



**FORM: Application for Human Research**

NUMBER	FORM DATE	PAGE
F200	01/2013	1 of 10

- **Only electronic submissions will be accepted (see directions for electronic submission at the end of this form)**

**UACCESS EDOC NUMBER (FOR PROJECTS REQUIRING AN IRB FEE)** \_\_\_\_\_

**PROJECT TITLE:** Semantic Processing and Reading

**INVESTIGATOR**

Principal Investigator Name, Degree(s): Shiloh N. Drake, BA

Status/Rank: Ph.D. Student

Center: \_\_\_\_\_

Section: \_\_\_\_\_

Department: Linguistics

College: Social and Behavioral Sciences

Contact phone: 714-329-9211 Fax: \_\_\_\_\_

Official University Email: sndrake@email.arizona.edu

**ADVISOR CONTACT INFORMATION (REQUIRED FOR ALL STUDENTS AND RESIDENTS)**

Name, Degree(s): Kenneth I. Forster, Ph.D.

Contact phone: 520-621-2174 Fax: \_\_\_\_\_

Official University Email: kforster@u.arizona.edu

**ALTERNATE/COORDINATOR CONTACT INFORMATION**

Name: \_\_\_\_\_

Contact phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Official University Email: \_\_\_\_\_



**FORM: Application for Human Research**

NUMBER	FORM DATE	PAGE
F200	01/2013	2 of 10

**SECTION 1: REQUIRED SIGNATURES**

**1. PRINCIPAL INVESTIGATOR**

I will conduct my research according to the University of Arizona HSPP Investigator Manual.

Signature: \_\_\_\_\_ Date: 09/09/13 Print Name: SHILOH DRAKE

**2. SCIENTIFIC/SCHOLARLY REVIEW**

I have examined the proposal cited above, and find that the information contained therein is complete and that the scientific or scholarly validity of the project appears appropriate.

Signature: \_\_\_\_\_ Date: 10/14/13 Print Name: Natesha Warner  
 Official University Email: nwarner@email.arizona.edu Phone number: 626-5591

**3. DEPARTMENT/CENTER/SECTION REVIEW**

I have reviewed this application and determined that all departmental requirements are met and that the investigator has adequate resources to conduct the Human Research.

Signature: \_\_\_\_\_ Date: 10/14/13 Print Name: Ofelia Zepeda  
 Official University Email: ofelia@u.arizona.edu Phone number: 621-8294

**SECTION 1b: SIGNATURES REQUIRED IF APPLICABLE**

**4. ADVISOR (FOR ALL STUDENTS AND RESIDENTS ACTING AS THE PI)**

I will oversee the student researcher according to the University of Arizona HSPP Investigator Manual.

Signature: \_\_\_\_\_ Date: 9/9/13 Department: PSYCHOLOGY  
 Official University Email: kforster@u.arizona.edu Phone number: 621-2174



FORM: Application for Human Research

NUMBER	FORM DATE	PAGE
F200	01/2013	3 of 10

SECTION 2: GENERAL INFORMATION

- How many Human Research studies is the PI involved in as [key personnel](#)? 0
- How many active subjects are there in the PI's currently open Human Research study/ies? 0
- How many investigators are involved on the PI's currently open Human Research studies? 0
- How many research coordinators are involved on the PI's currently open Human Research studies? 0
- What is the expected length of this project? Up to 5 years
- Where will the original signed consent and PHI Authorization documents be stored (building name and room)? Psychology 417
- If the Human Research project is funded, identify all sponsoring entity/ies: None
- If funding support is from a federal agency (such as a training grant, infrastructure grant, salary support, project grant, etc.), list federal agency and grant number
- Total funding amount **OR** per subject amount: None
- The Principal Investigator hereby affirms that ALL individuals who meet the definition of "investigator" (<http://www.orcr.arizona.edu/coi/uapol/investigator#investigator>) for this project in the current "Policy on Investigator Conflict of Interest in Research" (<http://www.orcr.arizona.edu/coi/uapol/investigator>) have completed the mandatory Conflict of Interest training (<http://www.orcr.arizona.edu/coi/training>) and have submitted the required Disclosure of Significant Financial Interests (<http://www.orcr.arizona.edu/coi/forms>)  Yes
- Please also select the appropriate statement below:
  - All investigators have certified in their submitted Disclosure of Significant Financial Interests (<http://www.orcr.arizona.edu/coi/forms>) that they have no Significant Financial Interests to disclose
  - OR**
  - One or more investigators have Disclosed Significant Financial Interests and the principal Investigator has attached a copy of the final determination of the COI Program Office or the Institutional Review Committee
- Are either a or b below true?  Yes  No



**FORM: Application for Human Research**

NUMBER	FORM DATE	PAGE
F200	01/2013	4 of 10

- a. the local PI is the sponsor of the clinical trial (including NIH-funded clinical trials where the local PI is the funding recipient OR IND holder);
- OR**
- b. The PI has been designated by a sponsor, contractor, grantee, or awardee to register the clinical trial to [ClinicalTrials.gov](http://ClinicalTrials.gov), as the [Responsible Party](#) (responsible for conducting the trial, and has sufficient data rights).

**If Yes, [Public Law 110-85](#) (FDA Amendments Act) requires registration of clinical trials. Indicate which of the following is true:**

- [ClinicalTrials.gov](http://ClinicalTrials.gov) “NCT” number for this trial (define):
- Registration pending
- Clinical trial does not require registration (click above to see what studies qualify)



**FORM: Application for Human Research**

NUMBER	FORM DATE	PAGE
F200	01/2013	5 of 10

**SECTION 3. PROJECT NARRATIVE**

**1) Background**

Looking at current models of how we access words, we can split them into two groups. The first group says that when you see a word, the first step in reading it is to recognize the form of the word, perhaps by recognizing the letters and the order they are in. Then, once you have the form, you can look up the meaning of the word, as if the word form were a file name or the start of a dictionary entry. We can call models like this form-first models.

There's a second group of models that says we start looking up the meaning of the word before we know exactly what form we're looking for. Each letter we recognize cascades directly to the meaning look-up. We can call these cascaded models, because there is no hold-up to make sure we have the right form. These models make a counterintuitive prediction that because we're not sure what word we're looking for, we briefly access the meanings of all the words that are spelled similarly to the word we are actually looking at. This means that when you see the word 'door', you think very quickly of the word 'door', but you also think of the word 'deer', and the word 'doctor', and so on. Previous research has shown that this model seems to be accurate. This research seeks to investigate how different variables, such as the typicality of a word, influence this prediction.

**2) Lay Summary (approximately 400 words)**

The proposed project intends to test how a variety of semantic (or meaning-based) variables affect how the meaning of a word is retrieved to further test the predictions made by the two models above. For example, does presenting a highly typical example of a category (say, 'sparrow') make the subsequent words in the same category easier (i.e., faster) to retrieve? Based on pilot studies, this should be the case.

The proposed project will examine this issue using behavioral methods that are correlated with word recognition. For example, a subject might see a word briefly displayed on a computer screen followed by another word, and press a button to respond to the word by indicating whether the word belongs in a given category. The time it takes the subject to press the button could be a measure of how easily the word is retrieved.

**3) Setting of the Human Research**

Research will be conducted in Professor K. I. Forster's Psycholinguistics Lab, in Psychology 417. Participants will be briefed before and after participation here as well.

**4) Resources available to conduct the Human Research**

The laboratory in which this research will take place contains three PC computers to run the behavioral experimental software by which the stimuli will be presented to the participants and by which the participants will overtly respond. This equipment is dedicated to use by the Psycholinguistics Lab, and access will be limited only by other experiments run by the same lab.

The PI has experience designing and conducting masked priming experiments. The PI's advisor has extensive experience designing and conducting masked priming experiments. On the basis of this expertise, all other personnel will be trained to ensure safety, accuracy, and consistency in



**FORM: Application for Human Research**

NUMBER	FORM DATE	PAGE
F200	01/2013	6 of 10

measurement. This training will include use of the collection and presentation software and participant rights, as well as regular evaluation and review.

**5) Study Population**

Up to 200 participants will be recruited from the Psychology subject pool. Participants from this pool are undergraduate students at the University of Arizona enrolled in PSY 150A1, and receive partial course credit for participation.

This pool will naturally include members of the populations relevant to this study, namely both males and females of a variety of linguistic backgrounds. Men and women and members of all ethnicities will be equally encouraged to participate. The subjects are expected to be representative of the ethnic groups present in introductory Psychology courses. Participants may be monolingual or multilingual, so long as English is a language they can speak and read. Selection criteria will balance male and female participants.

No vulnerable individuals are targeted for participation in this study. All participants are to be adults of age 18 or older.

The risk associated with participation in this study is no greater than that in daily life.

**6) Recruitment Methods and Consenting Process**

Recruitment will take place via the SONA online system, a website maintained by the Department of Psychology. Students in PSY 150A1 courses participate in experiments for partial course credit. Alternatively, they have the option of writing a paper for equivalent course credit. Students interested in the study may self-select for inclusion.

The study procedures, risks and benefits described in the disclosure form (Appendix A) and the voluntary nature of the study will be verbally explained to participants by a researcher when they arrive at the laboratory, and the researcher will answer any questions from the participants. Participants in the experiment will then read the disclosure form in Appendix A, as the task is similar to what participants may do on their own computers every day. The disclosure form is approved for use by the PI's advisor. This will be accompanied by a verbal explanation or clarification by the PI or other qualified research personnel, if necessary. The participants may take as much time as they desire to review and/or discuss the consent form, but it is not expected that more than 20 minutes would be required.

Protection from undue influence to participate comes from two sources. Firstly, none of the participants will be enrolled in a class taught by any experimental personnel. Secondly, participants may complete another assignment rather than participate.

Minors and members of other vulnerable populations will not be recruited.

Following the experiment, participants will be debriefed by the PI or other qualified research personnel using the script in Appendix C. No part of the experiment's purpose or procedures will be withheld from participants at any time. The purposes of debriefing are, first, to inform participants about the theoretical implications of the possible results without influencing their behavior on the experimental tasks, and second, to learn any concerns or insights the participants may have had about the experimental procedure that may affect the interpretation of results, potentially including software



**FORM: Application for Human Research**

NUMBER	FORM DATE	PAGE
F200	01/2013	7 of 10

or hardware malfunctions during the experiment not known to experimenters. Participants will have the opportunity to ask and have answered questions about the experiment.

**7) Procedures involved in the Human Research**

All participant procedures will be carried out in Prof. Forster’s lab in the Psychology Building (room 417). Participants will be shown to a soundproofed booth with a computer and either a button box or a keyboard to record responses. During the experimental task, the participant will see series of letter sequences (such as words) presented on the computer monitor (see Appendix C for example stimuli). The participant will also be asked to respond to the sequences by pressing buttons. This portion of the study should take no more than 30 minutes.

After this is complete, the participants will be orally debriefed using the script in Appendix B.

**8) Risks to subjects**

The risk associated with participation in this study is no greater than that in daily life. Subjects will be reading words on a computer screen for no more than one hour, and pushing buttons similar to typing on a keyboard in response to those words. If subjects do experience any discomfort, they are freely allowed to cease participation in the study.

**9) Potential benefits to subjects and/or society**

There are no direct benefits to subjects in this experiment. The benefit to society is that we will gain a better understanding of how people read and process words.

**10) Provisions to protect the privacy of subjects and the confidentiality of data**

Participants will consent, participate, and be debriefed in the privacy of a laboratory setting; only research staff will have knowledge of participation. Because of the low-risk nature of this experiment, this is sufficient protection of privacy during participation.

Collected experimental data will be associated with a subject number carrying no link to personally identifying information. This data will be stored on a password-protected computer in Psychology 417. Access will be limited to research personnel. Because of the anonymity of the data collection, no signature will be collected in the consent process. For the purposes of granting course credit, participants’ names will be stored on the web-based experiment system maintained by the Psychology Department. No record of individuals who have participated in the proposed study will be visible to anyone except the personnel associated with this experiment on this website. The website’s record of which students have participated in which experiments is expunged at the end of each semester.

**11) Subject compensation**

Participants will receive partial course credit for participation. Protection from undue influence comes from two sources. Firstly, the participants will not be students of any experimental personnel. Secondly, participants may complete another assignment rather than participate.

**12) Withdrawal of subjects**



**FORM: Application for Human Research**

NUMBER	FORM DATE	PAGE
F200	01/2013	8 of 10

Participants may voluntarily withdraw at any time and for any reason. If they do so, they will still receive course credit for participation in this study. There is no risk, health or otherwise, posed by sudden withdrawal.

**13) Sharing of results with subjects**

Students will be advised that if they are interested in the outcome of the experiment, they should contact the PI at the end of the semester.

**SECTION 4: LIST OF ATTACHMENTS FOR THIS SUBMISSION**

Document Name	Version Date
A. Disclosure Form	1. 09/01/13
B. Debriefing Script	2. 09/01/13
C. Example Stimuli	3. 05/01/13
D. Verification of Human Subjects Training Form	4. 09/01/13
E. Shiloh Drake CV	5. 09/01/13
F. Dr. K. I. Forster CV	6. 09/01/13



## Submission List for F200: Application for Human Research

### **Required items for all F200 submissions:**

- F107: Verification of Training Form
- Current PI/Co-PI CVs or biosketch, if not included with copy of grant application
- Conflict of Interest Review documentation (if one or more “investigators” for this project as the term is defined in the current “Policy on Investigator Conflict of Interest in Research” (<http://www.orcr.arizona.edu/coi/uapol/investigator#investigator>) have disclosed Significant Financial Interest(s)).

### **Other Items as applicable:**

- **Biosafety Review letter** (for UA - Institutional Biosafety Committee)
- **Certificate of Confidentiality**
- **Compressed Gases Review letter** (for UA – Research Instrumentation)
- **Contract** – complete or draft copy of contract including budget
- **Data Collection Tools** – surveys, questionnaires, diaries not included in the protocol, data abstraction form for records review
- **Data monitoring Charter and Plan**
- **Drug/Device information** – Investigator’s Brochure, drug product sheet, device manual, user’s manual, instructions for use, package insert, IND/IDE documentation, FDA 1572 form, 510k indication, FDA exemption, sponsor determination of device risk, etc.
- **Export Control Review**
- **Grant Application(s)** – complete copy of grant, regardless of home institution or funding agency, and a copy of the Notice of Grant Award
- **Informed Consent/Permission/Assent Form(s)** – including study specific release of information documents, DHHS approved sample consent forms. If consent will not be documented in writing, a script of information to be provided orally to subjects
- Other Approval letters (e.g., school districts, Tribal, other IRB approvals)
- **Participant Materials** – All written materials to be provided to or meant to be seen or heard by subjects (e.g. study newsletter, physician to participant letter, wallet cards, incentive items, holiday/birthday cards, certificates, instructional videos/written guides, calendars, certification of achievement, etc.)
- **PHI Authorization Form(s)**
- **Protocol** – including all amendments/revisions, sub- or extension-studies
- **Radiation Safety Review letter**
- **Recruitment Materials** – telephone scripts, flyers, brochures, websites, email texts, radio/television spots, newspaper advertisements, press releases, etc.
- **Scientific Review Committee letter** (for cancer related projects – AZCC SRC; other units as applicable if the unit has a scientific review committee)
- **Site Authorizations** for research purposes and/or access to administrative records/samples
  - External sites (such as schools, other hospitals or campuses, etc.)
  - UAMC South Campus Site Authorization
  - UAMC University Campus Site Review Authority (SRA) letter
- **Supplemental site information** (for sites engaged in research where the UA is the IRB of record)
  - Copy of any approvals granted from that site (including determinations if this site has an IRB of its own)
  - Site-specific F107

- Copy of the site's human subjects training policy
- CV and medical license (if applicable) of site PI
- **Use of retrospective research samples and/or data** – IRB approval letter, original consent under which samples/data were collected, letter allowing access to samples

### **Submitting documents to the IRB**

The required method of submission is electronic. Maintain electronic copies of all information submitted to the HSPP office in case revisions are required. Guidelines have been established and must be followed to make the electronic submission and triaging work smoothly.

1. Documents must be submitted to the [VPR-IRB@email.arizona.edu](mailto:VPR-IRB@email.arizona.edu) account and not to individual staff email accounts. After contact by a staff member future correspondence may be communicated directly to the staff member.
2. **If acknowledgement of receipt is needed, please request a “Read Receipt” through your email server.** If you use Microsoft Outlook 2007, this is accomplished by clicking “Options” and choosing the “Request a Read Receipt” checkbox in a new email.
3. One submission request per email (e.g. one continuing review plus attachments).
4. All submissions must have signatures. An email acknowledgement in place of a signature will not be acceptable.
5. Word documents are preferable for items that may be modified or revised by the IRB (e.g. consents, applications, and protocols). PDFs may be submitted for documents that typically are not revised by the IRB (e.g. Investigator Brochures).
6. Email subject line must include: PI Last Name, Department, IRB # (if assigned one), and type of submission (Modification, New Project, etc.).
7. The email must provide a list of the documents submitted for review. While the documents attached do not have to adhere to a specific naming scheme, it is requested that each document be named to clearly reflect what is inside.
8. Submissions not following these guidelines will be returned without review.

## APPENDIX A

### DISCLOSURE FORM

1  
2  
3 Title of Project: **Semantic Processing and Reading**  
4

5 You are being invited to voluntarily participate in the above-titled research study. The purpose of  
6 the study is to understand how words are represented and stored in the mental lexicon. You are  
7 eligible to participate because you are a skilled reader in English, a student enrolled at the  
8 University of Arizona, and you are over 18 years of age.  
9

10 If you agree to participate, your participation will involve making decisions to letter sequences  
11 (such as whether they make real words, or they are names of familiar objects, or whether you  
12 have seen them before). You will indicate your response by pressing one of two response keys as  
13 quickly and as accurately as possible. The experiment will take place at Psychology #417, and  
14 will last approximately 30 minutes.  
15

16 Any questions you have will be answered and you may withdraw from the study at any time.  
17 There are no known risks from your participation and no direct benefit from your participation is  
18 expected. There is no cost to you except for your time and you will not be compensated for your  
19 participation. However, if you registered through the Psychology SONA system, you will get 1  
20 experiment credit for participation, which will be automatically credited to your account.  
21

22 Only the principal investigator and research personnel will have access to your name and the  
23 information that you provide. In order to maintain your confidentiality, your name will not be  
24 revealed in any reports that result from this project. You may decide to not begin or to stop the  
25 study at any time. Your refusing to participate or your decision to discontinue your participation  
26 will have no effect on your student status. Also any new information discovered about the  
27 research will be provided to you. This information could affect your willingness to continue your  
28 participation.  
29

30 You can call the Principal Investigator or the Principle Investigator's advisor to tell about a  
31 concern or complaint about this research study. The Principle Investigator is Shiloh Drake, a  
32 Ph.D. student in Linguistics, who can be called at (714) 329-9211. The Principal Investigator's  
33 advisor is Kenneth Forster, Professor of Psychology, who can be called at (520) 621-2174. If you  
34 have questions about your rights as a research subject you may call the University of Arizona  
35 Human Subjects Protection Program office at (520) 626-6721. If you have questions, complaints,  
36 or concerns about the research and cannot reach the Principal Investigator; or want to talk to  
37 someone other than the Investigator, you may call the University of Arizona Human Subjects  
38 Protection Program office. If you would like to contact the Human Subjects Protection Program  
39 via the web (this can be anonymous), please visit <http://www.irb.arizona.edu/contact/>.  
40

41 By participating in this study, you are giving permission for the investigator to use your  
42 information for research purposes.  
43

44 Thank you.  
45 Shiloh Drake

## APPENDIX B

The script below is an example of what would be said during the debriefing. Because of the natural variation in conversation, the actual utterances may vary. However, the key ideas expressed in this example will be present in every variation on the script.

### **SAMPLE SCRIPT FOR DEBRIEFING SUBJECTS AFTER THE EXPERIMENT**

Looking at current models of how we access words, we can split them into two groups. The first group says that when you see a word, the first step in reading it is to recognize the form of the word, perhaps by recognizing the letters and the order they are in. Then, once you have the form, you can look up the meaning of the word, as if the word form were a file name or the start of a dictionary entry. We can call models like this form-first models.

There's a second group of models that says we start looking up the meaning of the word before we know exactly what form we're looking for. Each letter we recognize cascades directly to the meaning look-up. We can call these cascaded models, because there is no hold-up to make sure we have the right form. These models make a counterintuitive prediction that because we're not sure what word we're looking for, we briefly access the meanings of all the words that are spelled similarly to the word we are actually looking at. This means that when you see the word 'door', you think very quickly of the word 'door', but you also think of the word 'deer', and the word 'doctor', and so on.

A recent series of experiments tested this prediction by using masked priming. In visual masked priming, a word called a prime is very briefly displayed before the word you are responding to. This prime word is displayed briefly enough that most people aren't aware that they've seen anything at all, but long enough that it can affect how you read the word you respond to, the target word. In these recent experiments, none of the primes were words in the 'yes' category, but some were spelled similarly to words in the 'yes' category, like how 'door' would be similar to 'deer' if the category were ANIMAL.

People were faster to respond if the word that the prime word was spelled similarly to was in the same category as the target word (like 'door-TIGER') than if it was in a different category (like 'book-TIGER'). This means that the counterintuitive prediction of the cascaded models is correct, because 'door' can start activating the meaning of the word 'deer' in the very brief period that the prime word is shown.

The purpose of this experiment was to find out whether the semantics, or meaning, of a prime affected the response to the target, and if so, how the response was affected. By looking at this, we can see whether the meaning of a word has a role in retrieving other words.

## APPENDIX C: EXAMPLE EXPERIMENTAL ITEMS

The following is a list of items indicative of the type of letter sequences that will be displayed for subjects' response. It is not intended to be exhaustive.

PARROT	trampoline	southward
SPARROW	ordain	perk
PIGEON	cables	ideal
SEAGULL	hormone	erupt
DOVE	honk	notion
PARAKEET	blubber	golf
FALCON	claw	inn
CANARY	humankind	slower
OWL	cinch	memory
OSTRICH	desk	museum
PENGUIN	widower	writer
RAVEN	mimicking	acorn
TUBA	IRELAND	omen
CELLO	ARGENTINA	heroin
BASS GUITAR	BRAZIL	cargo
OBOE	IRAQ	helix
BASS	AUSTRALIA	geranium
VIOLA	AFGHANISTAN	neck
HARP	INDIA	leap
HORN	SWEDEN	flooring
TROMBONE	RUSSIA	coin
VIOLA	SWITZERLAND	grumpy
roman	CHILE	strain
blurry	GREAT BRITAIN	tally
crucial	JAPAN	command
future	COPPER	agree
check	CHLORINE	ritual
blocked	NEON	bran
flame	CALCIUM	KETCHUP
tempest	ALUMINUM	BUTTER
cleanest	BORON	BASIL
semaphore	LITHIUM	VANILLA
vision	ZINC	MUSTARD
bingo	SODIUM	HOT SAUCE
polio	POTASSIUM	VINEGAR
function	SULFUR	HERBS
seaboard	ZINC	HOT SAUCE
deem	inland	PUNK
gear	canal	BLUES
flake	range	REGGAE
patio	metro	OLDIES

