ARE YOU COMFORTABLE DOING THAT?: ACCEPTANCE STUDIES OF AROUND-DEVICE GESTURES IN AND FOR PUBLIC SETTINGS

Written by David Ahlström, Khalid Hasan, Pourang Irani
Presented by Lauren Buck

OVERVIEW

- Around-device (AD) gestures have been found advantageous by several research groups.
- Gestures, however, are not integrated due to perceptions regarding social acceptance.
- Based on the findings of three studies conducted in this paper, proper recommendations for AD designers are made.
  - Gesture size, duration, and in-air position are all considered.

INTRODUCTION: WHY?

- AD interactions on very small devices facilitate input.
- Expand input vocabulary of mobile phones.
- Minimize screen occlusion.
- More efficient in search and retrieval tasks in analytic settings.
- Little is known about users’ comfort using AD interactions.
- Gestures attract undesired attention or intrude on others’ personal space.
- Interactions in particular settings cause embarrassment or discomfort.

INTRODUCTION: FOCUS

- Gestures and AD interactions belong to an acceptability continuum.
  - Social comfort of users when performing AD gestures in public settings.
  - Locations and in front of whom users feel comfortable.

- Studies include:
  - Distance from device
  - Position relative to device
  - Size
  - Duration
  - Elicited opinions from public observation
INTRODUCTION: CONCLUSIONS

I. Identifies how specific AD gesture features influence user comfort and acceptance.

II. AD gestures are perceived equally by users with introversion or extroversion traits.

III. Propose recommendations to assist AD-interaction designers.

RELATED WORK

- Jones et al. examined user performance and preferences for multi-scale navigation in AD space.
- Runkainen et al. introduced the study of social acceptance of gesture input on mobile devices.
- Rico and Brewster studied how social settings influenced the acceptance of device-based gestures.

Acceptance and comfort level have received very little in-depth attention. People are very concerned about how others react. People are sensitive and selective about using gestures in certain settings.

STUDY I: REGION AND DISTANCE

- Comfort level variation in regions around and distances from device.
- If perceptions about AD gestures are related to extroversion.

Participants asked to perform gestures in a mall entrance zone:
- Based on a natural viewing distance.
- Set of 45 images guided the participant, which included a position in the air and a one digit number to draw at the indicated position.
Out of eighteen participants, four indicated that their impressions during the task were more negative than positive.

No participant rejected the idea of using AD gestures.

One indicated he would only feel comfortable at home and alone.

Sixteen indicated comfort in at least one non-private setting.

One indicated he would feel comfortable in all public settings.

Big-5 indicated that 9 of the 18 participants had an extraversion percentile score below 50, and nine above.

There were no significant differences between those with introverted versus those with extroverted personalities.

Both personality types open to the idea of AD gestures.

In addition, it was indicated that gestures made further from the device were rated the worst as far as comfort level.

Participants stated they felt either uncomfortable or very uncomfortable doing gestures far away from the device.

Participants stated they felt either comfortable or very comfortable when gesturing at a close distance from the device.

Comfort pertaining to size and duration of gestures.

Similar tasks to Study I

Set of images prompted users to draw one-digit numbers in the air at a specific in-air position around the device.

Label in upper left corner indicated how long the user was required to draw the prompted number.

Small and large gestures were used.

Three gesture durations: 3, 6, and 9 seconds.
STUDY II: SIZE AND DURATION

- Smaller gestures felt more comfortable, as they attracted less attention.
- It was noted that larger gestures could be comfortable if they were done in a favorable location and were quick.

- In private settings, size and duration had little or no effect.
- With familiar audiences, size and duration were more important.
- With less familiar audiences in non-private locations pronounced differences in comfort level were seen.

STUDY III: SPECTATORS

- Examines the reactions of persons who have watched someone else performing AD-gestures.
- Used to compare the effect of having participants perform interactions themselves to the effect of only letting participants observe and imagine their own future usage of AD-gestures.
- Author performed AD-gestures in different settings.
- Same image set used in Study I.
STUDY III: SPECTATORS

“Most spectators did not think much about what the user was doing or felt that it looked “cool.”

“Few found that gesturing was weird behavior or that it looked strange.

“Similarly to Study I, users indicated that they would feel comfortable using AD-gestures when alone or in front of a partner or friends.

“However, higher acceptance rates for most locations were found.

DESIGN CONSIDERATIONS AND RECOMMENDATIONS

- AD-gestures belong to an acceptability-continuum.

- Users are sensitive to distance, input region, gesture size and duration.
  - Distance: AD-gestures closer to the device are more acceptable.
  - Input Region: Strong preference is given for inputs to the right and left of a device (for left and right handed users respectively), and in front of a device.
  - Size: Users indicated a strong preference for small gestures.
  - Duration: Acceptance drops rapidly after gestures last more than 6 seconds.
  - Gesture Property Interplays: AD-interaction designers can achieve socially acceptable designs even when their interactions require less favorable property characteristics.

IMPROVED ACCEPTANCE STUDY METHODS

- It is recommended that studies tease apart specific gesture features when feasible.

- Ask participants to rate their views after actually experiencing use in a public setting.

- Exploration of social acceptability regarding personality traits.