Can You Point Me In The Right Direction?

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COGS155: Spring 2015
Inspiration

  - “Humans frequently accompany direction-giving with gestures.”
    - 28 undergrads explain directions to specific buildings on campus.
    - Analyzed utterances, gesture, hand morphology
Research Questions

When giving someone directions around a university campus does gesturing help improve the accuracy of route direction comprehension and execution? Additionally, does the frame of reference used by the person giving directions influence the accuracy of the listener?
Our Research Paradigm

- Six experimental scenarios
  - Gesture present: Ego, Allo, Geocentric.
  - No Gesture: Ego, Allo, Geocentric
- All participants in each condition will hear same directions and see same gesture strokes.
- Between subject design.
Pre-Screening for Participants

- Ads will be posted on various locations around San Diego (SDSU, USD, PLNU) as well as online and in the newspaper.
- During online registration, participants will answer a questionnaire.
- Participants will be chosen based on their responses.
- No physical disabilities.
University of California, San Diego
Pre-study Questionnaire
Principal Investigators: Omar Masanweh, Alan To, Shelley(Wei-Hsuan) Y., Jeffrey Lima Saucedo

Name_________________________ Date_____________ Age______

Handedness: Right / Left / Ambidextrous Right dom./ Ambidextrous Left dom./ Ambidextrous Please circle one

1. Please select one of the following ethnicities you identify with and elaborate:
   Example: if Japanese, select "Asian" then write in "Japanese"
   — White
   — Asian
   — Hispanic
   — Native American
   — African American
   — Other

2. Where (What country) did you spend the majority of your life?

3. What is your native language? Is it your dominant language?

4. What language(s) do you speak at home?

5. Please list the highest level of education you have completed?

6. If employed, what is your current occupation?

7. Do you have any physical disabilities, if so please list.

8. What is your mode of transportation to get to the experiment?
Experiment Overview

- Non-UCSD participants will be asked to park at Gilman Parking Structure.
- On their arrival, they will be escorted to Pepper Canyon.
- They will be given a package and asked to deliver it to either the Cog Sci Building or Shiley’s Eye Center where they will “actually be doing their experiment.”
Experiment Overview

- Each participant will be given a set of directions written in respect to egocentric, allocentric, and geocentric
- Gesture / No gesture
- Our independent variable will consist of an accuracy score which will take into account amount of time it took to reach destination and if they asked for help. (Via smartphone, students, or called for help.)
~ 0.5 miles = 11 min walk according to UCSD campus maps.
1.5 miles = ~ 5-7 min driving according to UCSD campus maps.
Direction Narratives

Scenario 1
Allocentric:
1. As you walk out of the building head towards the main road, Gilman Dr.
2. Once you get to Gilman Dr. continue walking past the bus stops and head towards the library once you get to the second street light.
3. Continue walking down library walk until you get to the fake tree in front of the library.
4. Once you get to the fake tree, head up the hill towards the cog sci building and enter room 104.

Scenario 2
Geocentric:
1. As you are leaving the parking structure head East onto Gilman dr. and continue following that road.
2. Begin to head East onto Voigt dr.
3. follow that road then turn South onto Campus Point dr.
4. Continue following that road South and turn East into Parking lot P755.
Allocentric:
1. As you walk out of the building head towards the main road, Gilman Dr.

2. Once you get to Gilman Dr. continue walking past the bus stops and head towards the library at the second street light.

3. Continue walking down library walk until you get to the fake tree in front of the library.

4. Once you get to the fake tree head up the hill towards the cog sci building and enter room 104.
Behind the Scene

- The package contains a fine point tracking device.
- Time starts as soon as they step out of the building or leave Gilman parking structure.
- Time stops as soon as the package arrives at the destination.
Second-by-Second Passive Tracking Device

- Cheap ($200)
- Relatively small
  - Uses 2 AA batteries
  - The size of 2 normal USB thumb drives.
- Collects data on speed, direction, time, and location.
Data will be collected as so

Trip #1
Departed on 1/5/2015 6:17:29 PM
from [1780 Duncan Pl, Woodstock, IL]
Drivetime: 1hr 9min
Mileage: 32.017 Miles
Arrived on 1/5/2015 7:27:11 PM
at [784 Briarwood Ln, Roselle, IL]
Stopped for 1sec

Trip #2
Departed on 1/5/2015 7:27:12 PM
from [788 Briarwood Ln, Roselle, IL]
Drivetime: 20min 38sec
Mileage: 0.114 Miles
Arrived on 1/5/2015 7:47:50 PM
at [783 Briarwood Ln, Roselle, IL]
Stopped for 22min 55sec

Trip #3
Departed on 1/5/2015 8:10:45 PM
from [789 Briarwood Ln, Roselle, IL]
Drivetime: 15min 49sec
Mileage: 0.204 Miles
Arrived on 1/5/2015 8:26:34 PM
at [785 Briarwood Ln, Roselle, IL]
Stopped for 3hr 3min
Post-Questionnaire

- Participants will fill out a questionnaire when they get to their designated location.
- Questionnaire will help researchers separate participants into different categories and determine if their data will be kept/discarded depending if they got the last question correct.
University of California, San Diego
Post-study Questionnaire

Principle Investigators: Omar Masarweh, Alan To, Shelley (Wei-Hsuan) Yi, Jeffrey Lima Saucedo

Name______________________________ Date____________________

1) On a scale of 1-10 (10 being most familiar) how familiar are you with UCSD’s campus?

2) Did you encounter any problems heading to your location? Explain

3) What was the you find most difficult in following our directions?

4) Did you use a smartphone to find the location?

5) Did you utilize the campus map?

6) Did you ask for help? If so, how many people did you ask?

7) Did you make any pit-stops? If so, how many?

8) Did the person giving you directions gesture with his or her hands?

9) Please describe any traffic or obstacles that you may have encountered on your drive here. (please use back side of paper if needed)
**Analysis**

- Questionnaire information will be processed with the GPS data.
- Pausing, taking alternate route, or delays will be weighed and contribute to lower accuracy scores.
- Cross reference with culture and background for any interactions.
- Data will be recorded and analyzed through ANOVA software.
- Video recording with Microsoft Kinect of experimenter gesturing and possibly use blind coders to analyze for similarity between subjects using parameters established by Núñez, R., Cooperrider, K., Doan, D, Wassmann, J. (2012) - coding for directionality, stroki-ness, and displacement.
Considerations

- Taking into account time spent at traffic lights or stop signs.
  - Driving simulator?
- How they got to campus may influence knowledge of campus routes.
- What to do with people who receive help.
Potential Applications

- Create GPS software that processes users information and outputs the best directions based on their background, possibly utilizing gesture
- Triton Humanoid that gives directions on campus
- Hologram GPS?

Funding needed for

- Incentive for participants (~$20-25 or SONA credit for SDSU students)
- Parking for each participant.
- Tracking device ($120)
- Blind Coder's (Training and analysis)
- Microsoft Kinect 2 and gesture analysis software. (~$200)
Bibliography


