Anxiety and Design in the Psiphon Interface

by Mike Edwards

Parsons The New School for Design

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- An examination of the Psiphon web interface as it relates to user performance under timed conditions with induced anxiety.

What Is Psiphon?

- Circumvents national firewalls and other impediments
- Secure Web Server
- Secure Web Client

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- The Client is the focus of this investigation.

Anxiety

- "...the mood in which we feel worried and don't know why we're feeling that way." (Ekman 2004: p. 159)

- Anxiety as the longer-term expression of the fear emotion.

Anxiety and Design

- Fear of failure

- Lack of self-efficacy

- Confusion

Security

- If anxiety is a state of worry...

Security

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- Could security, a lack of worry, be its opposite?

- Or, perhaps, the cure for anxiety in an interface?

The Question

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- And is it possible to improve the existing design to increase feelings of security?

The Experiment

- Test users with the existing web client.

- Also test users with a modified web client designed to highlight a single but important interface feature

  - with the hope of reducing confusion
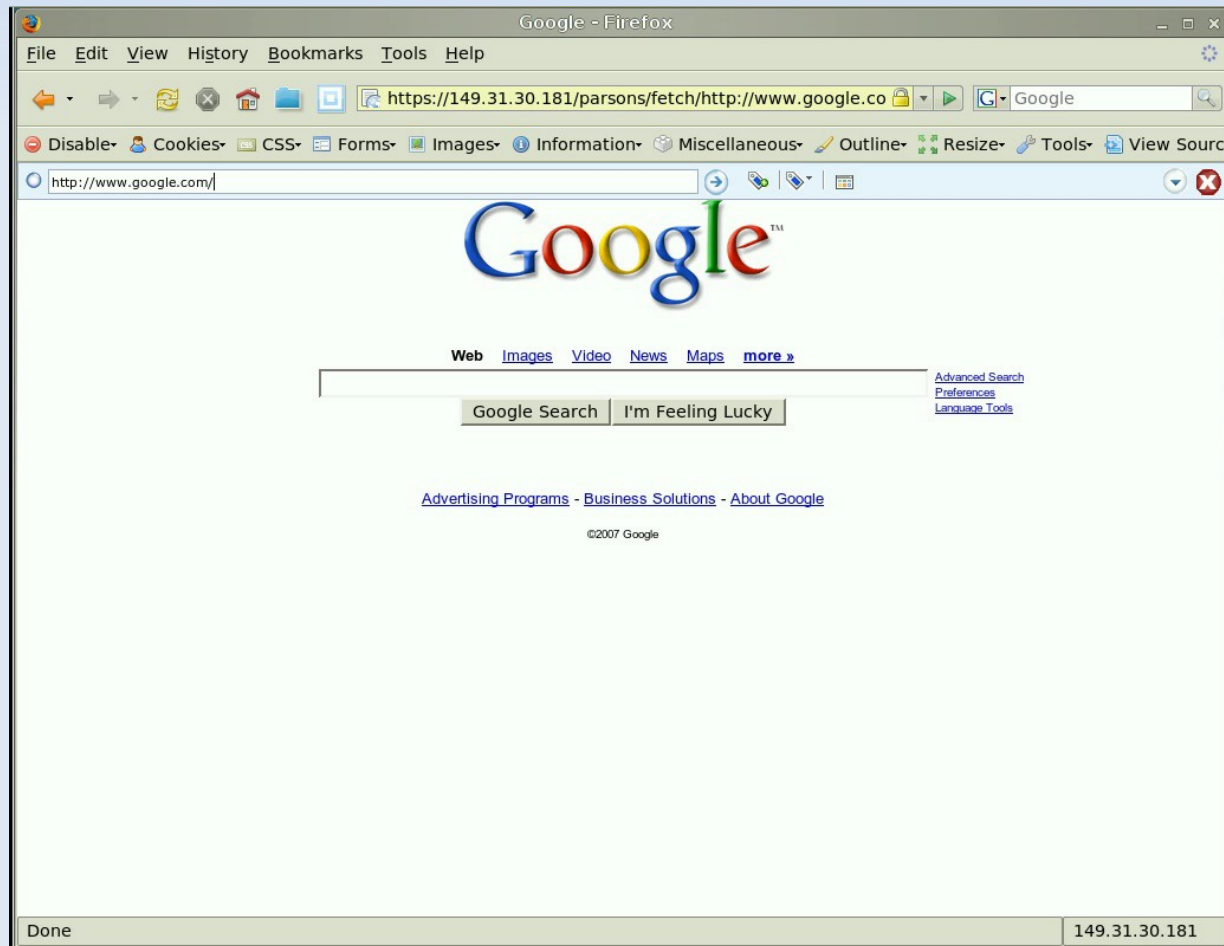
  - and increasing feelings of security

The Experiment

- The original client:
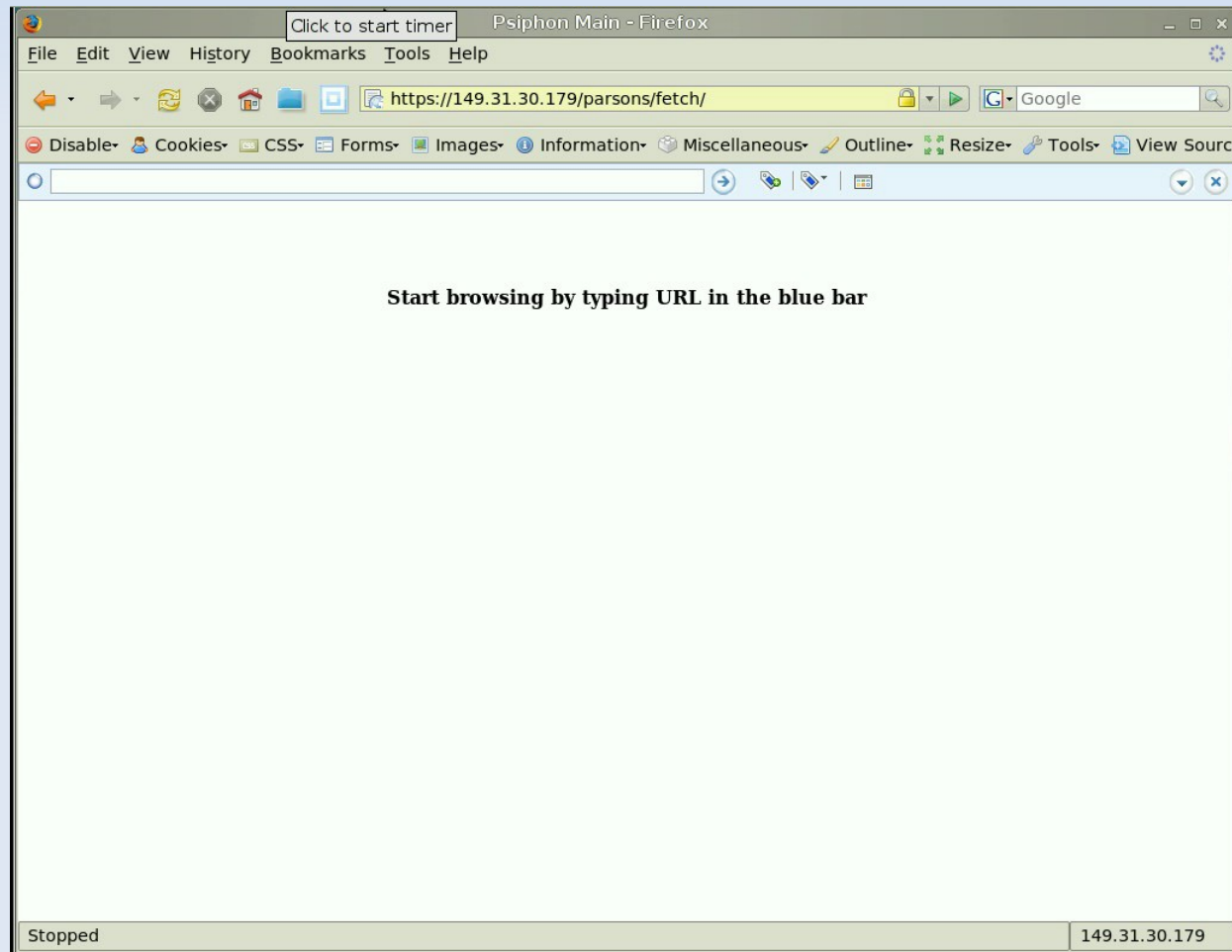
The Experiment

- The modified client (note red close button):

The Experiment

- Users were read the following text:

  - The application we are testing today is called Psiphon. It is a browser within a browser. It is designed to help people in countries that restrict their Internet access by letting web users sneak past the firewall.

The Experiment

- Users were read the following text:

  - The Psiphon browser has many of the same features as the normal browser. It has a URL bar [point to bar], bookmarks [point], and a close button [point].

The Experiment

- Users were read the following text:

  - You may surf the Web through Psiphon for about a minute. Then you will hear an alarm sound. Once you hear that, you must quit Psiphon as quickly as possible.

  - Are you ready?

The Experiment

- 16 users were tested

- 8 used the original browser and 8 user the modified browser

- Each user had one minute in which to surf before an audible alarm played, which was relayed through headphones.

- Each user's session was video recorded using screen capture software.

The Experiment

- After each session, each user filled out the following survey and gave answers on a five-point Likert scale (the wording changed on half of the surveys to ameliorate bias in the questions):

The Experiment

1. I had a difficult [easy] time closing the browsing window.

2. I felt calm [rushed] when I finished the browsing experiment.

3. I took me some time to understand how to quit the application. [I understood how to quit the application right away.]

4. The Psiphon interface does [does not] make me feel secure.

5. When the alarm went off I did not know [did know] what to do.

The Results

- Strong correlation (.59) between Q1 and Q3

  - Essentially the same question, useful as a check.

- Moderate correlation (.43) between Q3 and Q5

  - Intuitively, this makes sense.

- Extremely weak correlation between Q1 and Q5 (.11).

  - May indicate that difficulty with the browser is unrelated to any anxiety produced by the alarm.

  - At the very least, the alarm may not have confused the subjects with regard to closing the browser.

The Results

- Moderate correlation (.41) between Q2 and Q3

  - Seems to indicate that people report feeling calm, though they do not understand very well how to close browser.

  - This may suggest that understanding how to close the browser is not a source of anxiety in this sample.

The Results

- Weak correlations between all other responses to questions.

The Results

- This includes Q4, the reporting of security with Psiphon.

  - No relationship found between reports of calmness and feeling secure or between sense of competancy and feeling secure.

  - This again may indicate that, in this sample of adults living in the U.S., security with regard to browsing is unrelated to other causes of anxiety in the experiment.

  - This may make the U.S. subjects an interesting norm to compare against subjects from, or in, one of the countries for which Psiphon is intended.

The Results

- Averaging "negative" responses into an anxiety score, with low numbers indicating more negative attitudes (0.00 - 5.00), the following results show:

    - On average, users in the "red" group have a less negative response (3.93/5.00) than the "blue" group (3.5/5.00).

    - Unfortunately, the T test for these results is .17, indicating that the difference is not statistically significant.

The Results

- Other observations:
  - Two users surfed using the main browser location bar instead of through Psiphon.
    - This is profoundly dangerous
    - Worse than not using Psiphon at all, due to false sense of safety
  - At least 4 users indicated that they had trouble closing the browser due to the pop-up dialog not being prominent.
  - Hot-keys (e.g. CTRL-L) were mentioned as a possible problem with main browser.

Conclusions

- No observable correlation between feelings of calmness or efficacy and feelings of security with Psiphon.

  - The U.S. subjects, however, may make a useful norm against which other subjects' responses may be compared.

- Observed but not statistically significant improvement in user responses with more prominent close button.

Conclusions

- Serious user issues resulting from confusion with main and Psiphon browser windows, pop-ups, expected browser behavior.

Recommendations

- Continue the study, with larger test sample, until the T test shows significance between "red" and "blue" group results.

- Closely observe user mouse movements within and around Psiphon browser space for indications of confusion.

Recommendations

- Address issue of exposed and potentially dangerous main browser location bar:

  - Hiding the bar would be ideal

  - Make the Psiphon browser area much more prominent.

- Add an additional field to the survey for the user to indicate their experience level with computers, novice through expert. In a larger sample, interesting comparisons may be drawn.