two different causes to occur --- e.g. an alarm may sound only if two different components both fail. If one of the components has already failed and the second one fails after a while, our model proposes that the failure of the second component will be judged as the primary cause of the effect.

### B)    Key Question(s)

1. Are people's causal judgments influenced by not just the values of all relevant variables at the time the effect occurs, but also the temporal order in which these variables took their values? [Hypothesis: Yes]
2. Does our new model account better for people's causal judgments than the two most prominent alternatives (the counterfactual account and the physical process account)? [Hypothesis: Yes]

### C)    Research Design

Participants will be recruited online via Amazon Mechanical Turk (AMT), Prolific or similar services.  After answering a few demographic (optional) and "check" questions designed to ensure they are fluent English speakers who read and understood their task, they will view a set of components (e.g. particle detectors) arranged into networks. Participants will view an animation that shows activation spreading over the network and culminating in the activation of a specified "final node." Participants will then be asked to pick out the node that caused the activation of the final node, or to rank possible causes in order of importance, and we will collect response times in addition to causal judgments. The same procedure will be repeated for multiple different networks that vary in terms of factors including the number of components they contain, the pattern of connections between these components, and the nature of these components. People will be paid at a rate of $10USD/hr, with an initial pilot being used to derive accurate time estimates.

## Specific Guidelines Checklist

Type an "X" in the left-hand column beside all items that apply to your research project. Linked sections of the National Statement contain relevant guidelines and requirements that you need to address when completing your application.

| | | |
|---|---|---|
| | **Children and/or young people (< 18 years old)** will be recruited as participants. | Refer to *NS §4.2*. |
| | **People in dependent or unequal relationships** will be recruited as participants.<br><br>(There are pre-existing relationships between participants and researchers, or between participants and others involved in facilitating or implementing the research. E.g. student/teacher, patient/doctor, employee/employer.) | Refer to *NS §4.3*. |
| X | **People in countries other than Australia** will be recruited as participants. | Refer to *NS §4.8*. |
| | One or more of the following describes the research project:<br><br>• it will be about **Aboriginal and/or Torres Strait Islander individuals or peoples**, their health, or their culture(s), language(s) or histories;<br><br>• it will be about the impact(s) or effect(s) of some phenomenon or phenomena on **Aboriginal and/or Torres Strait Islander individuals or peoples;**<br><br>• it will *specifically target* **Aboriginal and/or Torres Strait Islander people** to be recruited as participants;<br><br>• it will be conducted in a geographic location where a significant number of the population are likely to be **Aboriginal and/or Torres Strait Islander.** | Refer to *NS §4.7*.<br><br>Refer to *Ethical Conduct in Research with Aboriginal and Torres Strait Islander Peoples and Communities: Guidelines for Researchers and Stakeholders (2018)*.<br><br>Refer to **Guidelines for Ethical Research in Australian Indigenous Studies**<br><br>**This application is ineligible for minimal risk review.** |
| | One or both of the following describes the research project:<br><br>• it will *specifically target* **women who are pregnant** to be recruited as participants;<br><br>• it will be focused on **women who are pregnant and/or the human foetus** (including human foetal tissue or human embryos). | Refer to *NS §4.1*.<br><br>**This application is ineligible for minimal risk review.** |
| | **People who may be involved in illegal activities** will be recruited as participants, ***and the research project could potentially expose such activities.*** | Refer to *NS §4.6*.<br><br>**This application is *likely* ineligible for minimal risk review.** |
| | **People with cognitive impairment, intellectual disability, or mental illness** will be recruited as participants. | Refer to *NS §4.5*.<br><br>**This application is ineligible for minimal risk review.** |
| | **People who are highly dependent on medical care** will be recruited as participants. | Refer to *NS §4.4*.<br><br>**This application is ineligible for minimal risk review.** |
| | **None of the above** applies to this research project. | |

Comment on the above: The project will make use of Amazon's Mechanical Turk framework to recruit and remunerate participants in the experiment. We will use the infrastructure provided by AMT to ensure that only Americans can participate. The use of this framework is standard practice in many areas of psychology and the experiment will be conducted in full compliance with Amazon's Terms of Use for the Mechanical Turk platform. As far as we are aware, the Mechanical Turk system complies with all appropriate legislation and ethical procedures within the regions it operates.

## Additional Modules Checklist

**Type an "X" in the left-hand column beside all items that apply to your research project.** This checklist will help you determine if you need to complete any other modules in addition to this application form. Linked sections of the *National Statement* contain relevant guidelines and requirements that you need to address when completing this form and any applicable additional modules.

| | | |
|---|---|---|
| | This research project will involve the **creation of a databank** (i.e. your stored data will be made available to other parties for secondary use in future research projects). | **Refer to NS §3.1.**<br><br>**Complete and attach the *Privacy and Databanks Module*.** |
| | This research project will involve the **collection of information for a databank** (i.e. your stored data will be made available to other parties for secondary use in future research projects). | **Refer to NS §3.1.**<br><br>**Complete and attach the *Privacy and Databanks Module*.** |
| | This research project will involve **accessing information from an existing databank** (i.e. you will be accessing and making use of stored data that was previously collected – not for this specific project – by other parties). | **Refer to NS §3.1.**<br><br>**Complete and attach the *Privacy and Databanks Module*.** |
| | This research project will involve obtaining identifiable (or potentially identifiable) **personal information (including health information)** about individuals *without their consent.* | **Complete and attach the *Privacy and Databanks Module*.** |
| | This research project will involve the collection and/or use of **human tissue/biological samples or materials** (e.g. blood, saliva, cheek swabs, hair, human embryonic or foetal tissue). | **Refer to *NS §3.2*.**<br><br>**Complete and attach the *Body Tissue and Genetic Research Module*.** |
| | This research project will involve **genomic research**. | **Refer to *NS §3.3*.**<br><br>**This application is ineligible for minimal risk review.**<br><br>**Complete and attach the *Body Tissue and Genetic Research Module*.** |
| | This research project will involve **medical interventions, therapies or trials.** | **Refer to *NS §3.1*.**<br><br>**This application is ineligible for minimal risk review.**<br><br>**Complete and attach the *Interventions, Therapies and Trials Module*.** |
| | This research project will involve **administration of ionising radiation.** | **Complete and attach the *Ionising Radiation Module*.** |
| **X** | **None of the above** applies to this research project. | |

Comment on the above: All data will be non-identifiable and not added to a databank (defined in NS §3.2 as data that is aggregated over time). The data may be made available in completely anonymous and non-identifiable form to other researchers.

# 2. Background and Method

| **2.1 Background and Significance** | Provide a summary of background information. Explain the significance of the proposed research in the context of this background. **Refer to *NS §5.2.5* and *NS §3.1***<br>**[Limit: 500 words]** |
|---|---|

### A)    Background:

Current research on actual causation mainly relies on two different interpretations of causality: the counterfactual account (CF) or the physical process (PP) view. According to the first interpretation (Hume 1774, Lewis 1973, Halpern & Pearl 2005, Icard & al. 2017, Morris & al. 2019), A is said to be a cause of B if and only if A is true and B is true, and A hadn't occurred B wouldn't have occurred. According to the second interpretation (Russell 1912, Walsh & Sloman 2011, Dowe 2004, Wolff 2007), effects have to be physically connected to their causes. In some contexts it has been shown (Hall 2004, Danks 2017) that intuitve causal judgments can be explained by the CF account and not the PP one or the other way around. Yet it appears that none of these accounts can fully explain causal judgements in general. For example suppose that Suzy and Bob throw

a rock at a bottle and that Suzy's rock reaches the bottle just a second before Bob's. According to the CF account, in its simplest formulation, Suzy's throw does not cause the bottle to shatter because if Suzy hadn't thrown her rock, Bob's rock would have still shattered the bottle. However according to the PP account, Suzy's throw is the cause because the rock transmits energy to the bottle which causes it to shatter. In other cases, however it is the PP account that contradicts strong causal intuitions. Suppose that Suzy is now piloting a bomber on a mission to destroy an enemy target. An enemy fighter aircraft is about to shoot her, but Bob who is escorting her destroys the enemy plane which allows Suzy to bomb the target. In this case Bob prevents the enemy from preventing the success of Suzy's mission. The CF account says that Bob's action (of killing the enemy plane) is a cause of the mission success, whereas the PP account denies it.

## B)    Significance of This Research:

The project aims at solving the dilemma above by interpreting causality in a completely different way, that is by considering causes as changes of states over time. This approach has some precedent in the literature (Glymour 2010, Gerstenberg 2015) but has not been developed carefully and has never been tested experimentally as we intend to do. The approach states that neither CF nor PP accounts of causation can fully capture our causal intuitions because both treat causality as a relationship between static states. In contrast, we focus on events that are changes of state, and identify causes by tracing back the history of changes in a system from the occurrence of the effect up to the last change that initiated the series of changes. This framework aims to synthesize key ideas captured by the CF and PP accounts of causation, but needs to be experimentally tested − which is the goal of the project.

Danks D. Singular Causation. In M. R. Waldmann (Ed.), Oxford library of psychology. The Oxford handbook of causal reasoning, 201–215, Oxford University Press, 2017

Dowe P. Causes are physically connected to their effects : Why preventers and omissions are not causes. In Christopher Hitchcock (ed). *Contemporary Debates in Philosophy of Science*. Blackwell. 189-196, 2004

Gerstenberg T., Goodman N., Lagnado D., Tenenbaum J. How, whether, why: Causal judgments as counterfactual contrasts. 2015

Glymour C., Danks D., Glymour B., Eberhardt F., Ramsey J., Scheines R., Spirtes P., Teng C.M., Zhang, J. Actual causation: A stone soup essay. *Synthese*, 175(2), 169-192, 2010

Hall N. Two Concepts of Causation. In J. Collins, N. Hall, and L. A. Paul (eds.), Causation and Counterfactuals, Cambridge, MA: The MIT Press, pp. 181–204, 2004

Halpern J.Y. and Pearl J. Causes and explanation : A structural-model approach, Part I: Causes. *The British Journal for the Philosophy of Science*, 56, 889-911, 2005

Hume D. An enquiry concerning human understanding. Oxford : Clarendon, 1774

Icard T.F., Kominsky J.F, Knobe J. Normality and actual causal strengh. Cognition 164, 80-93, 2017

Lewis D. Causation. *Journal of Philosophy*, 70, 556-567, 1973

Morris A., Phillips J., Gerstenberg T., Cushman F. Quantitative causal selection patterns in token causation. PloS ONE 14(8), 2019

Russell B. On the Notion of Cause, in J. Slater (ed.), The Collected Papers of Bertrand Russell v6: Logical and Philosophical Papers 1909–1913, London: Routledge Press, pp. 193–210,1912

Walsh C.R., Sloman S.A. The meaning of cause and prevent: The role of causal mechanism. *Mind & Language*, 26(1):21–52, 2011

Wolff P. Representing causation. *Journal of Experimental Psychology: General*. 136(1):82-111, 2007

| | | |
|---|---|---|
| **2.2 Research Design and Method** | Provide details of your research design and your proposed method. **Refer to NS §5.2.5 - §5.2.6** and **NS §3.1** | |
| | **Attach a copy of any measures, scales, questionnaires, survey instruments (including online surveys), interview questions/themes, and/or focus group topics/questions to be used.** | |

## A)    Participants (or Recruitment Targets, such as medical records):

In order to obtain reliable and robust feature ratings, we will recruit around 50 participants per condition using Amazon's Mechanical Turk (AMT), which provides a platform for recruiting workers to carry out online tasks that require human intervention, in exchange for payment. Participants will be registered "Workers" within the AMT platform; most Workers contribute to AMT to make some extra money. All AMT workers are restricted to be 18 years of age or older. Our check items will ensure that they are fluent speakers of English.

Eligibility restrictions include the ability to read and understand the questions, which is ensured by through the use of a short qualification which workers have previously passed checking their English ability. We will also have "check questions" within the experiment which participants cannot continue without getting correct. Participants will be informed before commencing the experiment that they may be excluded if they are not operating a web browser compatible with the software used to implement the experiment. In practice, in the event that a participant carries out the experiment using a non-compliant browser, full payment will still be made.

## B)    Recruitment:

On AMT Workers are never contacted directly; rather, experiments are posted on the AMT platform as part of the list of tasks available for Workers to perform. Workers select which tasks they wish to contribute to and may return them without completion at any time without penalty.

### C)  Participant Incentives:

Workers within Amazon's Mechanical Turk platform conduct tasks in exchange for payment, which is based on task rather than time. We set the rate of payment such that the average participant will receive an amount approximately equivalent to US $10.00 per hour, which is well above the "market rate" established for tasks on Mechanical Turk and above the minimum wage in most US states.

### D)  Participant Task(s):

Participants will view animations showing activation spreading over networks of nodes up to a final node. They will be asked to click on the node(s) of the graph they will judge as the main cause(s) of the activation of the final node. Participants will be assigned to conditions that vary the nature of the nodes (e.g. whether an active node remains active over time or resets to a default stage), the structure of the network (e.g. whether the nodes are organized into chains or loops), and the timing of activations over the network.  The conditions are designed to include cases that allow our new theory to be distinguished from two existing theories (the counterfactual and the physical process accounts).

### E)  Data/Material Collection Technique(s):

The survey will be coded in Javascript, which ensures precise control over characteristics such as randomisation, dependencies between questions, and presentation format. Data will consist of answers to the questions above as well as (completely optional) demographic questions including age, and gender. The software used to run the experiment will be deployed within Google's "App Engine" framework, although it will be accessed via Mechanical Turk. The Google App Engine framework has an associated database engine where the anonymous data will be stored. Access to this database is secure and will be restricted to the researchers. Once data has been downloaded from Google App Engine for analysis, it will be stored on secure computers in compliance with University data protocols. The data will also be backed up and held on University servers and may be made available in a non-identifiable form to the academic community (e.g., through github).

### F)  Data Analysis:

Participant responses will be analysed statistically using Python. Statistical analyses may include frequentist or Bayesian statistics, as appropriate.

# 3. Risks, Benefits and Monitoring

| 3.1 Potential Risks to Participants | Does your research project pose any potential risks to participants? What are those risks? How will they be negated, minimised or managed? **Refer to *NS* §2.1.**<br><br>**Note that the risks you identify here should also be described in your Plain Language Statement (PLS). Attach a copy of any distress protocol or adverse event protocol (if applicable).** |
|---|---|

### A)  Potential Risks

We foresee minimal risk to participants associated with study conduct. The main risk we anticipate is a mild level of boredom, since the task is fairly dull.

### B)  Risk Management Strategy

To address the risk of boredom participants will be informed that they are not required to complete the study and that they are permitted to stop at any time. Before choosing to participate in the study they will also be shown an estimate of how long it will take and how much money they can expect to earn.

| 3.2 Potential Risks to Non-Participants | Does your research project pose any potential risks to non-participants? (This could possibly include risks to researchers or independent contractors.) If so, how will these risks be minimised? **Refer to *NS* §2.1.** |
|---|---|

None.

| 3.3 | Risks, Benefits and Justification | In light of the risks and expected benefits of the research project, explain how the expected benefits of the research justify any risks it may pose. **Refer to *NS* §1.6 - §1.7 and *NS* §2.1**. |
|---|---|---|

**A)     Expected Benefits**

Taking into account the notion of changes over time as the core representation of causation departs clearly from the current views of causality and may have important implications. For example, two stories with the same causal structure (same facts, same effects) but with different temporal contrasts regarding the occurrence of the events may imply totally different causal judgements. A better understanding of the role of temporal contrasts in causal judgements could therefore mitigate bias and improve concrete decisions based on causal reasoning (e.g. legal decisions in the case of the airplane crash).

**B)     Justification of Risks by Expected Benefits**

The risks are minimal and the expected benefits large – as mentioned already the work can potentially help to improve real-world causal decisions.

<br>

| 3.4 | Management and Monitoring | How will researchers manage and monitor conduct of the research project? **Refer to *NS* §5.5**. |
|---|---|---|

**A)     Management**

*A/Prof Charles Kemp will keep all data on a password-protected computer associated with the University of Melbourne and will be responsible for storage, making the data available to student researchers for analysis (who will also use password-protected computers). In order to ensure that the research protocol is correctly followed, the responsible researcher will meet with the student on a regular basis throughout the duration of the project. Before being downloaded the data will be hosted on Google App Engine but destroyed once it is downloaded. The data may also be made available (e.g., on github) in anonymised and de-identified form (since AMT prohibits researchers from accessing personal information about participants, this will be trivial).*

**B)     Monitoring**

Research is carried out by people clicking on a URL and completing it in their home. No monitoring is necessary.

**C)     Independent Contractors**

No independent contractor will be carrying out any part of the research.

# 4. Consent

| 4.1 | Obtaining Informed Consent | **Type an "X" in the left-hand column beside as many of the following options as apply** to your research project. **Use the space provided below** to explain how you will obtain informed consent from participants. If you seek a waiver of consent, or the use of opt-out consent, use the space provided to justify your request. **Refer to *NS* §2.2, *NS* §2.3**. |
|---|---|---|
| X | **Written consent** will be sought from (or on behalf of) participants. | Refer to *NS* §2.2.6.<br><br>**Attach a copy of your consent form(s).** |
|  | **Verbal consent** will be sought from (or on behalf of) participants. | Refer to *NS* §2.2.5 - §2.2.6.<br><br>**Explain why you have chosen this form of consent, and how an individual's consent to participate will be recorded.**<br><br>**Attach a copy of your consent script(s).** |
|  | **Consent will be implied,** rather than explicitly obtained. | Refer to *NS* §2.2.5 - §2.2.6.<br><br>**Explain why you have chosen this form of consent.** |
|  | **Third parties (e.g. parents/guardians of minors) will provide consent** on behalf of participants. | Refer to *NS* §2.2.12.<br><br>**Explain who will be providing consent on behalf of participants and why.** |

| | Third parties (e.g. community elders, school boards) will be involved in whole of community participation decisions. | Refer to *NS §2.2.13*.<br><br>Provide details of which third parties will be involved, why they will be involved, and how this will be accomplished. |
|---|---|---|
| | This application seeks a **waiver of consent**. | Explain why you are seeking this option. Justify your request by referring to the conditions described in *NS §2.3.10 - §2.3.11*. |
| | This application proposes to use **opt-out consent**. | Explain why you are seeking this option. Justify your request by referring to the conditions described in *NS §2.3.6*. |

Consent will be achieved online by having participants click 'Next' after response to the consent form, a copy of which is attached to this application.

| **4.2 Limited Disclosure** | Do you propose to use limited disclosure, concealment or deception for this research project? (Answer Yes or No. If Yes, use the space below to explain.) **Refer to *NS §2.3*.** | |
|---|---|---|
| | **YES or NO:** | NO |
| | | |

| **4.3 Future Use of Data, Materials, or Tissues** | Do you intend for the data and/or materials and/or tissues collected for this research project to be reused in future research? **Type an "X" in the left-hand column beside as many of the following options as apply** to your research. **Use the space provided** to specify which data/materials/tissues will be reused, if any. **Refer to *NS §2.2.14* and *NS §3.1*** | |
|---|---|---|
| | Consent will be **specific.** | Data/materials/tissues will be used *only* for this research project (i.e. **no future use**). |
| | Consent will be **extended.** | Data/materials/tissues used in this research project may also be used in future projects that are *closely related* to this project, *or in the same general area* of research as this project. Make this clear in PLS |
| **X** | Consent will be **unspecified.** | Data/materials/tissues used in this project may also be used in *any* future research. Make this clear in PLS |

Data may be made publicly accessible via a suitably open format and platform (e.g., OSF or github), in accordance with ARC requirements. However, information that may be used to identify individual participants will not be available.

| **4.4 Conflict of Interest** | Does your research present or involve any conflict of interest, whether potential, real, or perceived; or will the researcher(s) have dual roles in relation to the participants? (Answer Yes or No. If Yes, use the space below to explain.) **Refer to *NS §5.4*, *University of Melbourne Research Integrity and Misconduct Policy (MPF1318)*, and *Australian Code for the Responsible Conduct of Research* §7.2.** | |
|---|---|---|
| | **YES or NO:** | NO |

*There are no conflicts of interest. All participation is anonymous and voluntary. Researchers have no association with Amazon.*

| 4.5 Information for Participants | How will relevant information about the research project be provided to potential participants? **Attach a copy of any advertisement (print or online), Plain Language Statement (PLS), consent form, letter, email, telephone script, and/or debriefing statement** to be used. **Refer to [NS §5.2.25](#) and [NS 3.1](#)** |
|---|---|

Information as provided in the attached PLS and consent form will be provided to each participant at the link of the study URL. They will be unable to continue to the study until they click a button attesting that they have read and comprehended the information in the PLS and consent form.

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*Plain Language Statement (PLS):* Your PLS must satisfy the requirements set out in the *National Statement* (**[NS §2.2.1 - §2.2.3, §2.2.6](#)**). The Research Ethics and Integrity's website has **[guidance on composing your plain language statement](#)**, as well as an **[example PLS template](#)**. A list of PLS requirements is also provided at the end of this form. ***Ensure that your PLS is written in plain language. Ensure that the information contained in your PLS is consistent with the information in your application.***

*Consent Form:* Your consent form must satisfy the requirements set out in the *National Statement* (**[NS §2.2](#)**). The Research Ethics and Integrity's website has **[guidance on composing your consent form](#)**, as well as an **[example consent form](#)**. A list of consent form requirements is also provided at the end of this form. ***Ensure that your consent form is written in plain language. Ensure that the information contained in your consent form is consistent with the information in your application.***

# 5. Dissemination and Data Management

| 5.1 Providing Results to Participants | How will the results of the research project be provided to participants in an accessible format? **Refer to [NS §1.5](#) and [NS 3.1](#)** |
|---|---|

Since participation is anonymous, none of the specific results will be made available to specific people. When published, information about the publication will be posted on the websites of the researchers involved, whose names participants will have been made aware of, so that interested participants may seek it out.

| 5.2 Reporting Project Outcomes | How will outcomes of the research project be made public? **Refer to [NS §1.3](#) and [NS 3.1](#)** |
|---|---|

If successful, the project will be published in a high-quality scientific journal such as Psychological Science or Cognition, with the manuscript posted on the authors' websites in compliance with copyright requirements. Results will also be shared with other researchers through informal networks and conference presentations.

| 5.3 Data Management | How do you propose to manage the data collected in this research project? Specify what types of data will be collected, how they will be stored and in what format. How will access to the data be controlled and by whom? Discuss retention, security, and data sharing plans. What measures will be taken to protect participants' privacy, and their data? <br><br> **Refer to [NS §1.11](#), [NS 3.1](#), the [*Australian Code for Responsible Conduct of Research §2*](#), and the [University of Melbourne Research Integrity and Misconduct Policy (MPF1318)](#).** |
|---|---|

### A)    Privacy and Confidentiality

Data will be anonymous and not identifiable. Researchers do not have access to specific identity information of any researcher and the only demographic questions are generic enough (e.g., age and gender) to not uniquely identify specific people; moreover, anyone may refuse to answer any demographic questions without penalty.

### B)    Security and Storage of Data

Short-term storage of the data will be on the researchers' password-protected computers. In the long term, the data will be stored on secure servers hosted by the Melbourne School of Psychological Sciences and a non-identifiable version of the data may be made available online.

**C)    Retention**

Records will be retained for a minimum of five years following publication of study findings.

# 6. Other Issues

| **6.1 Other Ethical Issues** | Are there any other issues, not addressed above or in additional modules, which are relevant to the ethical review of your research project? **Refer to the relevant sections of the *National Statement* identified in the Specific Guidelines Checklist, if applicable.** |
|---|---|

None.

| **Attachments Checklist** | | |
|---|---|---|
| Review your answers above to determine which attachments (if any) are required for your application. **Type an "X" in the left-hand column beside all items that apply to your research project.** Attach a copy of the items you have selected. | | |
| **X** | | **Plain Language Statement (PLS) for Participants** |
| **X** | | **Consent Form for Participants** |
| | | **Additional PLS(s)** (e.g. for parents, teachers, schools) |
| | | **Additional Consent Form(s)** (e.g. for parents, teachers, schools; or assent forms for children) |
| | | **Recruitment Materials** (e.g. advertisement(s), posters, letter(s) or email(s) of invitation) |
| | | **Questionnaire(s) and/or Survey Instrument(s)** |
| | | **Measure(s) and/or Scale(s)** |
| | | **List of Interview Questions and/or Themes** |
| | | **List of Focus Group Questions and/or Themes** |
| | | **Participant Distress Protocol** |
| | | **Adverse Event Protocol** |
| **X** | | **Debriefing Statement** |
| | | **Approval(s) of research by an HREC external to the University of Melbourne** |
| | | **Other External Approval(s)** (e.g. schools, communities) |
| | | **Full Protocol** (for Medical Research) |
| | | **Translations and/or Back-Translations** (where languages other than English used) |
| | | **Privacy and Databanks Module** |
| | | **Body Tissue and Genetic Research Module** |
| | | **Ionising Radiation Module** |

| | **Interventions, Therapies and Trials Module** |
|---|---|
| | **Other Documents** (e.g. contracts, agreements) – specify which: |
| | |

**Plain Language Statement (PLS) Requirements:**

1.  Clearly identify the University of Melbourne (i.e. by prominent placement of the University's logo) and the department(s)/ school(s)/faculty(-ies) involved. If printed, the PLS should be on University of Melbourne letterhead.

2.  Clearly identify the title of the project, and the name(s) and contact details of the Principal Researcher and Other Researchers. For student projects, specify the student's level of study.

3.  Clearly explain the purpose of the research project.

4.  Clearly explain what participants will be asked to do, and provide an estimated time commitment.

5.  If participants will be photographed, audio- or video-recorded, clearly state as much.

6.  Clearly explain any risks arising from participation, as well as any procedures or measures in place to minimise such risks.

7.  Describe any expected benefits to the wider community. If applicable, also describe any expected benefits to participants.

8.  List any payments, incentives or reimbursements to be made to participants.

9.  State that involvement in the project is voluntary and that participants are free to withdraw from participation at any time. Explain any implications of withdrawal, including whether it will be possible for participants to withdraw any data already collected from or about them.

10. Describe the likelihood and form of dissemination of the research results, including publication.

11. Describe the arrangements in place to protect the confidentiality of participants' data, and advise participants of any legal limitations to such confidentiality. If the sample size for the project is small, advise participants that this may make them identifiable.

12. The project HREC number (which is the ethics ID number assigned by Themis) and the date and version number of the PLS must appear on the PLS. If the PLS is printed, put this information in the footer.

13. Explain what will happen to participants' data after the research project ends (i.e. how long it will be retained, whether it might be used again for future research and if so who would have access.)

14. Include the following statement: "This research project has been approved by the Human Research Ethics Committee of The University of Melbourne. If you have any concerns or complaints about the conduct of this research project, which you do not wish to discuss with the research team, you should contact the Manager, Human Research Ethics, Research Ethics and Integrity, University of Melbourne, VIC 3010. Tel: +61 3 8344 2073 or Email: **humanethics-complaints@unimelb.edu.au** All complaints will be treated confidentially. In any correspondence please provide the name of the research team or the name or ethics ID number of the research project."

15. If the research is externally funded, state the amount(s) and source(s) of funding for the research.

16. If there are any potential conflicts of interest for any of the researchers, sponsors (if applicable) or institutions, disclose these potential conflicts of interest.

17. If any participants will be in a dependent relationship with any of the researchers, state that decisions about participation will not affect the dependent relationship. (E.g. students' grades will not be affected if they decline to participate or withdraw from the project at any stage).

**Consent Form Requirements:**

1.  Clearly identify the University of Melbourne (i.e. by prominent placement of the University's logo) and the department(s)/ school(s)/faculty(-ies) involved. If printed, the consent form should be on University of Melbourne letterhead.

2.  Clearly identify the title of the project, the name(s) and contact details of the Principal Researcher and Other Researchers. For student projects, specify the student's level of study.

3.  If participants will be photographed, audio- or video-recorded, clearly state as much.

4.  State that involvement in the project is voluntary and that participants are free to withdraw consent at any time, and to withdraw any unprocessed data previously supplied. Also state that the purpose of the project is research.

5.  Describe the arrangements in place to protect the confidentiality of participants' data, and advise participants of any legal limitations to such confidentiality. If the sample size for the project is small, advise participants that this may make them identifiable.

# Declaration by the Responsible Researcher

The information contained in this application is, to the best of my knowledge and belief, accurate.

I have read the University's current human ethics guidelines. I accept responsibility for the conduct of the procedures set out in the attached application in accordance with: those guidelines, with the ***University's Research Integrity and Misconduct Policy (MPF1318)***, and with any other condition laid down by the University of Melbourne's Central Human Research Ethics Committee (CHREC), its Human Ethics Sub-Committees (HESCs), or by the Human Ethics Advisory Group (HEAG) which will review this application. I have attempted to identify all risks related to the research that may arise in conducting this research. I acknowledge our obligations as researchers and the rights of the participants stipulated in the ***National Statement on Ethical Conduct in Human Research (2007) - Updated 2018***. I certify that the research team has the appropriate qualifications, experience and facilities to conduct the research described in the attached application, and to deal with any emergencies and contingencies related to research that may arise throughout the life of the project.

If approval is granted, the project will be undertaken in strict accordance with the approved protocol and relevant laws, regulations and guidelines.

I, the Responsible Researcher, agree to:

* start this research project <u>only</u> after obtaining final approval from the HESC (if this is a standard project), or the HEAG (if this is a minimal risk project);

* carry out this research only where adequate funding is available to enable the research to be carried out according to good research practice and in an ethical manner;

* provide additional information as requested by the CHREC, HESC, or HEAG;

* provide progress reports to the CHREC, HESC, or HEAG as requested, including annual and final reports;

* maintain the confidentiality of all data collected from, or about, research participants and maintain security procedures for the protection of their privacy;

* submit an amendment if any modification to the research design or protocol is proposed (including any change of researchers) <u>and</u> to proceed with the research <u>only after</u> the amendment has been approved by the HESC (if this is a standard project) or by the HEAG (if this is a minimal risk project);

* notify the HESC (if this is a standard project) or the HEAG (if this is a minimal risk project) in writing immediately if any adverse event occurs during the course of the research;

* notify the HESC (if this is a standard project) or the HEAG (if this is a minimal risk project) in writing immediately if any complaints are received about the research;

* comply with an audit of the research undertaken, if requested by the CHREC, HESC, or HEAG;

* use only the data/tissue samples collected for this research, and for which HESC/HEAG approval has been given.

I certify that all members of the research team have read this application and the ***National Statement on Ethical Conduct in Human Research (2007) - Updated 2018*** and that they have agreed to comply with the provisions of the latter.

| Responsible Researcher Name | Signature | Date |
|---|---|---|
| Charles Kemp | *CSKemp* | 10/4/20 |

# Declaration by Human Ethics Advisory Group (HEAG)

<table>
<tr><td colspan="2"><strong>For HEAG use only.</strong><br><br>Enter the date the application was received, then type an "X" in the left-hand column beside each item as applicable.<br><br><strong>Date Application Received:</strong></td><td></td></tr>
<tr><td></td><td><strong>Technical review</strong> has been completed by the HEAG.</td><td>The merit of the proposed research project set out in this application has been reviewed on technical grounds.<br><strong>Refer to <span style="color:blue">NS §1.1</span>.</strong></td></tr>
<tr><td></td><td><strong>Ethical review</strong> has been completed by the HEAG.</td><td>The HEAG has reviewed the proposed research project set out in this application for compliance with the principles of Human Research Ethics.</td></tr>
<tr><td></td><td>The <strong>Minimal Risk</strong> review process is appropriate for the proposed research project set out in this application.</td><td><strong>Complete Declaration A (below)</strong></td></tr>
<tr><td></td><td>The <strong>Standard Project</strong> review process is appropriate for the proposed research project set out in this application</td><td><strong>Complete Declaration B (below)</strong></td></tr>
</table>

<table>
<tr><td><strong>Declaration A (Minimal Risk):</strong></td><td>The HEAG has reviewed this project. The HEAG considers the methodological/technical and ethical aspects of the proposal to be appropriate to the tasks proposed. <strong>The HEAG grants approval for this research project to commence.</strong> The HEAG considers that the researcher(s) has/have the necessary qualifications, experience and facilities to conduct the research described in the attached application in a manner that complies with the University's policy on the management of research data and records, and to deal with any emergencies and contingencies that may arise. <em>[Note: If the HEAG Chair is also a researcher in this project, the declaration should be signed by another authorised member of the HEAG.]</em></td></tr>
</table>

| Name of HEAG Chair/Authorised Member | Signature | Date |
|---|---|---|
|  |  |  |

<table>
<tr><td><strong>Declaration B (Standard Project):</strong></td><td>The HEAG has reviewed this project and considers the methodological/technical and ethical aspects of the proposal to be appropriate to the tasks proposed. <strong>The HEAG regards this project as ready to submit to the HESC.</strong> The HEAG considers that the researcher(s) has/have the necessary qualifications, experience and facilities to conduct the research described in the attached application in a manner that complies with the University's policy on the management of research data and records, and to deal with any emergencies and contingencies that may arise. <em>[Note: If the HEAG Chair is also a researcher in this project, the declaration should be signed by another authorised member of the HEAG.]</em></td></tr>
</table>

| Name of HEAG Chair/Authorised Member | Signature | Date |
|---|---|---|
|  |  |  |

# Melbourne School of Psychological Sciences

## Plain Language Statement

PROJECT TITLE: *Identifying causes of events*

**Aurélien Fermo (Responsible Researcher)**
Tel: +33 642 249 420; email: aurelien.fermo@ens.fr
**A/Prof Charles Kemp (co-researcher)** email: c.kemp@unimelb.edu

### Introduction
You are invited to participate in a study of how people make causal judgments. The goal of this project is to better understand how people determine the cause or causes of an effect.

### What will I be asked to do?
After answering some optional demographic questions, if you decide to participate, you will be shown animated graphs which will represent activation spreading over networks of detectors. You will have to identify which detector or detectors you consider to be the main cause of the activation of the final detector. Detailed instructions will be provided once the task begins.

### What are the risks?
Risks are minimal.

### What are the benefits?
This experiment will characterize some of the factors that influence how people identify the causes of an effect. You will be paid for your contribution at a rate of $10/hr.

### How would my confidentiality be protected?
As an Amazon Worker, we do not have access to identifying personal details. Before the task you will be asked to contribute some demographic details but responding to this question is optional. Our sample size will be large, making it even more difficult to identify any one person.

### What if I want to withdraw from the Research?
Participation in this research is completely voluntary. Your data will not be used in the full sample unless you complete the experiment.

### Where can I get further information?
This research project has been approved by the Human Research Ethics Committee of The University of Melbourne. If you have any concerns or complaints about the conduct of this research project, which you do not wish to discuss with the research team, you should contact the Manager, Human Research Ethics, Research Ethics and Integrity, University of Melbourne, VIC 3010. Tel: +61 3 8344 2073 or Email: humanethics-complaints@unimelb.edu.au All complaints will be treated confidentially. In any correspondence please provide the name of the research team or the name or ethics ID number of the research project.

### How do I agree to participate?
If you wish to participate please read and click 'Next' after reading the consent form on the next page.

# Melbourne School of Psychological Sciences

# Consent form for persons participating in a research project

PROJECT TITLE: *Identifying causes of events*

**Aurélien Fermo (Responsible Researcher)**
Tel: +33 642 249 420; email: aurelien.fermo@ens.fr
**A/Prof Charles Kemp (co-researcher) email: c.kemp@unimelb.edu**

1.   I consent to participate in this project. The purpose of this research is to acquire information about how people make causal judgments.

2.   I understand that this project is for research purposes only. It is expected that the results of this study will be presented at conferences and published in a peer-reviewed journal.

3.   In this project I will be given some optional demographic questions and then shown a series of animations which will show nodes in a network being activated. For each animation I will be asked to select the node(s) that caused the activation of the final node. The details of this have been explained in the statement on the previous page.

4.   I understand that there are risks involved in participating in this research project, although they are minimal; the largest risk is a mild degree of boredom. The length of the study was specified on a previous page.

5.   My participation is voluntary and I am free to withdraw from the project at any time without explanation or prejudice and to withdraw any unprocessed data I have provided. Withdrawing from the project will not affect my relationship with any person.

6.   I have been informed that the data from this research will be stored at the University of Melbourne and may be made available in de-identified form to the scientific community.

7.   I have been informed that the confidentiality of the information I provide will be safeguarded subject to any legal requirements. My data is anonymous and not linked to any personal information at any time.

By clicking the "Next" button I give my consent to participate in this project.

# Melbourne School of Psychological Sciences
# Debriefing Statement

PROJECT TITLE:  *Identifying causes of events*

**Aurélien Fermo (Responsible Researcher)**
Tel: +33 642 249 420; email: aurelien.fermo@ens.fr
**A/Prof Charles Kemp (co-researcher)** email: c.kemp@unimelb.edu

## Thank you for participating in our study!

The study was pretty straightforward so there's not much more to say, but in case you're interested in more of the background, here it is:

As mentioned at the beginning of this experiment, we are interested in understanding how people identify the cause or causes of an effect. Two existing theories make predictions about these judgments. Suppose for example that Suzy throws a rock at a bottle and breaks it. One approach states that if Suzy hadn't thrown the rock, the bottle wouldn't have shattered, and then concludes that Suzy's throw is the cause of the bottle shattering. The other approach says that Suzy's throw caused the bottle to shatter because the rock transmitted energy to the bottle.

The two theories agree in this simple example but in other contexts they disagree. For instance, suppose that Suzy is piloting a bomber with the goal of destroying an enemy target. On her trajectory she meets an enemy fighter aircraft that is about to intercept her, but Bob who is escorting her shoots the enemy and Suzy succeeds in destroying the target. The first theory states that Bob's action is a cause of the destruction of the target, but the second one states that the only cause of the target's destruction is Suzy's action, because this is the only action physically connected to the dropping of the bomb. If you are interested in these two competing theories, you can read more at https://www.andrew.cmu.edu/user/ddanks/papers/SingularCause-Final.pdf

The experiment you just did is designed to test a new theory of causation that focuses on changes of state. An effect (e.g. the activation of a detector) is a change of state, and we propose that when an effect occurs people identify a sequence of changes that led to the effect, and identify the first change in the sequence as the primary cause of the effect. In some cases this theory makes predictions that differ from the two standard theories already described, and the experiment you did includes questons that are designed to distinguish between these competing theories

As always we are very grateful for your thoughtful responses, as they tell us a great deal about how humans think and reason.