Research Portfolio

Gillian “Gus” Andrews, EdD

*gus.andrews@gmail.com*

www.gandre.ws
How I got into user research

• Interest in human cultural activity
  – Ethnographies as an undergrad
• Teaching in the South Bronx
• Grad school for educational media/tech
  – If technologies are supposed to teach themselves...
• Linden Lab
• Blog and dissertation
MCGRAW HILL (2005)
Setup

• Goal: improve CD ROM to accompany educational psychology textbook
• Use case: faculty teaching future teachers
• Constraints
  – Cut and dried: execute plan with set budget and report back
  – 8 participants (small dataset)
  – Studying both content and interface
Execution

• Design
  – Semi-structured interviews
  – Screen-sharing observation of use (no recording)

• Findings
  – Concerns over where content loaded from (campus wifi limitations)
  – Video interface problems
Research question

• With all the interest in using games to teach, which games are reaching which kids?
  – By race/class (socioeconomic status)
  – Interests of kids in low-income schools hadn’t been covered
Setup

• Access to two high schools
• Constraints:
  – Time schools would offer me to meet with kids within school hours
  – Just me, no money for tools
  – No responses to request to observe in homes
    • Self-report data (but even that can reveal participants dissembling...)
Methods

• Survey
  – Chi squares
• Pile sorts
• Small-group or one-on-one interviews with representatives of population
Findings

• Low-income school students
  – Likely to report not playing computer games and preferring console games
    • In interviews: preferred controls
    • Survey: less likely to play online with friends
    • Interaction with access
    • Key: games research was focused on MMORPGs
  – 80% had played a sports game in past year
Findings

- Girls
  - Casual games
  - Survey: active attempt to hide gaming; self-contradiction
Girls and isolation

- Significantly less likely to report playing outside the home

<table>
<thead>
<tr>
<th>Location</th>
<th>% girls</th>
<th>% boys</th>
<th>Pearson chi-square</th>
<th>Degrees freedom</th>
<th>Signif</th>
<th>Pearson's R, interval</th>
<th>Std. error</th>
<th>Signif</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friend's house</td>
<td>37.8%</td>
<td>58.6%</td>
<td>9.254</td>
<td>1</td>
<td>.002</td>
<td>.208</td>
<td>.06</td>
<td>.002</td>
</tr>
<tr>
<td>Relative's house</td>
<td>23.5%</td>
<td>40.5%</td>
<td>7.014</td>
<td>1</td>
<td>.008</td>
<td>.181</td>
<td>.06</td>
<td>.008</td>
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<tr>
<td>Game store</td>
<td>2.0%</td>
<td>17.2%</td>
<td>13.307</td>
<td>1</td>
<td>.000</td>
<td>.249</td>
<td>.04</td>
<td>.000</td>
</tr>
<tr>
<td>Net café (LAN)</td>
<td>1.0%</td>
<td>8.6%</td>
<td>6.293</td>
<td>1</td>
<td>.012</td>
<td>.171</td>
<td>.04</td>
<td>.012</td>
</tr>
</tbody>
</table>

- Interviews: don’t know what other girls do
Girls and isolation

- Significantly less likely to report play with peers

<table>
<thead>
<tr>
<th></th>
<th>% girls</th>
<th>% boys</th>
<th>Pearson chi-square</th>
<th>Degrees freedom</th>
<th>Signif</th>
<th>Pearson’s R, interval</th>
<th>Std. error</th>
<th>Signif</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 friend in person</td>
<td>36.7%</td>
<td>57.9%</td>
<td>9.452</td>
<td>1</td>
<td>.002</td>
<td>.211</td>
<td>.067</td>
<td>.002</td>
</tr>
<tr>
<td>1 friend online</td>
<td>4.1%</td>
<td>24.6%</td>
<td>17.246</td>
<td>1</td>
<td>.000</td>
<td>.285</td>
<td>.053</td>
<td>.000</td>
</tr>
<tr>
<td>Many friends in person</td>
<td>28.6%</td>
<td>57.9%</td>
<td>18.360</td>
<td>1</td>
<td>.000</td>
<td>.294</td>
<td>.065</td>
<td>.000</td>
</tr>
<tr>
<td>Many friends online</td>
<td>4.1%</td>
<td>26.3%</td>
<td>19.347</td>
<td>1</td>
<td>.000</td>
<td>.302</td>
<td>.052</td>
<td>.000</td>
</tr>
<tr>
<td>Strangers in person</td>
<td>1.0%</td>
<td>6.1%</td>
<td>3.804</td>
<td>1</td>
<td>.051</td>
<td>.134</td>
<td>.052</td>
<td>.051</td>
</tr>
<tr>
<td>(arcade, LAN)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strangers online</td>
<td>3.1%</td>
<td>26.3%</td>
<td>21.683</td>
<td>1</td>
<td>.000</td>
<td>.320</td>
<td>.050</td>
<td>.000</td>
</tr>
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</table>
I loved the way 3D space made room for experimenting with new research methods. Here I made an in-world Likert-scale device that users could click on to register their satisfaction with their experience. My boss nixed the idea, as we had richer data to work with, but I thought I’d throw this in as an example of some of the ways I thought about approaching this.
Setup

• Goals
  – Improve new user retention
  – Decrease interface frustration

• Use case
  – Primarily new users

• Constraints
  – Summer contract
  – Budget and time for 6 user observations
    • Had to set up observation lab
  – Dependent on busy data team
  – But: virtually unlimited ability to build in-world
  – Ability to redirect new users to test locations
Orientations would be a key focus for me, as it was part of new users’ first exposure to the software. (Though of course navigating the website’s new user registration process and installing the virtual world software were also quite important, particularly considering that many people tried to install the software on systems which couldn’t run the software or ran it poorly. I did identify some problems in user registration while doing observations, and made Jira tickets for them. These factors were outside the scope of my work, but still strongly impacted new user retention numbers on my experiments.)

Looking at statistics about successful new user orientations, one Japanese location stuck out for its success in producing new users who stayed on and participated in the currency system. My boss asked me to test whether this orientation could be adapted for English-speaking audiences.
Here, I’m adjusting the layout of the Japanese orientation somewhat. I suspected that a major strength of the orientation was that users were on a set track – they couldn’t wander off and get lost or stuck. There were one or two places on the original Japanese orientation where users got stuck, though: specifically, where they had to fly to get to the next location. We found this out by looking at maps of where new users logged out for the last time in an orientation and never returned. So these stairs helped ensure users could continue on through orientation even if they hadn’t yet learned to fly (which isn’t necessary for getting around). As you can see, there was a pretty low barrier to entry for iterating changes to content – I’d learned the building and scripting tools in Second Life, and it was pretty easy for me to test new things as a result.

Render times were a tremendous issue in Second Life at the time, primarily because of vast amounts of user-created content. I spent a lot of time talking to a coder who shared my concern about the impact on user experience. He’d worked on other 3D games elsewhere. He explained to me that particular elements were costly to render – transparencies, long vistas, water, and anything that had to load a whole lot of objects or graphic skins at once. The challenge here was that the Japanese orientation had a lot of transparencies – see the pale red and blue windows above. I didn’t want to change too much, so mine would be comparable to the Japanese island, but where I could I added in opaque walls (particularly where users first rezzed, so their very first moments would load quickly) and changed the terrain to keep the views bounded. I would have loved to have tested how this impacted render times and user experience, but sadly, I only had so much time.
The internationalization team let us know that Japanese audiences were more accustomed to reading instructions, and worried that non-Japanese audiences would be less patient with reading written directions in orientation. But, to test what it was about the Japanese orientation that was working, it was decided that we should keep the elements as close to the original as possible.

In user tests, some new users (particularly women) did take the time to read text and try to understand what was going on in-world. The exception was an experienced male gamer, whose strategy for learning Second Life reflected his experience: he tried to interact with things in-world by clicking or colliding with them. Ideally, I would have liked to have done more user tests and grouped users by different markets of interest to Second Life, and perhaps even to have observed users who had different goals and use styles going through different orientations (of which many were available from third-party developers).

In the end the reading question did not seem to matter, as this experimental orientation performed about as well as the original Japanese model and the non-experimental, Second-Life-developed orientation at the time. The latter involved a lot of interactive objects, a heads-up display, and some streaming audio – all of which were pretty easy for new users to break accidentally. I would have liked to have done more fine-tuned A/B testing with specific orientation elements.

Generally, though, from watching user observations, a UX designer and I came up with a rule of thumb: Users in a virtual world expect to interact with objects in the world, and expecting them to interact with text presents a lot of opportunities for confusion. Our recommendation was to gradually work to eliminate interactions in world which required use of text. At the time, these included not only signs like these ones but also much of the item purchasing process, which involved a complicated hybrid of clicking labeled box objects, receiving "notecards" which appeared as text, "unpacking" boxes into other objects, and negotiating with the user’s inventory menu. I’m told this process was streamlined, in part following some of the recommendations I made.
Here's an interesting problem I had to solve to ensure we got data on my orientation.

The first-time login process balances how many users get sent to which orientation islands. It prefers to send new users to locations where there are already other users, but not too many. Hence, they’ll be more likely to have a social experience, but also won't end up overloading a particular island. If there's no users on an island, it's unlikely anyone will get sent there; and to date, nobody had been on my islands.

To make it more likely that people would be sent to my adapted orientation, then, I spawned a number of drone accounts. This was weird in and of itself. Linden Lab is very particular that everyone you see in Second Life should be a "real person," so they discourage creating unmanned and multiple accounts. I was told this would only be OK if I could hide the avatars somewhere where users couldn't find them. So... I basically entombed them. Here they are, being prepped -- still "living" -- for the mausoleum. (I'm wondering if I should put "fiendish plot involving robots" on my resumé?)
And here is the finished product, with only the drones’ names showing they’re inside. It was unlikely that new users would make it up this high.
Initial Results

• New orientation performed about as well as old SL developed one
  – Did not seem improve retention (but it didn’t hurt either)
  – Meanwhile, Japanese group tweaked their original island and its performance suffered
• So: what else affected retention?
User testing aimed to shed more light on what new users were going through. I tested six users, who were tasked with starting from orientation and told to find a pair of shoes they’d like their avatar to wear.

In making videos out of user tests, I tried to isolate specific interface elements and tell the story of how they were or weren’t working for users. This kept things shorter and more focused than just showing developers a full user test. (Although, having done more work on web video by now, these videos now seem far too long to me. I’ve edited this one down. I’ve also obscured users’ faces and user names here to protect their privacy; within the company, developers got to see users’ smiles of delight, looks of confusion, and some indication of where they were looking on screen.)

This video focused on one of Second Life’s main dialog box systems – blue popup windows which appeared in the upper right of the screen with both system messages and messages related to user content. A number of their buttons, indicators, and behaviors proved confusing to users; the feedback they delivered was unclear and persistent in a way which made for unhelpful feedback at the wrong times. It wasn’t clear which messages were urgent and which were not.

I ended many of these videos with links to Jira tickets where developers could make specific changes. The videos were well-received; a number of developers expressed concern and went to work on some of the thornier issues. This was no small feat at a company where, at the time, developers largely defined their own scope of work.

My understanding is that an interface overhaul has since reformed this system, making use of my recommendations to clarify, move, and eliminate confusing behaviors from these popups. That happened after my contract was up, unfortunately, so I don’t know about outcomes. Other issues I highlighted had to do with the avatar customization system and the item purchasing system.
Since orientation was clearly not the only thing impacting whether users stayed on after their first login, I requested data on where new users went next. In analyzing the most-visited regions, I found that some of the locations we were encouraging users to teleport to (the blurred simulator names in red, above) were not actually performing well on key metrics, while others we did not necessarily recommend were much “stickier” and saw many more return visitors. Additionally, sites which ranked highly in our “Popular locations” search were also performing poorly. I worked to make visualizations, including the one above, of the more successful regions for encouraging return visits.

Again, because my contract there was short, I didn’t get a chance to revise orientation or do A/B testing or further drilling-down with this stuff, though I would have liked to.
DISSE ss  TATION (200 8-2010)
Research question: What is happening here?

(blogger)...Here’s a recording
http://insignificantthoughts.com/2006/06/13/cancelling-aol/[, [... ] of a guy trying to cancel his AOL account. Now THAT is funny....

(commenter 1) i wnt my aol account cancelled completely
[...] cancel mmy account, not just a new screen name...

(commenter 2)... by the way people, this is not where you
go to cancel any kind of account. Please try elsewhere
This is the abstracted pattern that I eventually decided to study. So this is a conversation pattern, hung on the error in step three. The error is identified by participants, not by the researchers. That’s how we know this is about local sensemaking. (More about this as part of our methods in a moment.)
The iterations of step 2 and 3 can be multiple and in many orders. Had to include something with a different “footing” on the topic from the original post, and had to include correction. I’ll be referring to the people who didn’t take the blogger’s approach to the topic “strangers,” and the people who did take the blogger’s approach (including the blogger) “natives.”
Some info on the dataset
Here’s a visualization of the threads; some spanned a lot of time, and others saw only a brief amount of activity. They’re color coded by general topic.
Setup

• Constraints
  – Increasing student debt.... Lol (not so lulzy actually)
    • Completed in two years
    • Continued in postdoc
  – Just me
    • Limited tech tools, tech skills for large linguistic corpus
  – Just comment threads
    • No observation, no server logs, no sense of queries
    • Surprising amount of content anyway (geographic location, etc.)

• Methods and tools
  – Grounded theoretical analysis (B. Glaser and A. Strauss, 1999)
  – Software: Atlas TI
  – ...
As I said earlier, I only looked at instances where the participants identified that there was something wrong. Fortunately, the Internet has many popular conventions for identifying and calling out when someone’s activity is out of line: it may be called “flaming,” “trolling,” “spamming,” or more recently, we see the “you’re doing it wrong” meme.

This focus follows the work of Harold Garfinkel, who identified how social order was constructed in real time, rather than based on some sense of abstract structure to which participants adhere. (These abstractions are what social science generally seeks, so this method sets Garfinkel apart from much of social science.) Garfinkel was interested in “breaches” of order as evidence of what the order was and how it was made.

One of Garfinkel’s “experiments” was observing how, in the absence of an immortal “line” structure at the bank, participants would arrive and create the line by calling each other out when they “breached,” aka were “doing it wrong.”
I also made use of conversation analysis, which similarly looks at how participants keep conversations orderly.

To do this, they repair misunderstandings by asking for clarification, sometimes interrupting people so that conversation doesn’t continue under incorrect assumptions.

Mediated communication like asynchronous conversations on the Internet (forum conversations or blog comments for example) makes such interruptions and requests for clarification hard.
Both methods have been applied to HCI, most notably by Lucy Suchman. Suchman looked at “expert systems” in Xerox copiers. These were systems designed to help people get through complicated print jobs and troubleshoot errors. What she found was that a major source of frustration was that humans and copiers had a different sense of what was going on -- a different sense of context. This is going to be important in a minute, because I'd like to demonstrate that search engines, like copiers, have a different sense of context from users. As we know, it’s based on the content that’s online – so where Suchman’s machines understood context based on simple sensors, search engines are understanding context based on huge amounts of mostly-written stuff and connections, which is a lot richer. But at its best it’s still only an approximation of an individual human’s context, and that’s why these searchers ended up on weird pages, bothering bloggers who also had a different sense of context.
A good example for looking at this context mismatch is this post from this blog. Blogger talks about ketchup Commenter gives a link to M&Ms site which quickly becomes the only reference to that URL online at the time
This comment eventually appears on the Ketchup of the People thread.

(READ)

(exigesis) So part of her context (at least as far as we know) was her paper and her desire to get a deal on custom M&Ms. When the search engine takes a turn at conversation and says “Here, here’s a page about custom M&Ms,” she tries to match her context with what she finds: a headline about ketchup and a “blog.” One way of interpreting this is that she has to order ketchup before she orders M&Ms. Another way is that this is a scam. (The way many of us would interpret this is that the page is just wrong for the search. Imagine, for a moment though, that you’re not willing to question that a search engine is this miracle machine that brilliantly finds all kinds of things on the Internet for you. How do you make sense then?)

So it’s NOT that she’s not reading at all – she sees that it’s a blog, she sees that ketchup is involved. She’s trying really hard, and coming to conclusions which might actually help (there’s times when an unexpected search result *will* be a scam, so it’s good she’s aware of that). She just maybe doesn’t have all the pieces.
Indexical differences

Natives
- “he, Maury”
- “he canceled his AOL”
- “this website is about LISP” (programming language)
- “I could buy customized M&Ms”
- “I need help with spiders”

Strangers
- “you, Maury”
- “please cancel my AOL”
- “on this website I can cure my lisp” (speech impediment)
- “where can I buy customized M&Ms?”
- “Help me with spiders”
Response patterns

• Coded for
  – Response to previous turn
  – First- or third-person forms of address; certainty
    • Magenta: “The person who can cancel an AOL account IS definitely here”
    • Green: “The person who can cancel an account is definitely NOT here”

• GraphViz
So as I said a second ago, it’s not necessarily the case that these commenters aren’t reading at all. They are trying to make sense, they just don’t have all the right pieces. What are the important pieces? Obviously, one important sense readers should have is what the site they’re on is about.

Natives and strangers spoke about the pages where they landed in very different ways. Here’s some analysis using the ManyEyes tool from IBM of what they were most often saying about the word “page.” The biggest difference was that strangers didn’t actually talk about the pages they were on at all. They’re talking about another page they’re concerned with.

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By contrast, these disagreements about the context of the page they were on yielded a higher number of uses of “page,” “site,” or “website” from natives – out of a lower number of comments overall from natives, 693 in total. Natives were specifically talking about what was going on on “this page” or “this website.”
As you can see here, when natives are correcting strangers there’s particular parts of the page they direct readers’ attention to. The top of the page. The bottom of the page. A notice on the page. So given natives’ attention to what’s going on on the page, it seemed fruitful to look into what parts of the page these savvier web surfers thought were important to read.

This is a moment when natives are trying to instruct strangers how to read on the web – “everyday education” outside of schools. Obviously just reading “Ketchup of the People” and knowing you’re on a blog isn’t enough to help you understand. What is important? How do we know what a page is really about?
Time and again what I saw in the comments was natives making use of URLs and other web addresses to make sense not only of what page they were one, but also who strangers were and how they got there.
Strangers’ URL errors

- http://communionisfromelisawhere/ (Spiders! Ack!)
- http://google/ (Google Answers)
- http://cancel%20e-fax%20service (Cancelling eFax Service)
- http://maury%20povich (Maury's Blooper)
- http://I%20need%20your%20help%20%21%21%21%21%21%21%21%21%21%21%21%21 (Maury's Blooper)
- http://hey/ (Movie: Holes)
- http://microsoftinternetexplorer/ (Google Answers HCI)
- http://dscerbo1.comcast.net/ (Google Answers HCI)
- http://kennedy007.comcast.net/ (Google Answers HCI)
- http://St.%20KITT%27S (Maury's Blooper)
- http://houston.tx/ (Maury's Blooper)
- http://I%20donno%20wat%20this%20is%21 (Movie: Holes)
- http://??url?? (Harry Potter)

By contrast, strangers demonstrated in other ways that they could not make use of URLs. These are links they left along with their comments.

A number of people did put the title of the page they were on, instead of a link to their own website, in the URL field, resulting in links like these attached to their comments.

Or they used the topic of what they were talking about, or a greeting, or the name of their browser, or their email address (again), or their geographic location, or a plain and simple admission that they had no idea what URL meant.
Let’s look at the standard comment form they were probably faced with on a blog. Basically, in order to comment they were asked to make sense of the acronym URL. I should note that this screencap is now a couple of years old; since I took it, it looks like WP and/or Movabletype has changed their standard comment form and that now says “website” instead of URL. But even then – whose website does it want the user to put there?
Recommendations
Discussion in ed tech has been very oriented lately towards being end-users of web apps and other new gadgets, does not focus on the structure of the web which has been with us since before the web

By trying to correct strangers’ sense of context, natives are beginning to express the things that are important to sensemaking on the web: addresses as they relate to pages and a sense of where you are, and a rudimentary knowledge of how search engines choose pages to serve to you.

You might say that a really solid knowledge of how addresses work online or understanding of algorithms is “too much” for some people. But they are among the cues expert searchers use to resolve confusions about their search results.

A little education about addresses and servers would go a long way towards helping people understand where they are.

Also there was a lot of confusion about whether a comment was public or private, being emailed or posted.
Seek (linguistic) disagreements to find places where users are confused

- Possible model for seeking context mismatch in user comments and questions:
  - Identify disagreements
  - Train on opposing arguments
  - Attend to terms about place, people
  - Postdoc...

seeing as indexical phrases – “this page here,” “him” third person assumed to be not party to the conversation, versus “you” second person being assumed to be present – were important to the discussion, perhaps they’re among the semantic elements that should be considered at the query level as well.