Computer Rage:
Exploring Distributions of Frustration and Dealing with Issues in the Analysis of an Online Survey

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Frustration Theory

Most behavior is goal directed.

Problem solving occurs when there are obstacles between the current state and the desired goal state.

While rationale problem solving involves the search for and testing of alternative solutions, sometimes obstacles can also cause a sense of frustration.

When frustration exceeds a person’s limit to control it, rage can occur.
Frustration Theory + Computers

- A significant proportion of our problem solving is computer mediated.
- A significant proportion of the obstacles to achieving our desired goals are computer generated.
- A major source of frustration is the result of interacting with computers.
- The outcome is “computer rage.”
What is Computer Rage?

- Physical Bashing of a Computer and/or a Computer Related Item
- Verbal Abuse of a Computer and/or a Computer Related Item (Brinks, 2004)
- Heightened Physiological Response with Associated Feelings of Anger and Frustration (Lazar, Jones, Bessiere, Ceaparu, & Shneiderman, 2004)
Full Theory of Computer Rage

Computerpannen (nicht selbstverschuldet) (1)
- Abwesenheit
- Ausfallzeiten
- Instabiles Netzwerk
- Idiosynkratische Software

Frustration (trocken) (2)
R² = 0,34

Wahrnehmung (3a)
Ich rede mit meinem PC
R² = 0,03

Wahrnehmung (3b)
PC stürzt mit Absicht ab
R² = 0,03

Stressoren (5)
- Zeitdruck
- Wichtigkeit des Ziels
- Qualität des Supports (subjektiv)

Support -0,10
Stress n.s.

„Lernen am Modell“ (8)
- Aggressives Verhalten von Kollegen

Korrelationen:
- Frustration mit
  - Allg. Arbeitszufriedenheit: -0,30
  - Allg. Lebenszufriedenheit: -0,26
  - Flucht: 0,35
  - Resignation: n.s.

Aggression (7)
- (Reis)chimpfen
- Schlägen
- Drohen
R² = 0,37

Personliche Merkmale (4)
- Geschlecht (Mann = 1)
- Alter
- Einstellung gegenüber Gewalt

Anwenderfähigkeiten (6)
- Technisches Verständnis
- Technisches Interesse
- Anwenderkompetenzen
R² = 0,07

Ges. 0,19
Alter: n.s.

Ges. 0,13
Alter: 0,15

Geschlecht: n.s.
Alter: -0,11
Gewalt: 0,20 (wenn Gewalt ja, dann Agg).

N = 340,
B-Koeffizienten und Korrelationen signifikant bei p < 0,05
*: sig p < 0,1
Simple Theory of Computer Rage

Microsoft → Rage
Online Survey Sample

lap.umd.edu/computer_rage

Total sample N = 2141

US sample N = 1054, from 5/15/2002 to 1/30/2005 with a massive spike from 12/12/2004 to 1/21/2005 as result of media exposure (Baltimore Sun, Kojo Nnamdi Show, Future Tense, WUSA Channel 9 News)
Issues with Online Surveys

- Nonrandom sample from the population ... age, gender, experience, etc. can be assessed.
- Bias due to self selection ... but which way?
- Bias due to context and framing ("Computer Rage") ... but which way?
Demographics

Mean = 34.7
N = 833

Mean = 32.9
N = 221
Average number of hours per week on computers

- Males
- Females

0 200 400 600 800
0 100 200 300 400 500 600 700 800

- 0
- 1-3
- 4-6
- 7+
Average number of hours per week on the WWW

[Bar chart showing the average number of hours spent on the WWW by males and females. The chart indicates that a significant portion of males spend 7+ hours per week on the WWW, while females have a lower distribution with a slight peak in the 1-3 hours range.]
Overall how frustrated are you with computers?

**Males**
- mean = 3.72
- sd = 2.25

**Females**
- mean = 4.84
- sd = 2.23

**t(1045) = 6.54, p < .001**

Chi-Square (8) = 60.8, p < .001
Have you ever been angry with a computer?

- **Males**:
  - Mean: 4.81
  - SD: 2.49

- **Females**:
  - Mean: 5.89
  - SD: 2.25

\[ t(1044) = 5.81, p < .001 \]

Chi-Square (8) = 38.90, \( p < .001 \)

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</table>
How frustrated do you get when the computer crashes and has to be restarted?

**Males**
- Mean: 3.72
- SD: 2.25

**Females**
- Mean: 4.84
- SD: 2.23

\[ t(1045) = 6.5, \ p < .001 \]

**Chi-Square (8) = 50.82, \ p < .001**
To what extent have you been frustrated waiting for a computer to do something?

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<tr>
<td>9</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**Chi-Square (8) = 32.43, p < .001**

**t(1047) = 4.42, p < .001**

**Males**

- Mean: 5.58
- SD: 2.65

**Females**

- Mean: 6.44
- SD: 2.21
How often have you been frustrated because you had to redo something over and over because of a computer problem?

![Bar chart showing the percentage of males and females who have experienced frustration due to computer problems.

- Males:
  - Mean: 4.65
  - SD: 2.57

- Females:
  - Mean: 5.43
  - SD: 2.30

Chi-Square (8) = 32.25, p < .001

- Not at all
- Somewhat
- Often
- Very much

- t(1051) = 4.11, p < .001
How annoying is it to you to use a mouse to move a cursor around the screen?

- **Males**
  - Mean: 2.37
  - SD: 2.25

- **Females**
  - Mean: 3.26
  - SD: 2.61

T-test: \( t(1049) = 4.96, p < .001 \)

Chi-Square: \( \chi^2(8) = 41.24, p < .001 \)
How irritated have you been by how hard it is to read the computer screen?

- Males: mean = 2.72, sd = 2.10
- Females: mean = 3.46, sd = 2.35

$t(1042) = 4.51, p < 0.01$

Chi-Square (8) = 34.97, $p < .001$
How annoyed have you been because of typing errors on a computer?

- **Males**
  - Mean = 3.14
  - SD = 2.32

- **Females**
  - Mean = 3.54
  - SD = 2.23

\[ t(1042) = 2.26, p > .01 \]

Chi-Square (8) = 28.93, \( p < .001 \)

Percent

Not at all | Rating | Very annoyed
--- | --- | ---
1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

- 0
- Mean = 3.14
- SD = 2.32
- t(1042) = 2.26, p > .01
- Chi-Square (8) = 28.93, \( p < .001 \)
How frustrated have you been by not understanding how the computer works?

**Males**
- mean = 2.59
- sd = 2.12

**Females**
- mean = 4.38
- sd = 2.65

$t(1049) = 10.43$, $p < .001$

Chi-Square $(8) = 117.64$, $p < .001$
How frustrated have you been when you could not figure out how to get the computer to do something that you wanted?

mean = 4.67  
sd = 2.76  
Females: mean = 6.10, sd = 2.50  
t(1050) = 7.00, p < .001

Chi-Square (8) = 57.50, p < .001
How frustrating are computer manuals and documentation to you?

- **Males**: mean = 4.39, sd = 2.80
  - Chi-Square (8) = 46.90, p < .001
- **Females**: mean = 5.79, sd = 2.61
  - t(1045) = 6.69, p < .001

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**Mean Ratings**

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<tr>
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<td>13.7%</td>
<td>26.6%</td>
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<td>11.1%</td>
<td>7.9%</td>
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<td>8.6%</td>
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<tr>
<td>Females</td>
<td>8.7%</td>
<td>10.8%</td>
<td>24.4%</td>
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<td>11.1%</td>
<td>8.6%</td>
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<td>9.2%</td>
<td>6.3%</td>
<td>5.2%</td>
<td></td>
</tr>
</tbody>
</table>
How annoyed have you been by computer help systems not giving you answers?

Mean and standard deviation:

- Males: mean = 5.91, sd = 2.83
- Females: mean = 6.63, sd = 2.43

T-test:

\[ t(1046) = 3.47, \quad p < .001 \]

Chi-square:

\[ \chi^2(8) = 20.20, \quad p < .01 \]

Rating distribution:

- Not at all: Males = 5, Females = 3
- Very annoyed: Males = 9, Females = 8
How annoyed have you been with computer help desks and hot lines?

For males:
- Mean = 5.58
- Standard Deviation = 2.97

For females:
- Mean = 5.91
- Standard Deviation = 2.72

Chi-Square (8) = 12.06, p > .05

t(1036) = 1.47, p > .05
How frustrating is it trying to find information on the World Wide Web?

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<tr>
<td>9</td>
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</table>

Chi-Square (8) = 29.28, p < .001

Mean = Males: 3.04, Females: 3.72
Std Dev = Males: 2.10, Females: 2.29

t(1046) = 4.16, p < .001
How annoyed are you by too much email?

**Chi-Square (8) = 20.77, p < .01**

<table>
<thead>
<tr>
<th>Rating</th>
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<th>Females</th>
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<td>9</td>
<td>4.0</td>
<td>3.3</td>
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</table>

mean = 4.14  
mean = 5.00  

sd = 2.71    
sd = 2.78    

t(1048) = 4.16, p < .001
How frustrated have you gotten when trying to set up a new computer system?

Chi-Square (8) = 60.88, p < .001

Males
mean = 3.26
sd = 2.45

Females
mean = 4.61
sd = 2.60
t(1046) = 7.18, p < .001
How frustrated have you gotten when trying to install new software?

- Males: mean = 3.58, sd = 2.42
- Females: mean = 4.79, sd = 2.56

$t(1050) = 6.53, p < .001$

Chi-Square (8) = 51.98, p < .001
How irritating has it been for programs to become obsolete and having to upgrade to new versions?

Mean and standard deviation for Males and Females:
- Males:
  - Mean: 4.71
  - Standard Deviation: 2.84
- Females:
  - Mean: 6.02
  - Standard Deviation: 2.54

Test statistic:
- $t(1045) = 6.25$, $p < .001$

Chi-square test:
- Chi-square (8) = 68.00, $p < .001$
Have you ever wanted to throw your monitor out of a window?

- **Males**
  - mean = 3.63
  - sd = 2.87

- **Females**
  - mean = 4.44
  - sd = 2.93

$t(1043) = 3.68$, $p < .001$

Chi-Square (8) = 26.46, $p < .001$
Have you ever felt like smashing a computer screen with a heavy object?

- **Males**
  - Mean = 4.11
  - SD = 2.98

- **Females**
  - Mean = 4.75
  - SD = 2.88

$t(1044) = 2.84, p < .01$

Chi-Square (8) = 22.64, $p < .01$
Age and Frustration

Age was negatively correlated with frustration:
- waiting for the computer, $r = -0.18$
- having to redo something, $r = -0.15$
- computer crash, $r = -0.10$

Age was negatively correlated with
- being angry with a computer, $r = -0.22$
- desire to smash the screen, $r = -0.25$
- desire to throw monitor out the window, $r = -0.24$
Experience Factors and Frustration

- Number of hours on the computer and the WWW was correlated, \( r = .54 \).

- Both of these experience factors were negatively correlated with frustration on all factors except with help systems, help desks, and email.
Students versus Others

There were 277 students (undergraduates and graduates) and 629 others (employed, not employed, etc).

Students had an average age of 23.7 and others 38.7.

Others were significantly more frustrated than students on the following factors:

- reading a computer screen
- manuals and documentation
- help desks and hot lines
- too much email
- installing new software
- upgrading to new versions
A factor analysis on 20 scales resulted in four components:

- overall frustration (the “F” component) which loaded on all scales.
- a physical acts of frustration (the “P” component, e.g., desired to smash, break)
- irritation with the interface (the “I” component, e.g., mousing, typing, reading)
- lack of help (the “H” component, not understanding the computer, frustration with help systems and help desks)
Incidence of Rage Behaviors by Gender

- Dropped a computer on the floor
- Broke a computer screen
- Ripped out a computer cable
- Kicked a computer
- Slammed a keyboard down
- Slammed a mouse
- Popped off keys from a keyboard
- Scratched or bent a CD ROM disk
- Bent or mutilated a computer disk
- Cursed a computer out loud

Percent within Gender
Incidence by Age and Status

- There is virtually no difference in proportions of behaviors reported by students and others.
- There is no difference in proportions of behaviors reported by age (using a median split).
The Down Side of Computer Rage

- Destruction of personal, business, or government property (estimates are in the millions of dollars annually)
- Potential injury to self or others
- Loss of personal time or time on the job
The Up Side of Computer Rage

- Release of “pent” up anger
- Directed at physical objects rather than other people
- Can be personally rewarding
- Helps to reduce inventory of older equipment and increase purchase of new equipment
Good Practices of Computer Rage

- Controlled Rage: Find the appropriate time, place, and method.

- Safety First: Use safety googles and protect others.

- Select Targets Wisely: Preferably Vent on Obsolete Equipment.

- Consider Vicarious Computer Rage: Buy our Computer Rage I and II DVDs.
The End

Now who's made the "fatal error"?