Northeastern University
Human Subject Research Protection
960 Renaissance Park
Northeastern University
Boston, MA 02115-5000
Tel: 617.373.7570; Fax: 617.373.4595

For NU IRB use:

Date Received: _____ *NU IRB No.* _____

Review Category: _____ *Approval Date* _____

APPLICATION FOR APPROVAL FOR USE OF HUMAN PARTICIPANTS IN RESEARCH

Before completing this application, please read the Application Instructions and *Policies and Procedures for Human Research Protections* to understand the responsibilities for which you are accountable as an investigator in conducting research with human participants. The document, *Application Instructions*, provides additional assistance in preparing this submission. ***Incomplete applications will be returned to the investigator. You may complete this application online and save it as a Word document.***

If this research is related to a grant, contract proposal or dissertation, a copy of the full grant/contract proposal/dissertation must accompany this application.

Please carefully edit and proof read before submitting the application. Applications that are not filled out completely and/or have any missing or incorrect information will be returned to the Principal Investigator.

REQUIRED TRAINING FOR RESEARCH INVOLVING HUMAN SUBJECTS

Under the direction of the Office of the Vice Provost for Research, Northeastern University is now requiring completion of the NIH Office of Extramural Research training for all human subject research, regardless of whether or not investigators have received funding to support their project.

The online course titled "Protecting Human Research Participants" can be accessed at the following url: http://phrp.nihtraining.com/users/login.php. ***This requirement will be effective as of November 15, 2008 for all new protocols.***

Principal Investigators, student researchers and key personnel (participants who contribute substantively to the scientific development or execution of a project) must include a copy of their certificate of completion for this web-based tutorial with the protocol submission.

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☐ Certificate(s) Attached

☐ Certificate(s) submitted previously – on file with the NU's Office of Human Subject Research Protection

A. Investigator Information

Principal Investigator (**PI cannot be a student**) David Lazer
Investigator is: NU Faculty_X__ NU Staff___ Other _____
College College of Computer & Information Science; College of Social Sciences & Humanities
Department Political Science
Address 132 Nightingale Hall, Boston, MA 02115
Telephone (617) 496-0102_____ Email d.lazer@neu.edu

Is this student research? YES___ NO_*X*__ If yes, please provide the following information:

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B. Protocol Information

Title Amendment to Online Laboratory for Behavioral Experimentation: Traveling Salesperson
Projected # subjects 100,000 (this protocol is for a web-based laboratory, and therefore while we can report the exact number of participants afterwards, it is difficult to project with any precision)

Approx. begin date of project 5/1/2013_____ Approx. end date ____5/1/2017_____

It is the policy of Northeastern University that no activity involving human subjects be undertaken until those activities have been reviewed and approved by the University's Institutional Review Board (IRB).

- Anticipated funding source for project (or none) ____Army Research Office, Army Research Laboratory _____
  Has/will this proposal been/be submitted through:
  - NU's Office of Research Administration and Finance (RAF) ___X___
  - Provost _____
  - Corp & Foundations _____

C.

Will Participants Be:	Yes	No	Does the Project Involve:	Yes	No
Children (<18)		X	Blood Removal?		X
Northeastern University Students?	X		Investigational drug/device?		X
Institutionalized persons?		X	Audiotapes/videotapes?		X
Prisoners?		X			
Cognitively Impaired Persons?		X			
Non or Limited English Speaking Persons?		X			
People Living outside the USA?	X				
Pregnant Women/Fetuses?		X			
Other? *(Please provide detail)*					

Please answer each of the following questions using non-technical language. Missing or incomplete answers will delay your review while we request the information.

D. What are the goals of this research? Please state your research question(s) and related hypotheses.

The objective of this project is to examine how the structure of a network affects the collective problem solving ability of a set of people. The question we are addressing is that if you give a number of people the identical complex problem to work on, how much communication is good for the collective performance of the group?

We use the Traveling Salesperson Problem as a context to evaluate collective problem solving on a problem that is both complex but also has a single, best solution. We measure performance as

the deviation from the single shortest path to every city on a map that is algorithmically pre-determined. Shorter deviations from the ideal shortest path correspond to better performance.

If exposed to other participants' solutions, we expect that users will "exploit" better solutions by imitating them to improve their own solutions. We also expect that exposing players to too much information on a regular basis will lead to "information overload" that will decrease overall performance. We also expect that exposing player to the cumulatively best solution to date rather than the most recent solution will result in less exploration of alternative solutions to the problem as well as lower overall performance.

E. Provide a brief summary of the purpose of the research in non-technical language.

In the traveling salesman problem the subject is presented with the scenario of a salesman who has to go to a number of identified cities, and the objective is to produce an itinerary that takes the salesman through every city and returns them to the origin that minimizes the total distance traveled. A solution is simply a sequence of cities traveled to that includes each city a single time. This research has participants solve these problems in several collaborative configurations. We expect that performance will be best when players have some information about other players' performance but that too much information will overload them and lead to worse performance.

F. Identify study personnel on this project. Include name, credentials, role, and organization affiliation.
David Lazer, Ph.D. Principal Investigator. Professor, Depts of Computer Science & Political Science, Northeastern University

Brooke Foucault Welles, Ph.D. Co-Investigator. Assistant Professor, Dept of Communication Studies, Northeastern University.

Jeff Hoye. Lead Engineer. External Consultant to Northeastern University

Ceyhun Karbeyaz. Co-Investigator. Graduate Student, Dept of Computer Science, Northeastern University

Brian Keegan, Ph.D. Project Manager. Post-Doctoral Research Fellow, Dept. of Political Science, Northeastern University.

Waleed Meleis, Ph. D. Co-Investigator. Professor, Dept of Computer Science, Northeastern University

Alan Mislove, Ph.D. Co-Investigator. Assistant Professor, Dept of Computer Science, Northeastern University

Skyler Place, Ph.D. Psychologist. External Consultant to Northeastern University

G. Identify other organizations or institutions that are involved. Attach current Institutional Review Board (IRB) approvals or letters of permission as necessary.

H. Recruitment Procedures

Describe the participants you intend to recruit. Provide all inclusion and exclusion criteria. Include age range, number of subjects, gender, ethnicity/race, socio-economic level, literacy level and health (as applicable) and reasons for exempting any groups. Describe how/when/by whom inclusion/exclusion criteria will be determined.

SEE MAIN PROTOCOL APPLICATION FOR DETEAILED INFO RE RECRUITMENT PROCEDURES

Describe the procedures that you will use to recruit these participants. Be specific. How will potential subjects be identified? Who will ask for participation? If you intend to recruit using letters, posters, fliers, ads, website, email etc., copies must be included as attachments for stamped approval. Include scripts for intended telephone recruitment.

SEE MAIN PROTOCOL APPLICATION FOR DETEAILED INFO RE RECRUITMENT PROCEDURES

What remuneration, if any, is offered?

Participants will not be paid for participation.

I. Consent Process

Describe the process of obtaining informed consent*. Be specific. How will the project and the participants' role be presented to potential participants? By whom? When? Where? Having the participant read and sign a consent statement is done only after the researcher provides a detailed oral explanation and answers all questions. Please attach a copy of informed consent statements that you intend to use, if applicable.

If your study population includes non-English speaking people, translations of consent information are necessary. Describe how information will be translated and by whom. You may wait until the consent is approved in English before having it translated.

SEE MAIN PROTOCOL APPLICATION FOR DETEAILED INFO RE CONSENT PROCESS

If your population includes children, prisoners, people with limited mental capacity, language barriers, problems with reading or understanding, or other issues that may make them vulnerable or limit their ability to understand and provide consent, describe special procedures that you will institute to obtain consent appropriately. If participants are potentially decisionally impaired, how will you determine competency?

N/A

If incomplete disclosure during the initial consent process is essential to carrying out the proposed research, please provide a detailed description of the debriefing process. Be specific. When will full disclosure of the research goals be presented to subjects (e.g., immediately after the subject has completed the research task(s) or held off until the completion of the study's data collection)? By whom? Please attach a copy of the written debriefing statement that will be given to subjects.

There is no deception on this website, for any of the experimental categories. Although explanations & instructions will be provided at the beginning of each experiment, the design of some experiments may require manipulating and hiding the condition to which participants are assigned. However, the researchers will make published papers, presentations, and other research results available on a section of the Volunteer Science website.

J. Study Procedures

Provide a detailed description of all activities the participant will be asked to do and what will be done to the participants. Include the location, number of sessions, time for each session, and total time period anticipated for each participant, including long term follow up.

These experiments take place within the Volunteer Science online laboratory that can be viewed at http://www.volunteerscience.com. Logging into Volunteer Science and authenticating through their Facebook account (described above), participants are presented with a screen listing the experiments available for their participation as seen in Figure 1.

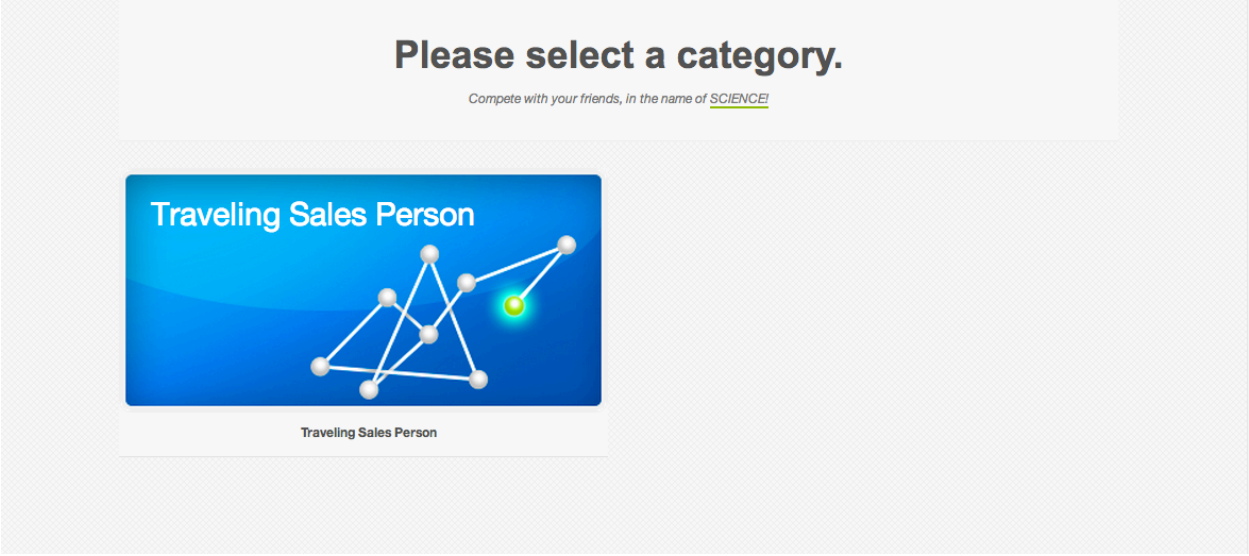

Figure 1: User Options for Participation

Selecting the "Traveling Salesperson Problem" tile on this screen, users will be taken to a second page that presents an approximately 90-second video illustrating the basic functionality of the game as well as the objectives for their participation as seen in Figure 1. If the user has not completed the tutorial before, he or she will have to complete a brief tutorial session

demonstrating the functionality. This tutorial session is "single player" and does not expose the user's information nor does the user interact with other users. Once the user has completed this tutorial, he or she can participate in the main experiments.

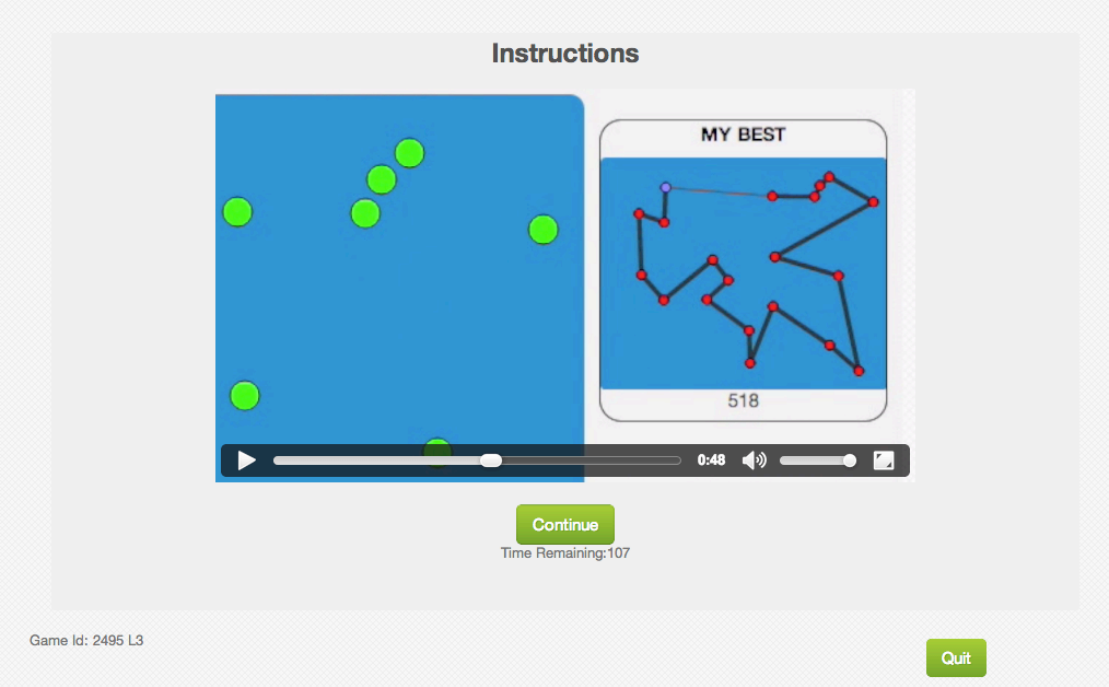

Figure 2: Screen capture of introductory video for Traveling Salesperson Problem.

These experiments have a two by three experimental design that manipulate the *frequency of information* in three conditions and the *salience of information* in two conditions. This feedback reveals only two pieces of information: the score of the player on the previous round and the solution proposed in the previous round. Feedback information is provided *to* and *from* other players simultaneously participating in the experiment. All players receive the same information if they share an assignment to a particular condition. An example of this feedback is provided in Figure 2. In all conditions, no identifying information about the other users are disclosed: users identify their own performance as "Me" and the other users are identified with generic "User 1" and "User 2" labels.

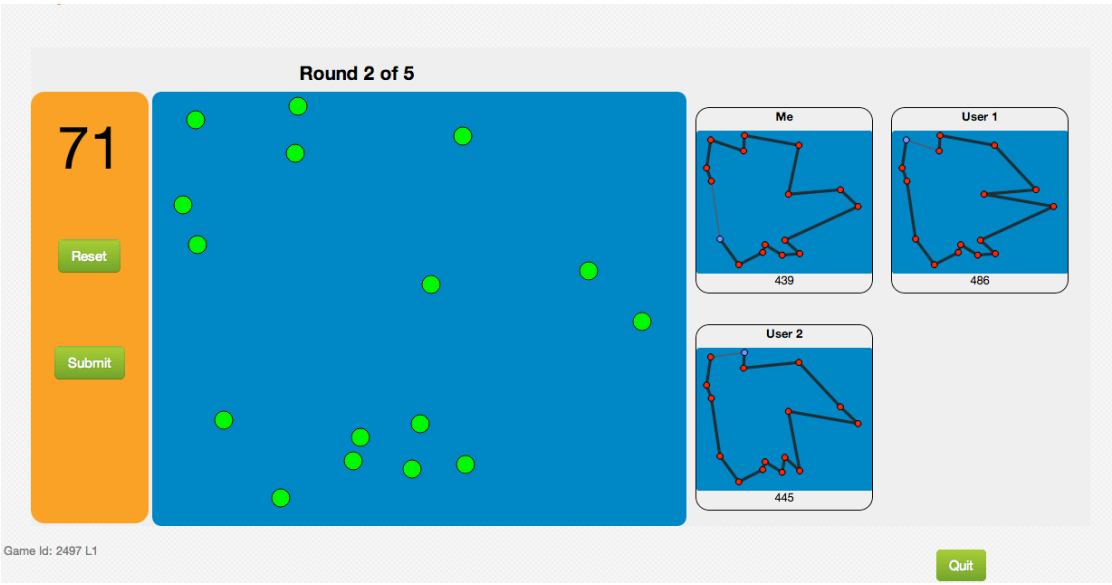

Figure 3: Example of feedback provided to player from other users.

The *frequency of information* manipulation has three conditions. The first condition is a control condition in which the player cannot see any other players' feedback. The second condition allows players to see other simultaneous players' feedback every *third* round. The third condition allows players to see other simultaneous players' feedback every *single* round.

The *salience of information* manipulation has two conditions. The first condition is a control condition in which the player only sees other players' *most recent* solution. The second condition is an experimental manipulation in which players see other players' *best solution* to date. In the first round of the experiment, there is no most recent information and so this feedback information cannot be provided to players since it does not exist.

Each session will take approximately 45 seconds and players will complete at least 5 but no more than 20 rounds. We estimate the total time for user participation will be no more than 20 minutes and will likely be under 10 minutes. We will adjust the number of rounds based upon experience. Users may be resorted into new groups after each session and do another round of the problem. Users will not be compensated.

Who will conduct the experimental procedures, questionnaires, etc? Where will this be done? *Attach copies of all questionnaires, interview questions, tests, survey instruments, links to online surveys, etc.*

All experiments will take place on the Volunteer Science website (http://www.volunteerscience.com). Details about the location of these servers and their data are described in the subsequent sections. The experiments will be conducted by Brian Keegan under the supervision of David Lazer. Copies of the consent form used on the website are available on both the website and are also attached.

K. Risks

Identify possible risks to the participant as a result of the research. Consider possible psychological harm, loss of confidentiality, financial, social, or legal damages as well as physical risks. What is the seriousness of these risks and what is the likelihood that they may occur?

SEE MAIN PROTOCOL APPLICATION FOR DETEAILED INFO RE RISKS

Describe in detail the safeguards that will be implemented to minimize risks. What follow-up procedures are in place if harm occurs? What special precautions will be instituted for vulnerable populations?

L. Confidentiality

Describe *in detail* the procedures that will be used to maintain anonymity or confidentiality during collection and entry of data. Who will have access to data? How will the data be used, now and in the future?

SEE MAIN PROTOCOL APPLICATION FOR DETEAILED INFO RE CONFIDENTIALITY

How and where will data be stored? When will data, including audiotapes and videotapes, be destroyed? If data is to be retained, explain why. Will identifiers or links to identification be destroyed? When? Signed consent documents must be retained for 3 years following the end of the study. Where and how will they be maintained?

M. If your research is HIPAA-protected, please complete the following; Individual Access to PHI

Describe the procedure that will be used for allowing individuals to access their PHI or, alternatively, advising them that they must wait until the end of the study to review their PHI.

N/A.

N. Benefits

What benefits can the participant reasonably expect from his/her involvement in the research? If none, state that. What are potential benefits to others?

SEE MAIN PROTOCOL APPLICATION FOR DETEAILED INFO RE BENEFITS

O. Attachments

Identify attachments that have been included and those that are not applicable (n/a).

	Copy of fliers, ads, posters, emails, web pages, letters for recruitment *
n/a	Scripts of intended telephone conversations*
	Copies of IRB approvals or letters of permission from other sites
XX	Informed Consent or Informed Consent and Health Information Use and Disclosure Authorization*

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_____ Debriefing Statement*
_____ Copies of all instruments, surveys, focus group or interview questions, tests, etc.
XX Signed Assurance of Principal Investigator Form ***(required)***
XX NIH Human Subject Training Certificate(s) ***(required if not already on file at HSRP)***

(Approved forms must be stamped by the IRB before use)

P. Health Care Provision During Study

Please check the applicable line:

__XX__ I have read the description of HIPAA "health care" within Section 3.0 of the Policies & Procedures for Human Research Protection. I am not a HIPAA-covered health care provider and no health care will be provided in connection with this study.

_____ I am a HIPAA-covered health care provider or I will provide health care in connection with this study as described in Section 3.0 of the Policies & Procedures for Human Research Protection. This health care is described above under "Study Procedures," and the Informed Consent and Health Information Use and Disclosure Authorization form will be used with all prospective study participants.

If you have any questions about whether you are a HIPAA-covered health care provider, please contact Nan C. Regina, Director, Human Subject Research Protection at n.regina@neu.edu or (617) 373-4588.

Please return the completed application to:

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The application and accompanying materials may be sent as email attachments or in hard copy. A signed Assurance of Principal Investigator Form may be sent via fax or in hard copy.