

# CSC 495.002 – Lecture 13

## Privacy Perceptions: Westin Categories

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Fall 2017

PREVIOUSLY ON USABLE PRIVACY

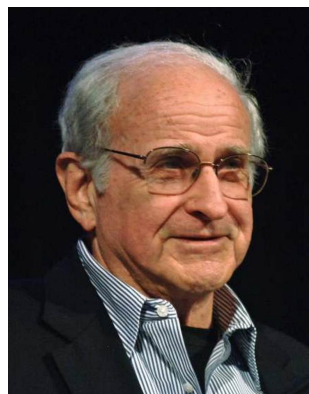
## Usable Privacy

- Humans and Decision Making
- Nudges and Warnings
- Privacy Policies
- Privacy Notices

## What You Will Learn

- Westin's privacy index
- Privacy perceptions among cultures, age groups
- User mental models about privacy

## Westin's Privacy Index



- Alan Westin half a century ago defined the modern right to privacy before the Web era
- Three categories: Fundamentalist, pragmatist, unconcerned

## Westin's Original Survey

- Try yourself: <http://go.ncsu.edu/westin>
- Fundamentalist:
  - Agree (strongly or somewhat) with “Consumers ...”; AND
  - Disagree (strongly or somewhat) with “Most businesses ...”; AND
  - Disagree (strongly or somewhat) with “Existing laws ...”.
- Unconcerned: Opposite of fundamentalist: Disagree, agree, agree
- Pragmatist: Anyone who is not a fundamentalist or unconcerned

## Applicability of Westin's Survey

- Conduct human subject research on privacy
- Compare reported behavior vs actual privacy related actions
- Organizations might use this data to target pragmatists
- Provides insights for organizations to respond to privacy concerns with appropriate policies, products, and services

# Privacy Indexes: A Survey of Westin's Studies

Carnegie Mellon University  
Research Showcase @ CMU

Institute for Software Research

School of Computer Science

2005

## Privacy indexes : a survey of Westin's studies

Ponnurangam Kumaraguru  
*Carnegie Mellon University*

Lorrie Faith Cranor

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Kumaraguru and Cranor. Privacy indexes: A survey of Westin's studies. 2005

Dr. Özgür Kafalı

Privacy Perceptions: Westin Categories

Fall 2017

6 / 54

## Overview

- Westin conducted over 30 privacy-related surveys between 1978 and 2004
- Surveys cover general privacy, consumer privacy, medical privacy, etc
- Created a “Privacy Index” to summarize results and show trends in privacy concerns
- Study looked at 14 surveys (some are not available even in paper format)

## Summary of Surveys

Year	Name of study	Report / Summary found	Source type
1990	Equifax Executive Summary	Summary	Online
1991	Harris-Equifax Consumer Privacy Survey	Report	Hard copy
1992	Equifax Executive Summary	Summary	Online
1993	Health Information Privacy Survey	Report	Hard copy
1994	Equifax-Harris Consumer Privacy Survey	Report	Hard copy
1995	1995 Equifax / Harris Consumer Privacy Survey	Summary	Online
1996	Equifax-Harris Consumer Privacy Survey	Report	Hard copy
1997	The results of Commerce, Communication, and Privacy Online for Privacy & American Business	Summary	Online
1998	E-Commerce & Privacy: What Net Users Want	Report	Hard copy
1998	The Privacy Concerns and Consumer Choice	Summary	Online
1999	DoubleClick, Inc. and Privacy & American Business	Summary	Online
1999	Freebies and Privacy: What Net Users Think	Summary	Online
2001	Privacy On & Off the Internet: What Consumers Want	Report	Hard copy
2003	Most People Are "Privacy Pragmatists" Who, While Concerned about Privacy, Will Sometimes Trade it Off for Other Benefits	Summary	Online

## General Privacy Concern Index

- Harris - Equifax Consumer Privacy Survey (1990 and 1991)
- The short survey asked:
- Whether they are very concerned about threats to their personal privacy today
- Whether they agree strongly that business organizations seek excessively personal information from consumers
- Whether they agree strongly that the Federal government since Watergate is still invading the citizen's privacy
- Whether they agree that consumers have lost all control over circulation of their information

## General Privacy Concern Evaluation

- High: 3 or 4 privacy-concerned answers
- Moderate: 2 privacy-concerned answers
- Low: 1 or no privacy-concerned answers

## Fundamentalist

- Fundamentalists are generally distrustful of organizations that ask for their personal information, worried about the accuracy of computerized information and additional uses made of it, and are in favor of new laws and regulatory actions to spell out privacy rights and provide enforceable remedies. They generally choose privacy controls over consumer-service benefits when these compete with each other.

## Pragmatist

- They weigh the benefits to them of various consumer opportunities and services, protections of public safety or enforcement of personal morality against the degree of intrusiveness of personal information sought and the increase in government power involved. They look to see what practical procedures for accuracy, challenge and correction of errors the business organization or government agency follows when consumer or citizen evaluations are involved. They believe that business organizations or government should “earn” the public’s trust rather than assume automatically that they have it. And, where consumer matters are involved, they want the opportunity to decide whether to opt out of even non-evaluative uses of their personal information as in compilations of mailing lists.

## Unconcerned

- The Unconcerned are generally trustful of organizations collecting their personal information, comfortable with existing organizational procedures and uses are ready to forego privacy claims to secure consumer-service benefits or public-order values and not in favor of the enactment of new privacy laws or regulations.

## Consumer Privacy Concern Index

- The two-question survey (1991) asked participants to agree/disagree with the following statements:
- Consumers have lost all control over how personal information about them is circulated and used by companies
- My privacy rights as a consumer in credit reporting are adequately protected today by law and business practices
  
- Low concern: Not take the privacy-oriented position on either of the statements
- Moderate concern: Take one of the two pro-privacy views
- High concern: Take the strongest privacy-oriented position on both of the statements

## Medical Sensitivity Index

- Harris-Equifax Health Information Privacy Survey (1993)
- Included the following questions and statements:
- Do you believe (EACH ITEM) has ever disclosed your personal medical information in a way that you felt was improper?
  - Health insurance companies
  - A clinic or hospital that treated you or a family member
  - Public health agencies
  - Your employer or a family member's employer
  - A doctor who has treated you or a family member
  - A pharmacy who filled a prescription for you or a family member
- It concerns me that my medical information is being seen today by many organizations beyond those that I use for healthcare
- Under national health-care reform, each person might be assigned an identification number for health insurance purposes. How concerned would you be to have such a health information number assigned to you?



## Computer Fear Index

- Part of the 1993 study, Westin also created the “Computer Fear Index”
- Included the following questions and statements:
- If privacy is to be preserved, the use of computers must be sharply restricted in the future
- How concerned are you that many health care providers you use today employ computers in some of their operations, such as patient billing and accounting, laboratory work, and keeping some medical records?
- Under national health care reform, computers are expected to be used extensively to manage and monitor operations. Some of these uses will involve individual medical records. In general, would such use of computers worry you?

## Fear of Computers

- High Computer Fear: 22%
- Medium Computer Fear: 32%
- Low Computer Fear: 47%

## Distrust Index

- Equifax-Harris consumer privacy report – 1994
- Agree/disagree the following statements:
- Technology has almost gotten out of control
- Government can generally be trusted to look after our interests
- The way one votes has no effect on what the government does
- In general business helps us more than harm us
- High distrust: 31%, Medium: 38%, Low: 26%

## Privacy Concern Index

- Equifax-Harris consumer privacy report – 1996
- Included questions like:
- Have you personally ever been the victim of what you felt was an improper invasion of privacy, or not?
- The providers of on-line services should be able to track the places users go on the Internet in order to send these users targeted marketing offers
- Healthcare system researchers sometimes use patient records to study the value and costs of specific medications and treatments in order to improve programs for handling diseases. These researchers do not release any information that would identify specific patients. If your identity were kept strictly confidential, AND obtaining your permission in advance was NOT feasible, how acceptable would it be for your medical information to be used?

## 1990 vs 2000

	Strongly / Somewhat Agree	Strongly / Somewhat Disagree	Strongly / Somewhat Agree	Strongly / Somewhat Disagree
Consumers have lost all control over how personal information is collected and used by companies.	80	20	77	20
Most businesses handle the personal information they collect about consumers in a proper and confidential way.	64	34	54	43
Existing laws and organizational practices provide a reasonable level of protection for consumer privacy today	59	38	51	47

## Changes in Privacy Perception

- What this documents is something that makes good sense in terms of what we see happening all around us - that unconcern about privacy among the public has dropped, and 88% of the public now registers Medium to High consumer privacy concerns. But it also suggests that Privacy Fundamentalism is NOT increasing. Instead, an even larger segment of the public than in the mid to late 1990's, almost two-thirds, is adopting the Privacy Pragmatist - show me and let me decide - position.

## Core Privacy Orientation Index

- Studies from 2000–2001
- Fundamentalists: 25%
- Unconcerned: 12%
- Pragmatists: 63%

## Final Survey: Question 1

- Harris Privacy Survey – 2003
- Consumers have lost all control over how personal information is collected and used by companies
- 69% of adults agree: A decline of eleven points from 80% who felt this way in 1999

## Final Survey: Question 2

- Most businesses handle the personal information they collect about consumers in a proper and confidential way
- 54% of the public disagree: An increase of nineteen points from only 35% who felt this way in 1999

## Final Survey: Question 3

- Existing laws and organizational practices provide a reasonable level of protection for consumer privacy today
- 53% of all adults disagree: An increase of fifteen points from 38% in 1999

## Final Categories

- Study from 2003
- Fundamentalists: 26%
- Unconcerned: 10%
- Pragmatists: 64%

## Summary of Categories Over Time

Year of Study	Index	Category name with % of population in the study
1990 [10]	General Privacy Concern Index	Privacy Fundamentalists - 25%
		Privacy Unconcerned - 18%
		Privacy Pragmatists - 57%
1990 [10]	Consumer Privacy Concern Index	High Concern - 41%
		Medium Concern - 39%
		Low Concern - 20%
1991 [10]	Consumer Privacy Concern Index	High Concern - 46%
		Medium Concern - 36%
		Low Concern - 17%
1993 [12]	Medical Sensitivity Index	High - 13%
		Medium - 45%
		Low - 42%
1993 [12]	Medical Privacy Concern Index	High - 48%
		High - 22%
		Medium - 32 %
1993 [12]	Consumer Fear Index	Low - 47 %
		High Distrust - 31%
		Medium Distrust - 38%
1994 [13]	Distrust Index	Low Distrust - 26%
		No Distrust - 5%
		Privacy Fundamentalists - 25%
1996 [15]	Privacy Concern Index	Privacy Unconcerned - 16%
		Privacy Pragmatists - 59%
		Privacy Fundamentalists - about 25%
1995 - 1999 [4]	Privacy Segmentation Index	Privacy Unconcerned - about 20%
		Privacy Pragmatists - about 55%
		Privacy Fundamentalists - 25%
Mid - 2000 [4]	Core Privacy Orientation Index	Privacy Unconcerned - 12%
		Privacy Pragmatists - 63%
		Privacy Fundamentalists - 34%
Late - 2001 [4]	Core Privacy Orientation Index	Privacy Unconcerned - 8%
		Privacy Pragmatists - 58%
		Privacy Fundamentalists - 26%
2003 [8]	Core Privacy Orientation Index	Privacy Fundamentalists - 26%

## Summary of Questions

Year of study	Criteria used for deriving the privacy index
1990 (General Privacy Concern Index)	<p>Whether they are very concerned about threats to their personal privacy today.</p> <p>Whether they agree strongly that business organizations seek excessively personal information from consumers.</p> <p>Whether they agree strongly that the Federal government since Watergate is still invading the citizen's privacy.</p> <p>Whether they agree that consumers have lost all control over circulation of their information.</p>
1991 (Consumer Privacy Concern Index)	<p>Agreement for the statements :</p> <p>Consumers have lost all control over how personal information about them is circulated and used by companies</p> <p>My privacy rights as a consumer in credit reporting are adequately protected today by law and business practices</p>
1993 (Medical Privacy Concern Index)	<p>Ever used the services of a psychologist, psychiatrist, or other mental-health professional.</p> <p>Do you believe your personal information has been disclosed? And there were other 4 questions which were all related to medical information.</p>
1993 (Computer Fear Index)	<p>If privacy is to be preserved, the use of computers must be sharply restricted in the future.</p> <p>Concern level in usage of computers in medical services (patient billing, accounting)</p>
1994 (Distrust Index)	<p>Technology has almost gotten out of control</p> <p>Government can generally be trusted to look after our interests</p> <p>The way one votes has no effect on what the government does</p> <p>In general business helps us more than harm us</p>
1995 – 2003 (Privacy Segmentation & Core Privacy Orientation Index)	<p>Consumers have lost all control over how personal information is collected and used by companies.</p> <p>Most businesses handle the personal information they collect about consumers in a proper and confidential way.</p> <p>Existing laws and organizational practices provide a reasonable level of protection for consumer privacy today.</p>

## Criticism

- Electronic Privacy Information Center (EPIC) called Westin's 'Fundamentalist' category 'pejorative'
- They argued being a fundamentalist is reasonable and not to be seen as being paranoid about privacy issues
- Other concerns about the biases of computer use

# Would a Privacy Fundamentalist Sell Their DNA for \$1000?

Would a privacy fundamentalist sell their DNA for \$1000...  
if nothing bad happened as a result?

The Westin categories, behavioral intentions,  
and consequences

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## ABSTRACT

Westin's Privacy Segmentation Index has been widely used to measure privacy attitudes and categorize individuals into three privacy groups: fundamentalists, pragmatists, and un-concerned. Previous research has failed to establish a robust correlation between the Westin categories and actual or intended behaviors. Unexplored however is the connection between the Westin categories and individuals' responses to the consequences of privacy behaviors. We use a survey of 884 Amazon Mechanical Turk participants to investigate the relationship between the Westin Privacy Segmentation Index and attitudes and behavioral intentions for both privacy-sensitive scenarios and privacy-sensitive consequences. Our results indicate a lack of correlation between the Westin categories and behavioral intent, as well as a lack of correlation between the Westin categories and consequences. We discuss potential implications of this attitude-consequence gap.

Nonetheless, concerns have long existed regarding the predictive power of Westin's categories and the assumptions underlying his Privacy Segmentation Index. First, previous research has failed to establish a significant correlation between the Westin categories (which capture broad, generic privacy attitudes) and context-specific, privacy-related behaviors, either actual or intended [13, 23, 29]. Second, researchers have raised concerns regarding unstated assumptions underlying the index, which presumes individuals make privacy decisions that are highly rational, reflective, and informed [42]. Instead, scholars have posited that incomplete information or decision-making biases, among other factors, may cause a gap between the general attitudes captured by the Westin categories and actual, specific privacy behavior [4]. Third, the instrument has not been updated since approximately 1995, and it is not obvious that it remains current in our Internet-centric world.

It is worth considering that specific attitudes look as

Woodruff et al. Would a Privacy Fundamentalist Sell Their DNA for \$1000... If Nothing Bad Happened as a Result? The Westin Categories, Behavioral Intentions, and Consequences. Symposium on Usable Privacy and Security (SOUPS), pages 1-18, 2014

Dr. Özgür Kafalı

Privacy Perceptions: Westin Categories

Fall 2017

30 / 54

## Objectives

- Explore the connection between Westin categories and individuals' responses to consequences of privacy behaviors
- Is there a correlation between Westin categories and behavioral intent?
- Is there a correlation between Westin categories and consequences?



## Limitations of Westin Categories

- Establish a significant correlation between Westin categories (broad, generic privacy attitudes) and context-specific privacy behaviors (actual or intended)
- Unstated assumptions underlying the categories: Presumes individuals make rational and informed privacy decisions
- Not updated since 1995: Not obvious it remains current in our Internet world

## Misalignments with Westin Privacy Index

- Numerous studies on attitude–behavior dichotomy (Privacy Paradox)
- General survey questions vs context-specific scenarios
- Participants do not live up to their self-reported privacy preferences
  - Online shopping and other hypothetical e-commerce scenarios
  - What participants said they care vs what they post on Facebook
  - Location based services
  - Law enforcement's access to cell phone data

## Alternatives to Westin

- More specific questions
- Internet Users' Information Privacy Concerns (IUIPC)
- Privacy Concern Scale (PCS)
- Scenario based, focus group discussions:
  - Surveillance
  - Location tracking
  - Photo sharing
  - Self-disclosure/relationship building
  - Identity theft
  - Health disclosure

## Study Goals

- Explore the relationships among
  - Generic privacy attitudes (including Westin Categories)
  - Responses to hypothetical scenarios (diverse situations)
  - Responses to outcomes
  - Personality traits
  - Demographics

## Study Design

- Two-phase study
- Phase I:
  - Survey that includes measures of general privacy attitudes
  - Survey on personal characteristics (psychology literature)
- Phase II: Participants imagine themselves in three randomly chosen scenarios (out of 20)
  - Financial
  - Health
  - Location
  - Social

## Exercise: DNA Scenario

- A marketing company offers you \$1000 and free genetic testing in exchange for the rights to all your current and future medical records. They will have the right to resell or publish your data (anonymously or with information that could identify you, at their discretion).
- Main question: How likely would you be to take the offer?
- (1) Not at all Likely
- (2) Slightly Likely
- (3) Moderately Likely
- (4) Very Likely
- (5) Extremely Likely

## Additional Questions about the Scenarios

- Understand participants feelings about the scenario
- Their confidence that they could make a good decision
- How well they thought they could foresee what might happen if they disclosed the information
- How risky they felt it would be to disclose the information
- How much choice they felt they had about whether or not to disclose the information
- How much control they thought they would have over what happened to the information if they disclosed it
- How likely it was that they would be in this situation
- How advantageous/disadvantageous the scenario was overall, in the best case, and in the worst case for themselves, their friends and family, and members of society

## Scenario Consequences

- Presented the participants with three outcomes (randomly chosen) for each scenario
- Positive, negative, and neutral implications for privacy and well-being

## DNA Scenario: Outcome 1

- Your medical data is combined with that of many others. It is used to find a new cure for a previously deadly disease. Neither you nor anyone in your family has this disease.

## DNA Scenario: Outcome 2

- Your data is published with information that identifies you. You lose a job due to your genetic information, which falsely suggests you may later develop a serious medical condition.

## DNA Scenario: Outcome 3

- Your data is used to calculate the probability of certain diseases developing within your family. As a result, some of your relatives (but not you) see an increase of several hundred dollars a year in their health insurance premiums.

## DNA Scenario: Outcome 4

- Your test results reveal that you have a serious but treatable disease of which you were previously unaware. You receive treatment just in time to make a full recovery.

## Exercise: Scenario 4

4. Your favorite retail store offers you a free loyalty card. You will save an estimated 10% on all store purchases you make when you present the card. To obtain the card, you are required to fill out a form with your name, address, and phone number, which may then be associated with a list of your purchases.
- (a) The retail store sells your data to your health insurance company. Your health insurance company analyzes your purchases, and concludes you have a sedentary lifestyle and an unhealthy diet. They raise your insurance rates.
  - (b) You start receiving coupons from the retail store for products you frequently purchase. You end up saving 20% on your store purchases during the year.
  - (c) Based on your purchasing patterns, the retail store builds a profile of you and sells it to national marketing companies. You receive tailored offers to which you are susceptible, and end up making some purchasing decisions you would not make normally and that you ultimately regret.
  - (d) Your nosy neighbor works at the store. Against the company's rules, they look up the record of all your purchases. They learn that you bought some books about which you are slightly embarrassed. They tease you about the books, although they don't tell anyone else.

## Exercise: Scenario 5

5. Your friends are all using a social networking application that lets them publicly share their location online, along with their first names. For example, whenever they arrive at a coffee shop or a bar, they can post that they are currently visiting that place. Your friends ask you to start using the application too, so you can coordinate social activities more easily.
- (a) You post that you are at your neighborhood coffee shop. Unbeknownst to you, a good friend is visiting from out of town. Your friend notices your post and stops by the coffee shop to say hi. You have a great time catching up.
  - (b) You start receiving email coupons from the places you've visited, as well as shops near those places.
  - (c) The editor at your city's newspaper notices that you go to a lot of performances by cool but obscure bands. They invite you to start writing music reviews for the paper, and you eventually become a minor celebrity.
  - (d) A con artist looks up all the locations you have posted. They use the information to strike up a friendship with you, and they ask you for money for an investment opportunity. You invest several thousand dollars, and then you find out the investment opportunity was fraudulent. You feel betrayed and you never get your money back.

## Exercise: Scenario 12

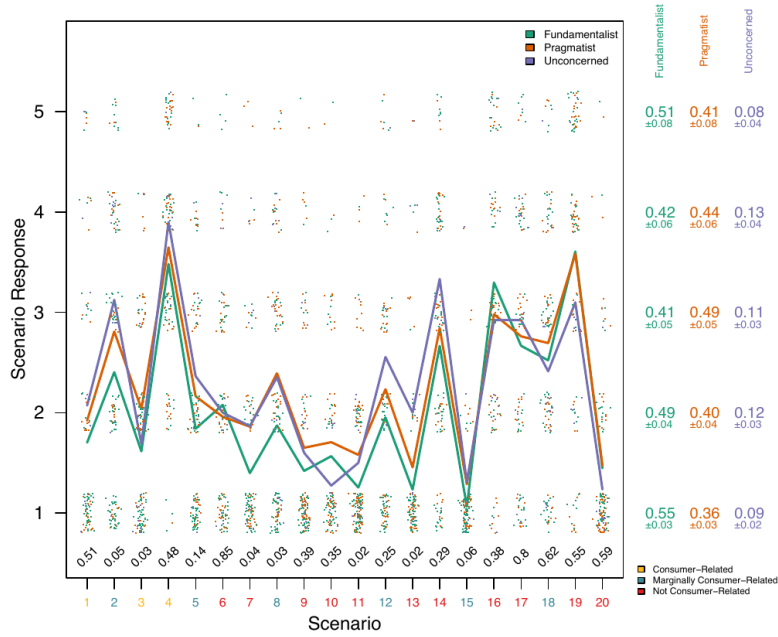
12. A national newspaper starts publishing an online map that shows all political donations made by individuals. Anyone can search the map by name or address to see which causes an individual donated to, and how much. Many people start using it to look up donations made by people they know. You want to donate money to your favorite political candidate, but many of the people you know aren't aware that you support him.
- Many of your friends see that you donated money, and they are inspired to donate to the candidate you support as well. The candidate you support wins the election, in part because of supporters like yourself and your friends.
  - Your boss finds out about your political leanings, and you are passed over for a promotion. You are pretty sure it is because your boss is unsympathetic to your beliefs, but you can't prove it.
  - Your next door neighbors find out about your political leanings. You hadn't realized it, but they strongly support the opposing party and they had assumed you did as well. Now every time you see them, they try to change your mind about how you are going to vote. They are polite but extremely annoying.

## Distribution of Westin Categories

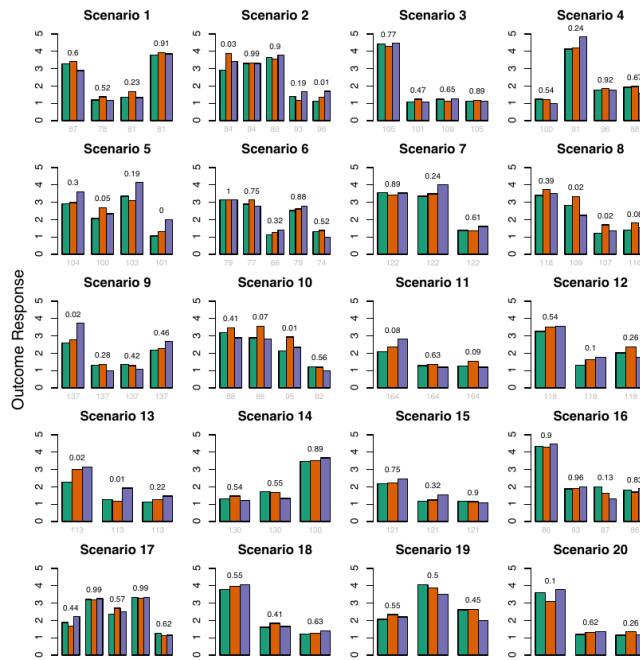
DataSet	Fundamentalist	Pragmatist	Unconcerned
MTurk '14	49%	40%	10%
GCS1 '14	38%	57%	6%
GCS2 '14	37%	58%	5%
Harris-Westin '03	26%	64%	10%
Harris-Westin '01	34%	58%	8%



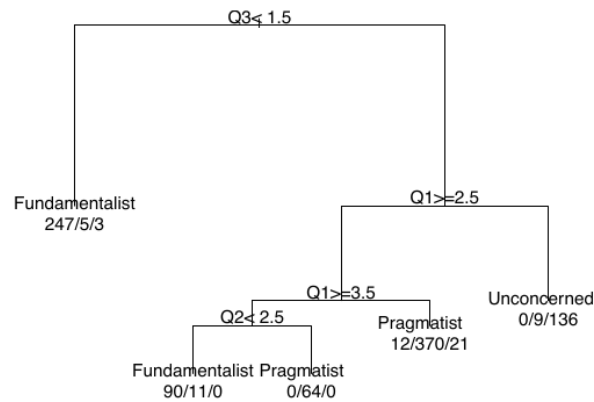
# Westin Categories vs Scenario Response



# Scenario Outcome Analysis



## New Westin Clusters



1. Privacy Fundamentalist: 'Strongly Disagree' on Q3 OR ('Strongly Agree' on Q1 and 'Strongly Disagree' or 'Somewhat Disagree' on Q2);
2. Privacy Unconcerned: Q3 is not 'Strongly Disagree' AND ('Strongly Disagree' or 'Somewhat Disagree' on Q1);
3. Privacy Pragmatist: All other participants.

## Brand Manipulations

	Visa	Walmart	Safeway	PayPal	Amazon
Q1: Loss of Control	-0.21 ± 0.081	-0.30 ± 0.080	-0.35 ± 0.081	-0.44 ± 0.080	-0.50 ± 0.080
Q2: Businesses Behave Well	0.12 ± 0.075	0.00 ± 0.075	0.07 ± 0.075	0.26 ± 0.075	0.33 ± 0.075
Q3: Laws Protect	0.20 ± 0.078	0.11 ± 0.078	0.18 ± 0.078	0.32 ± 0.078	0.40 ± 0.078

- Understand whether making Westin questions more specific has an effect
- Survey with 6000 participants
- Numbers show variation from original Westin responses
- 18% fundamentalist and 25% unconcerned for Amazon

## Implications

- Negative result for Westin: No evidence to demonstrate correlation between Westin categories and
  - Behavioral intentions
  - Responses to consequences
- Privacy segmentations (such as Westin's) reach the limit for predicting privacy choices across diverse real life privacy conditions

## Fitbit Activity in Search Results

- News article: <http://techcrunch.com/2011/07/03/sexual-activity-tracked-by-fitbit-shows-up-in-google-search-results/>
- Links are also on the course website

## Things to Look For

- Root cause: What went wrong?
  - If it was not intentional, what was the original aim?
  - Affected parties
  - Implications and similar problems
  - Mitigation (using methods we have seen): Prevention, detection, recovery
- 
- Take 10 minutes to look at the incident on your own
- 
- Now discuss with your neighbor
  - Also take a look at the summary report: <https://drive.google.com/file/d/0B3m-I0YVAv0EeIBUckJWTTfwQ0E/view?usp=sharing>