



FORM: Application for Human Research

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- **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: Absolute pitch: The Burmese language, tonal second language acquisition, and the Advantage of musical training

INVESTIGATOR

Principal Investigator Name, Degree(s): Marissa Cooper

Status/Rank: Undergraduate/Honors Thesis

Center: _____

Section: _____

Department: Linguistics

College: Social and Behavioral Sciences

Contact phone: 602-881-1753 Fax: _____

Official University Email: mmc3@email.arizona.edu

ADVISOR CONTACT INFORMATION (REQUIRED FOR ALL STUDENTS AND RESIDENTS)

Name, Degree(s): Amy Fountain, Ph.D.

Contact phone: 626-1498 Fax: 626-9014

Official University Email: avf@email.arizona.edu

ALTERNATE/COORDINATOR CONTACT INFORMATION

Name: _____

Contact phone: _____ Fax: _____

Official University Email: _____



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SECTION 1b: SIGNATURES REQUIRED IF APPLICABLE

THIS PAGE MAY BE DELETED IF NOT 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.
Linguistics

Signature	Date	Department
avf@email.arizona.edu	626-1498	
Official University Email	Phone number	

5. RESPONSIBLE PHYSICIAN (PROJECTS INVOLVING MEDICAL PROCEDURES WHICH THE PI IS NOT AUTHORIZED TO CONDUCT)

I am a physician licensed by the State of Arizona (or US license for the SAVAHCS). I will be responsible for ensuring that all procedures that are part of this project and that require the attendance of a licensed physician will have a suitable physician present during the procedures. If at any time this is not possible, I will inform the IRB before any procedures are conducted.

Signature	Date	Print Name
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6. NATIVE AMERICAN OR INTERNATIONAL INDIGENOUS POPULATIONS REVIEW

Signature needed only if research takes place in Indian Country or among international Indigenous populations, actively recruits Native Americans or international Indigenous populations for enrollment, and/or requires stratification of Native Americans or international Indigenous populations as one of the statistical analyses or study aims.

- Social and Behavioral Projects: American Indian Studies, (520)621-7108**
- Biomedical Procedures: Office of Outreach and Multicultural Affairs, (602)827-2327**

I have examined the proposal cited above and advise that further appropriate tribal/Indigenous approval []is []is not necessary.

Signature	Date	Print Name
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SECTION 2: GENERAL INFORMATION

1. How many Human Research studies is the PI involved in as key personnel? 0
2. How many active subjects are there in the PI's currently open Human Research study/ies? 0
3. How many investigators are involved on the PI's currently open Human Research studies? 0
4. How many research coordinators are involved on the PI's currently open Human Research studies? 0
5. What is the expected length of this project? 1 year
6. Where will the original signed consent and PHI Authorization documents be stored (building name and room)? No consent form. Oral consent script available in Douglas 218A.
7. If the Human Research project is funded, identify all sponsoring entity/ies): Honors College (possible – not yet sought)
8. 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
9. Total funding amount **OR** per subject amount: _____
10. 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 Yes
11. Please also select the appropriate statement below:
 - X 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
12. Are either a or b below true? Yes No



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- 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, 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 "NCT" number for this trial (define):
- Registration pending
- Clinical trial does not require registration (click above to see what studies qualify)



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SECTION 3. PROJECT NARRATIVE

1) Background

‘Absolute Pitch’ is the ability to name or produce a note of particular pitch (for example ‘middle C’), in the absence of a reference note (Deutsch, D. 2002). The capacity for absolute pitch is rare and few people have been documented possessing absolute pitch. One of the few individuals known to have possessed this capacity was Wolfgang Amadeus Mozart. By contrast, many musicians have no difficulty naming notes if they are first given a reference note, a phenomenon called ‘Relative Pitch’. Therefore, relative pitch appears to be an acquired ability that can be learned by training in music, while absolute pitch may or may not have a learned component.

Many researchers conducted studies concerning the phenomenon of absolute pitch. Levitin (1994) demonstrated that absolute pitch has two main components—long term pitch memory and the ability to label pitch. Pitch memory is the ability to recall knowledge of pitch consistently and over a long period of time and Pitch labeling is the ability to apply the same identity to these pitches. Levitin’s opinion is in order to possess true Absolute Pitch one must possess both of these abilities (Levitin 1994). Takeuchi & Hulse (1993) developed programs in the hope to train people to acquire absolute pitch. They found that these programs were not successful. Because pitch is a key part of differentiating words in tone languages, research began focusing on the parallel between acquisition of tone languages, and probability of developing absolute or relative pitch. Deutsch, D. & Henthorn, T. (2004) conducted two experiments concerning two tone languages—Mandarin and Vietnamese. Of the participants involved in these studies, only one had any musical training. Most did not. The results for both experiments showed that there was no difference in the degree of pitch consistency when the subjects read the word list on different days, showing a natural ability of absolute pitch. These studies suggest that acquisition of a tone language may be even more powerful than early musical training in the development of absolute pitch; they also suggest that the mechanisms needed for the acquisition of tones in language are the same as, or at least highly related to, those put to use in musical training and development.

Not all tonal languages possess the same number and quality of tones. The question remains then, regardless of the type of tone language, can the language encourage absolute pitch in its speakers as well? Burmese is spoken by approximately thirty million people in Burma (Myanmar) and it is a member of the Tibeto-Burman language family. The tones in the language are different from the previous tested languages—possessing a high, low, creaky and glottalized tone. This language was chosen because it is an obscure tonal language. This characteristic will benefit later in the experiment because there is a learning aspect and there will be less likelihood of a learning bias.

The experiment will consist of two parts: testing the occurrence of absolute pitch in Burmese speakers and testing the learning of Burmese with various groups. The first part of the experiment will test whether native Burmese speakers have absolute pitch. They will be given a set of words that span the range of all four tones in Burmese, for example, “nine” in Burmese is a high tone and ‘hard’ in Burmese is a low tone, etc. These words will be in a randomized order over the days to eliminate an ordering effect. The participants will repeat words twice and have two sessions over two days for a total of four recording of each word. I will use PRAAT in order to find the fundamental frequencies for each word and find the difference in the average of the two fundamental frequencies: day 1 first word repeat vs. day 1 second word repeat, day 2 first word repeat vs. day 2 second word repeat, Day 1 first word repeat and day 1



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second repeat word average vs. Day 2 first word repeat and day 2 second repeat word average. The second part of the experiment will test whether trained singers or musicians in general have a better aptitude for learning tonal languages compared to someone not trained. Three groups of participants will be tested: trained vocally, trained musicians no vocal training, no musical or vocal training. In the first phase, the participants will be asked to come in for two sessions and sing a song for each session. The fundamental frequency will be taken and assessed for the two days. In the second phase, each participant will listen to words with different tones in Burmese and be asked if they hear a difference in tones, writing their response down. In the third phase, the participant will be introduced to four words that only differ in tone. They will then hear a list of tonal minimal pairs to test their perception of tones. The participants will be given a cheat sheet of tones they were introduced to and they will write which tone they think they hear. There will also be a survey to gather information about the participant that could be pertinent to the research project.

2) Lay Summary (approximately 400 words)

Absolute pitch is the ability to name or produce a certain pitch. Tonal language speakers such as Mandarin and Vietnamese speakers have shown a greater likelihood of having absolute pitch. The experiment will consist of two parts: testing the occurrence of absolute pitch in Burmese speakers and testing the learning of Burmese within various groups. The first part of the experiment will test whether native Burmese speakers have absolute pitch. They will be given a set of words that span the range of tones in Burmese. These words will be in a randomized order over the days to eliminate an ordering effect. The participants will repeat words twice and have two sessions over two days for a total of four recordings of each word. The second part of experiment will test whether trained singers or musicians in general have a better aptitude for learning tonal languages compared to someone not trained. Three groups of participants will be tested: trained vocally, trained musicians no vocal training, no musical or vocal training. In the first phase, the participants will be asked to come in for two sessions and sing a song for each session. The frequency of the first sound will be taken and assessed for the two days. In the second phase, each participant will listen to words with different tones in Burmese and be asked if they hear a difference between two tones, writing their response down. In the third phase, the participant will be introduced to four words that only differ in tone. They will then hear a list of words that differ only in tone to test their perception of tones. The participants will be given a cheat sheet of tones they were introduced to and they will write which tone they think they hear. There will also be a survey to gather information about the participant that could be pertinent to the research project.

3) Setting of the Human Research

I will conduct my research in Phoenix, Arizona and at the University of Arizona. I will use the recording booth and recording equipment in the Douglass building when at the University of Arizona and my personal computer while at the subjects' homes in Phoenix.

4) Resources available to conduct the Human Research

The PI will conduct the research, with supervision from the faculty advisor. The PI will recruit a small number (fewer than 15) of speakers of Burmese from her home, where she maintains ongoing



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personal relationships (friendships, ESL tutoring) with them for the first phase of the study. The Burmese speakers will participate only on a voluntary basis. The PI and faculty advisor will then recruit undergraduate students (fewer than 50) enrolled in linguistics courses at the UA, via an existing departmental system for awarding a small amount of extra credit in courses for experiment participation. During this phase, the PI and faculty advisor will coordinate with other faculty and graduate students in the linguistics department to ensure that our use of the undergraduate subjects, and our utilization of departmental resources (Recording booth, recording equipment), is in keeping with the Department’s policies on conducting research.

5) Study Population

Phase I: Speakers of Burmese (no more than fifteen)

Subjects will be recruited from a population of Burmese refugees with whom the PI has become friends through outreach and recreational sports. The PI will safeguard possible participants from undue coercion or influence by:

- inquiring about strictly voluntary participation (no remuneration will be offered)
- assuring potential participants that their participation is not in any way required of them

Phase 2: Volunteers from University of Arizona and local Tucson community (no more than fifty)

The experiment will test whether trained singers or musicians in general have a better aptitude for learning tonal languages compared to someone not trained. Three groups of participants will be tested: those trained vocally, trained musicians with no vocal training, and those with no musical or vocal training.

The experiment is entirely non-medical, so if any female subjects happen to be pregnant, they are not a vulnerable population for the purposes of the study. Also, the only participants in the study will be eighteen years or older.

Because native speakers of Burmese are typically Burmese, the ethnic make-up of the subject population for Phase I will reflect that fact. The ethnic make-up of participants for Phase II will represent the ethnicities of students taking introductory Linguistics courses.

6) Recruitment Methods and Consenting Process

Subjects will be identified through the PI’s personal friends and through U of A students as well as volunteers from the local community. Recruitment will begin in the summer for the first experiment and in the fall for the second experiment. The PI’s personal friends and volunteers from the local community will be recruited on a volunteer basis and the students in the linguistics program will be recruited using extra credit. The consent script will be read orally to all participants, and the signature acknowledging consent of each participant will be obtained and kept for documentation with the rest of the PI’s data.

For Phase I (Burmese speakers), the PI will make Burmese speakers she knows through soccer and tutoring aware of the project through word of mouth. She will explain informally to them about the



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experiment and let them know that they could participate in it if they would like to, and that they could also let their friends and family who speak Burmese know about it.

For Phase II (UA students and volunteers from local community), announcements about the experiment will be posted on the course websites of introductory Linguistics courses in which the instructors offer extra credit for experiment participation. Announcements will only be posted with instructor permission. Students can then sign up to participate in the experiment through the Linguistics Department's online experiment sign-up system. The PI may also recruit additional UA students as subjects through word of mouth among friends.

7) Procedures involved in the Human Research

Phase 1:

Native speakers of Burmese will be recorded as they speak selected words in that language. Words will be selected based on their grammatical properties (in particular, their ‘tone’, or grammatical pitch). These words will be in a randomized order over the days to eliminate an ordering effect. The participants will repeat words twice and have two sessions over two days for a total of four recordings of each word. The recordings will then be analyzed, and pitch data will be extracted for analysis. A short questionnaire will be included to assure that Burmese is the first language for each refugee. None of this information will be sensitive or risky in any way.

Phase 2:

Non-Burmese speakers will participate in two sessions, one session on each of two different days. On the first day, participants will sit in a sound booth and be audio-recorded while singing a song. Next, they will listen using headphones to words with different tones in Burmese and be asked if they hear a difference between two tones; writing yes or no on piece of paper or pressing a button on a response box or computer keyboard to indicate their answer. They will then hear a list of tonal minimal pairs to test their perception of tones. The participants will be given a cheat sheet of tones they were introduced to and they will write which tone they think they hear. On the second day, the participant will again sit in a sound booth and be audio-recorded while singing the same song from the previous day. There will also be a survey to gather information about the participants that could be pertinent to the research project, such as what languages they speak, at what age they began what type of musical training, etc. None of this information will be sensitive or risky in any way.

8) Risks to subjects

No risk greater than that encountered in daily life. The materials are all non-sensitive materials. The Burmese speakers will be speaking words in Burmese such as “nine”, etc.

9) Potential benefits to subjects and/or society

The study will have no direct benefit to the subjects. The benefit to science will be gathering more knowledge about second language learning and the absolute pitch phenomenon in tonal languages.

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



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The names of the subject will only be kept for reporting participation for extra credit. It is possible that someone may hear the recordings and recognized a subject’s voice. However, since the materials to be recorded are all of non-sensitive content, even if someone heard the recordings and recognized a subject’s voice, this would pose no danger to the subject. The data files will be stored in the PI’s personal computer and backed up on an external hard drive where no one else has access. Data will not be destroyed, as it poses no risk to subjects because of the non-sensitive nature of the content, and if such data were needed again in the future, more subjects would have to be inconvenienced in order to obtain new data if this data were destroyed.

12) Cost to subjects

The only costs to subjects will be their time, and any cost for transportation to where they do the experiment. However, UA subjects are expected to be at the university anyway when they do the experiment, and Burmese subjects experiment will be conducted at their homes so there will typically be no transportation costs. Each session will last no more than one (1) hour.

13) Subject compensation

Phase 2 participants will receive compensation in the form of a small amount of extra credit in linguistics courses. Also, the phase 1 and 2 participants will receive a cookie out of gratitude.

17) Sharing of results with subjects

I will compose a one-page write up of my findings and distribute it to the Burmese participants. I will also offer to send it to UA student participants if requested.

SECTION 4: LIST OF ATTACHMENTS FOR THIS SUBMISSION

Document Name	Version Date
1. Form T509 – Long Form Consent Form	1. 1/1/2013
2. PI – Biosketch (Cooper)	2. 4/20/2013
3. CV – Advisor (Fountain)	3. 4/15/2013
4. Recruitment announcement for Phase 2	4. 4/19/2013

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 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.

