COVER SHEET FOR PROPOSALS TO THE NATIONAL SCIENCE FOUNDATION

FOR CONSIDERATION BY NSF ORGANIZATIONAL UNIT (Indicate the most specific unit known, i.e. program, division, etc.)	PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE
Memory and Cognitive Processes	

SUBMITTING INSTITUTION CODE (If known)	FOR RENEWAL ☐ CONTINUING AWARD ☐ ACCOMPLISHMENT BASED RENEWAL ☐ REQUEST, LIST PREVIOUS AWARD NO.:	IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? Yes____ No X ; IF YES, LIST ACRONYM(S)

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Sponsored Projects Office, Encina Hall, Rm 40

ADDRESS OF ORGANIZATION (INCLUDE ZIP CODE)

Stanford University, Stanford, CA 94305-6060

IS SUBMITTING ORGANIZATION: ☐ For-Profit Organization; ☐ Small Business; ☐ Minority Business; ☐ Woman-Owned Business

TITLE OF PROPOSED PROJECT

The Acquisition of Musical Percepts with a new Scale

REQUESTED AMOUNT	PROPOSED DURATION	DESIRED STARTING DATE
$286,604	3 years	April 1, 1988

CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW:

- ☐ Animal Welfare
- ☐ Endangered Species
- ☒ Human Subjects
- ☐ Marine Mammal Protection
- ☐ Pollution Control
- ☐ National Environmental Policy Act
- ☐ Research Involving Recombinant DNA Molecules
- ☐ Historical Sites
- ☐ Interdisciplinary
- ☐ International Cooperative Activity
- ☐ Research Opportunity Award
- ☐ Facilitation Award for Handicapped
- ☐ Proprietary and Privileged Information

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PI/PD NAME/TITLE	SOCIAL SECURITY NO.*	HIGHEST DEGREE & YEAR	SIGNATURE
Max V. Mathews, Professor (Research)		ScD 1954	Max V. Mathews
ADDITIONAL PI/PD (TYPED) John R. Pierce, V. Prof. Em.		PhD 1936	John R. Pierce
ADDITIONAL PI/PD (TYPED)			
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*Submission of social security numbers is voluntary and will not affect the organization's eligibility for an award. However, they are an integral part of the NSF information system and assist in processing the proposal. SSN solicited under NSF Act of 1950, as amended.

The Acquisition of Musical Percepts with a New Scale

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Abstract

New musical scales, the 3:5:7:9 Bohlen-Pierce scales, have recently been invented. We propose to use these scales as a vehicle 1) to study long-term learning of high-level musical concepts and 2) as an example of the creation of a new musical language with a rich and partly specifiable harmonic structure. The Bohlen-Pierce scales have already been shown to have perceptible low-level sensory properties such as consonant and dissonant chords and chords with high intonational sensitivity (subjects can hear whether or not they are in tune). They also have a rich structure of keys which is comparable in complexity to those of the diatonic scale, but completely different in detail. We believe these scales are unique stimuli with which to study learning of higher-level concepts because subjects exist who have no previous exposure to the scales.

We plan to give subjects extensive ear training until they can reliably transcribe music played in the new scales. Then we will test the subjects on concepts such as probe-tone profiles for the different tones in a key, similarity judgements for the 13 different keys which exist in these scales, similarities of chords (including a chord and its inversions), and sensitivities to cadences and other chord progressions.

One group of subjects will have ear training also designed to teach a specified set of concepts. A comparison group will be taught with random sequences of Bohlen-Pierce pitches. We predict that these two groups will have very different concepts.