Informed Consent to Participate in Research

Principal Investigator: Yoshi Ohno

Study Title: Visual recognition of lighted character signs in aviation

Study Site(s): NIST Gaithersburg, Bldg. 220, Room C02E

Key Information

This is a brief summary of key information to describe the research study you are being invited to participate in. You will find more detailed information explained later in this document.

- ***Voluntary Consent:*** *You may be eligible to participate in this research study. Taking part in this study is completely voluntary. You may decide to participate or not participate.*
- ***Purpose:*** *We are doing this research to increase air traffic safety at airports. The experiment will be conducted to determine the requirement for brightness levels of the airport runway signs for incoming aircraft approaching the airport for landing.*
- ***Duration:*** *This experiment for each participant will take approximately one hour.*
- ***List of Procedures and Activities:*** *You will be asked to sit in our dark room lab and view a lighted sign shaped character "X" presented at the other end of the lab. You will be asked whether you can read "X" or not when we change its light levels at various conditions.*
- ***Risks or Discomforts; Reasonable, expected benefits****: This research is considered to be minimal risk. You will be in a dark environment for one hour and may feel some discomfort though we will take breaks between sessions. Benefit is that you will contribute to safety of air traffic.*

Introduction

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an informed consent form. Please read this information carefully and take your time making your decision. Ask the researcher or study staff to discuss this consent form with you, please ask him/her to explain any words or information you do not clearly understand. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are provided.

The person who is in charge of this research study is Dr. Yoshi Ohno**.** This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge.

This research is being sponsored by Federal Aviation Administration.

Purpose of the study

The purpose of this study is to investigate the visual recognition of lighted character signs used at airports seen from pilots of incoming aircraft, and to determine the maximum allowed luminous intensity level of the sign. At airports, lighted "X" sign is placed at runways to inform the pilots

of incoming aircrafts that this runway is closed for landing. The light sources for these signs were changed from incandescent lamps to light-emitting diodes (LEDs) recently, and it is reported that the signs appear too bright and X sign is not recognized in some cases. This study will conduct vision experiments with subjects using a scale model of the lighted X sign to determine the maximum allowed brightness of the sign. The results of this study will contribute to improved specifications for such lighted signs at airports, thus contributing to increased safety of air traffic.

Why are you being asked to take part?

You are being asked to participate in this research because we need data of human visual perception. There are individual variations in visual response, and we need to obtain meaningful average results from data of a number of subjects for the parameter we investigate. If you are an employee or associate of NIST, you should have a permission from your supervisor for your participation.

Study Procedures:

If you take part in this study, you will be asked to:

- We will first do a visual acuity test for you viewing a test chart with letters of different sizes. If you are not a pilot, if the result is a higher number than 20/20 (with glasses if you use them), we will cancel experiment with you. If you are a pilot, we will proceed to experiment with you regardless of the test results. The results will be used only for data analysis purpose.
- We will also do a color deficiency test for you (you will read colored dots), but you will not be disqualified by this result. This is used only for data analysis purpose.
- You will be asked to complete a demographic questionnaire, for your gender, age, and race/ethnicity. Your demographic information is kept confidential. Your demographic data will be connected to your experimental data using an assigned participant number, and the number will never be linked to your name or to this form you will sign. If you choose not to provide your demographic information, we will withdraw you from participating in the experiments without any penalty.
- The experiment will take a total of approximately one hour.
- We will have short breaks between sessions, but you are welcome to request taking breaks at any time if necessary.
- The experiments will take place at our lab located at the basement of Bldg. 220, Room C02E. This is a long-distance (30 m) dark room lab.
- There will be no recording of audio or video during experiment.
- During experiment, a small lighted character “X” is presented at various brightness at the other end of the dark room. As you will look at the light, the investigator will ask you whether you recognize the character X (or it may look like a dot or a box), and you answer verbally yes or no. The investigator will record your answer on a spreadsheet on a laboratory computer and present next light. This will be repeated for a number of presentations of the lighted X character at several different conditions.
- The data on the computer will not include your name, all data including your responses and visual acuity test results are anonymous and only connected to the assigned participant number.

- After the experiment, you are welcome to ask any additional general questions about signaling and airport lighting. The investigator will be happy to answer any general questions on lighting.

Total Number of Participants

We expect a total of 50 subjects or less will participate in this study over a period of one or two years.

Alternatives / Voluntary Participation / Withdrawal

You do not have to participate in this research study.

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study.

If at any time you choose to withdraw before the experiment starts or during experiment or after the experiment, you only have to inform it to the investigator. If you withdraw during or after the experiment, collected data from you will be deleted. If your participation is ended by the investigator without your consent for any reason, you will be informed so.

Benefits

You will receive no benefit(s) by participating in this research study.

Risks or Discomfort

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study. There might be some discomfort, as you will be in a dark room for one hour, but it may be similar condition as when you look at stars at night for some time. There is also a very small risk that someone who is not authorized could get access to the data we have stored about you. However, we describe how we will protect your privacy and confidentiality in a later section of this consent form.

Compensation

You will receive no payment or other compensation for taking part in this study.

The findings from this research may result in the future development of products that are of commercial value. There are no plans to provide you with financial compensation or for you to share in any profits if this should occur.

Costs

It will not cost you anything to take part in the study.

Privacy and Confidentiality

We will keep your study records private and confidential. Your name will not be linked to any of the demographic information, visual acuity test results, or the experimental results. Even the investigators will not be able to identify which data and results belong to which participant. The demographic data and visual acuity test results will be linked with the experimental results using an assigned participant number. Your name will not be linked to this number. All records of email communications with you for scheduling purposes will be kept confidential and will not be disclosed to anyone to the extent permitted by law. No emails will be linked to your assigned participant number, experimental data, or demographic information.

Certain people may need to see the study records, which includes the consent form, demographic information and experimental data. Anyone who looks at your records must keep them confidential. These individuals include:

- The research team, including the Principal Investigator, study coordinator, and all other research staff.
- Certain government people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right way.
- Any agency of the federal, state, or local government that regulates this research.
- The sponsors of this study, Federal Aviation Administration.

Your identity will be protected to the extent permitted by law, including the Freedom of Information Act. We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are. Total confidentiality cannot be guaranteed, since all security measures have vulnerabilities and may be compromised.

Future use of research data and/or specimens

The data collected in this study will be analyzed and the results will be reported to the sponsor of this study or be published in scientific journal. The raw data will be stored in the primary investigator's computer for conducting analysis and kept for future studies, and will be accessed only by him. Note, also that the raw data stored are not connected to your name. The raw data will never be publicly posted.

You can get the answers to your questions, concerns, or complaints

If you have any questions, concerns or complaints about this study, or experience an unanticipated problem, or research-related injury call Yoshi Ohno at NIST extension 2321 or 301-975-2321.

If you have questions about your rights as a participant in this study, or have complaints, concerns or issues you want to discuss with someone outside the research team, call the Human

Subjects Protection Office at (301) 975-5445.

You will receive a copy of this signed consent form.

Consent to Take Part in this Research Study

I freely give my consent to take part in this study. I understand that by signing this form I am agreeing to take part in research. I have received a copy of this form to take with me.

Below is for NIST employees only.

I am a NIST employee and understand I am responsible for assuring I have approval to participate in this research as a part of my official duties; I am at least 18 years of age; and have spoken to one of the study researchers, who answered any questions I had about this study.

_____ _____
Signature of Person Taking Part in Study Date

_____
Printed Name of Person Taking Part in Study

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research subject has provided legally effective informed consent.

_____ _____
Signature of Person obtaining Informed Consent Date

_____
Printed Name of Person Obtaining Informed Consent