Designing Effective Web Sites
How Academic Research Influences Practice

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Basic Rules of Webpage Design and Layout

- Your website should be ...
  - easy to read
  - easy to navigate
  - easy to find
  - consistent in layout
  - quick to download

- *Is there more to it than this?*

- *Are there right vs wrong ways to design an interface?*

- *Usability (speed, accuracy, etc.) is one approach to assess... Are there others?*

Using Behavioral Theories to Inform Design

- Some prior and ongoing projects…
    - *Influencing impulse buying behavior*
    - *Influencing organizational / product quality perceptions*
    - *Influencing customer relationships*
    - *Personalizing the online experience*
    - *Detecting emotions of online users*
    - *Enhancing team performance*
    - *Designing emergency response dashboards*

Influencing impulse buying behavior

- A sudden and immediate purchase with <u>NO</u> pre-shopping intentions

- Three crucial conditions necessary for this behavior to occur:

    1. Need for a <u>highly</u> *affective* response
    2. With <u>minimal</u> *cognitive* deliberation
   3. Leading to *reactive behavior*

Research Design (1 of many studies)

- ## Laboratory experiment
  - 2 x 2 design

- ## 216 undergraduate students
  - Average age: 20.6 years
  - 50% male

- ## Manipulations
  - Mood Relevant Cues (e.g., visual appeal)
  - Task Relevant Cues (e.g., task focus features)

		Task-Relevant Cues	
		Low Quality	High Quality
Mood Relevant Cues	Low Quality	Interface v1	Interface v3
	High Quality	Interface v2	Interface v4

Low Quality Cues
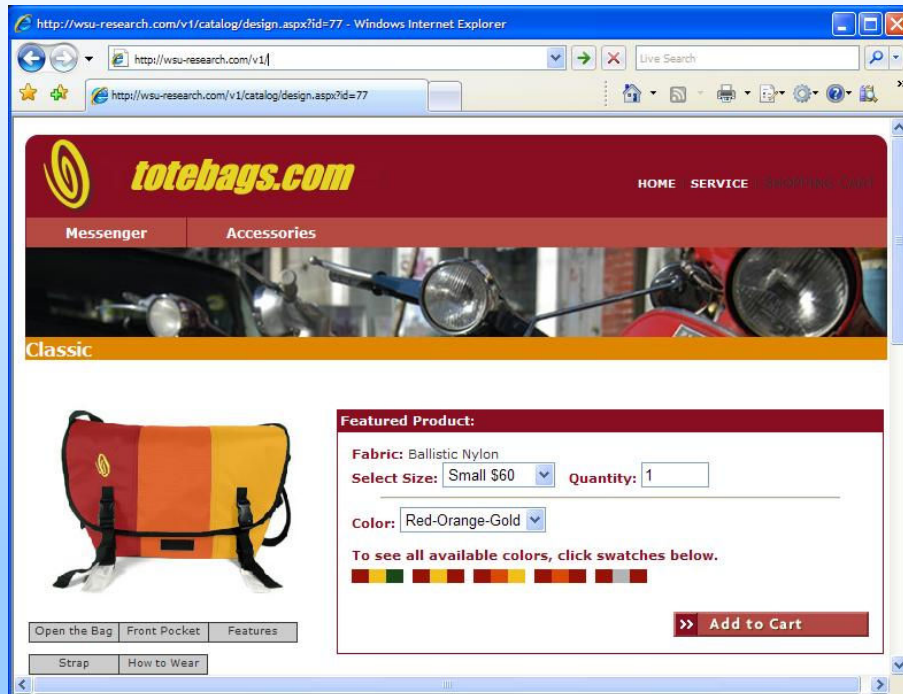
High Quality Cues

The Scenario

- Bob/Mary recently bought new cell-phone

- Purchase of cell-phone holster

  - Plans on spending no more than $15

  - But has enough to splurge a little

- Goes to website to check on holster

  - Sees new bag

  - Case for MP3/iPod device

Measuring Impulse Buying

- Five purchase decision alternatives
- From no → low → high impulsiveness

Non-Impulsive

Impulsive

(1) buying the cell-phone holster only;

(2) buying the holster only and wanting the new bag;

(3) buying the new bag instead of the holster;

(4) buying both the holster and the new bag; and

(5) buying the new bag, a matching holster and a MP3/iPod case.
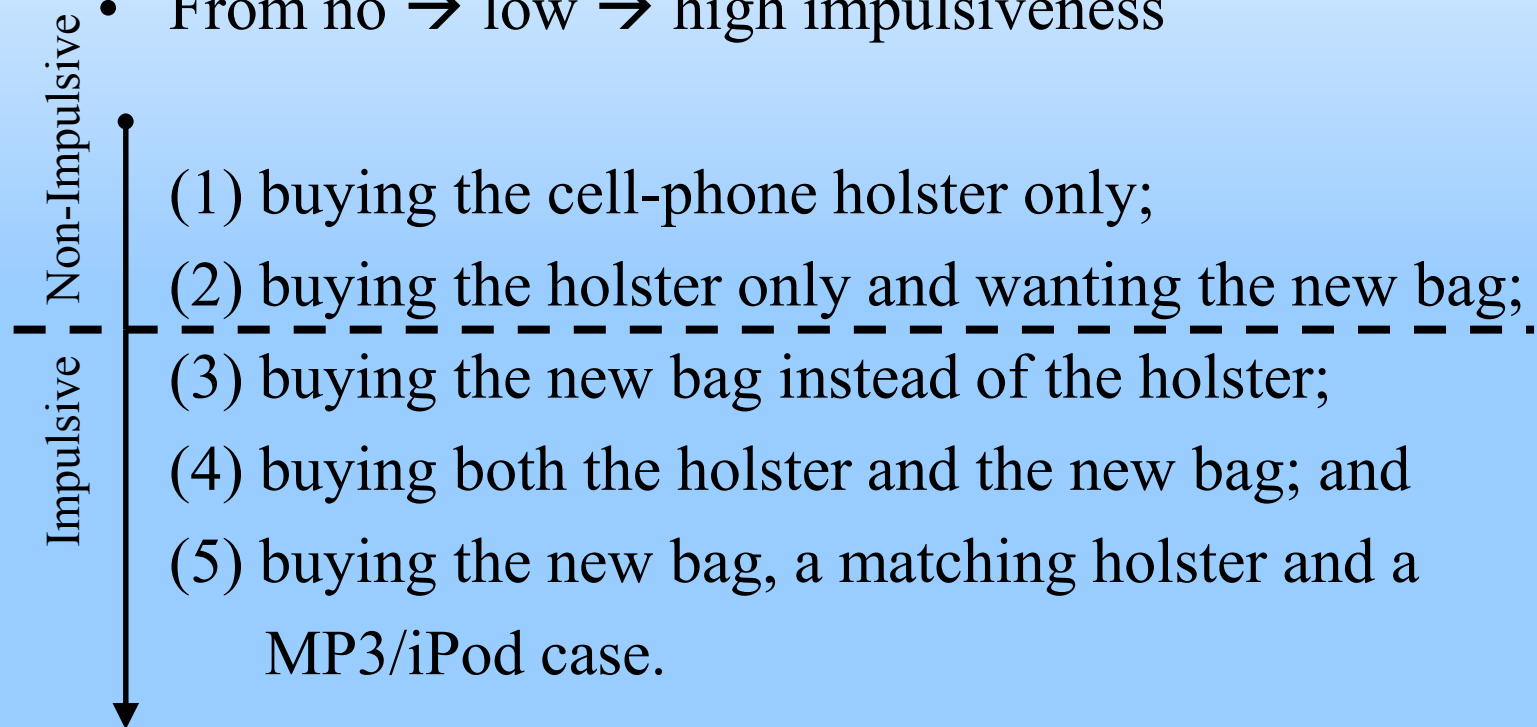
Subject's Impulsive and Non-Impulsive Purchases by Experimental Interface
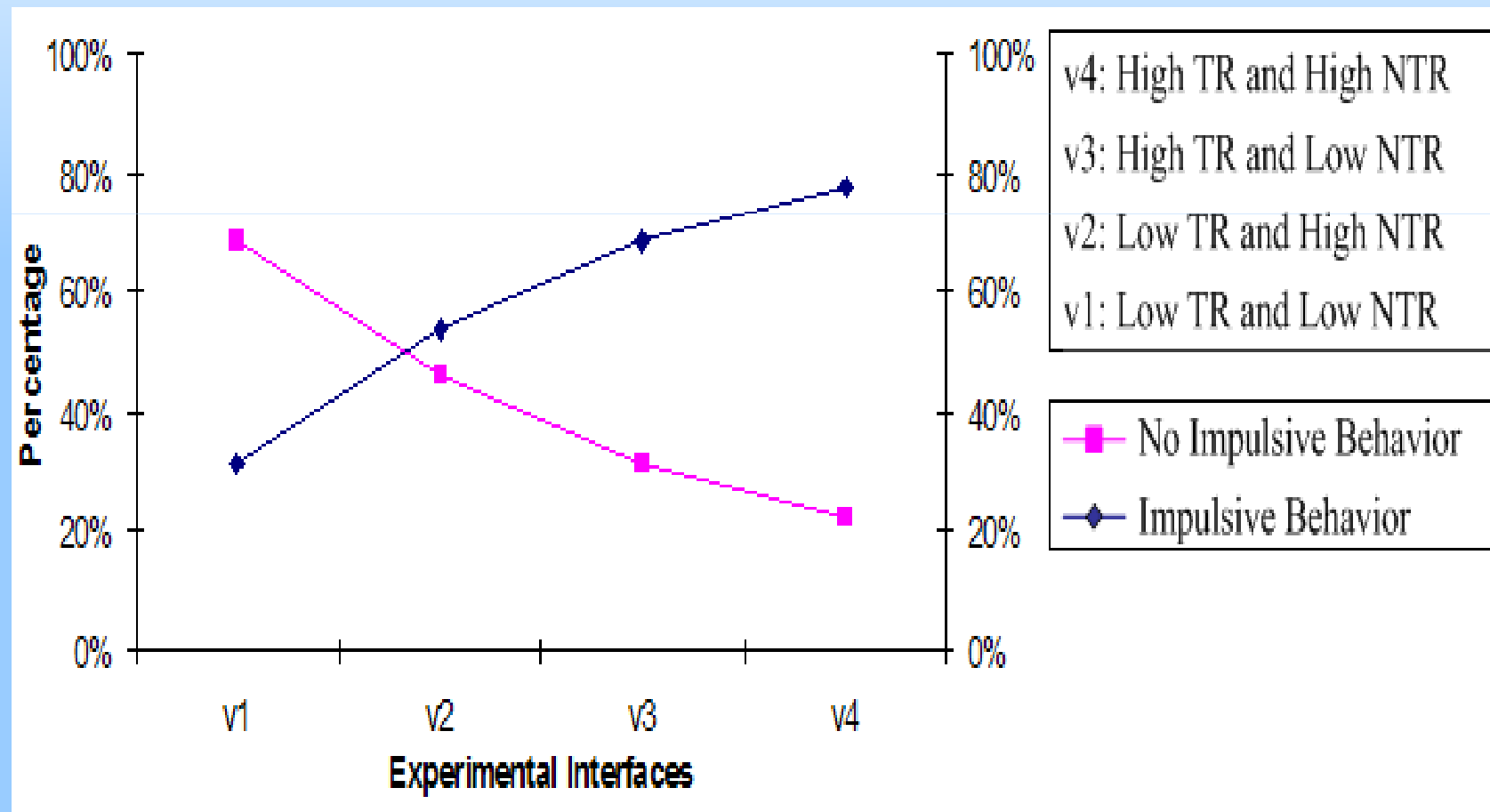
Impulsiveness Score and Average Purchase by Experimental Interface
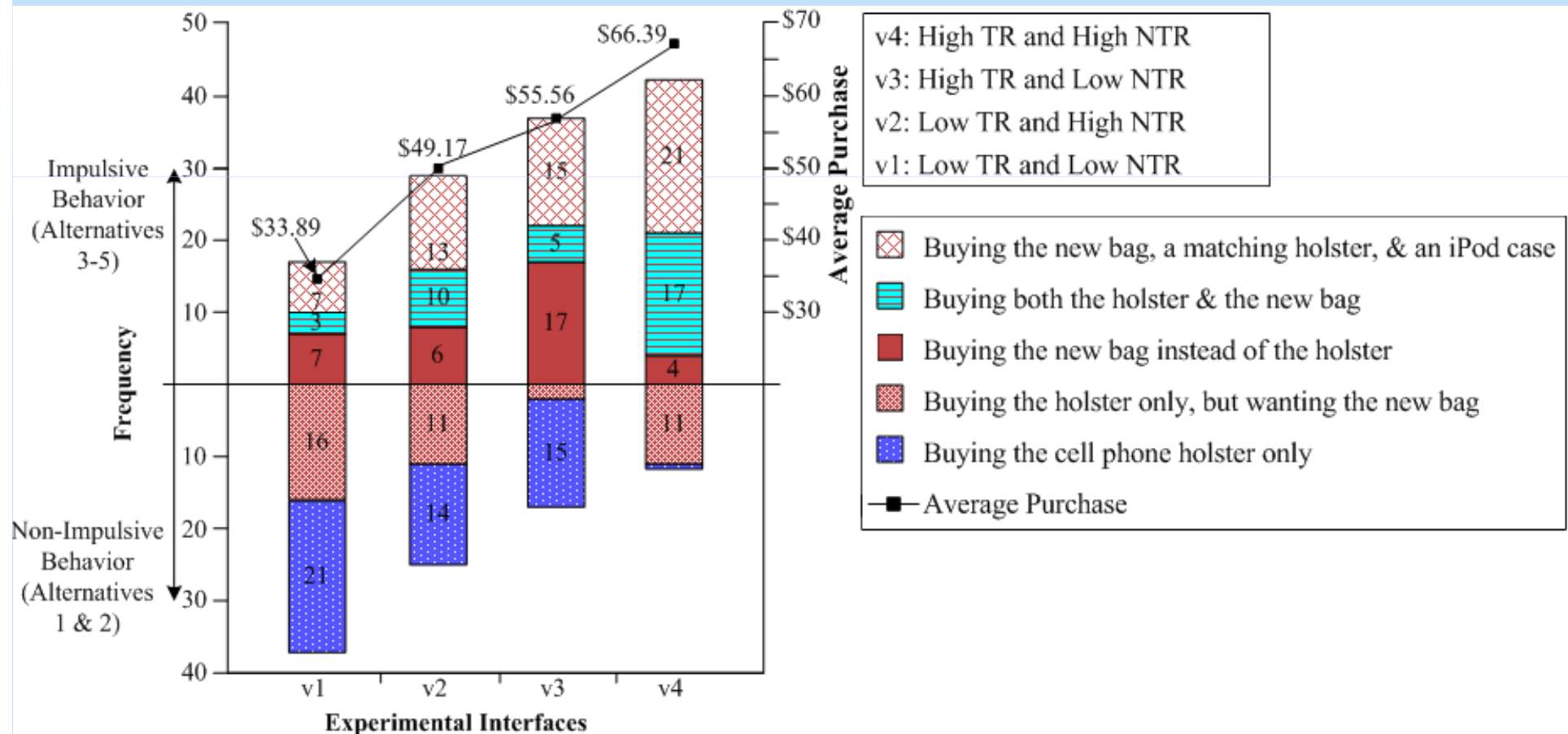
Related Publication

- Parboteeah, D.V., Valacich, J.S., & Wells, J.D. (2009) The Influence of Website Characteristics on a Consumer's Urge to Buy Impulsively. Information Systems Research, 20, 60-78.

- Wells, J.D., Parboteeah, D., and Valacich, J.S. (2011). Online Impulse Buying: Understanding the Interplay Between Consumer Impulsiveness and Website Quality. Journal of the Association for Information Systems, 12(1), Article 3.

Influencing organizational / product quality perceptions

- ## Intrinsic Cues
  - Product attributes that cannot be manipulated without also altering the physical properties of the product
  - Example: "How good is this costume material?"

- ## Extrinsic Cues
  - Product attributes that are not part of product (e.g., price, packaging)
  - Example: "This is a nice looking website!"
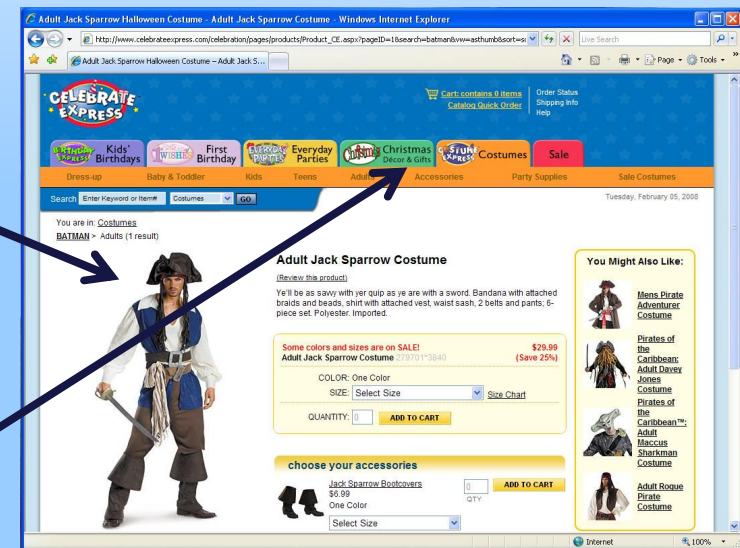
Influencing organizational / product quality perceptions

Simple Question: Which is the higher quality totebag?
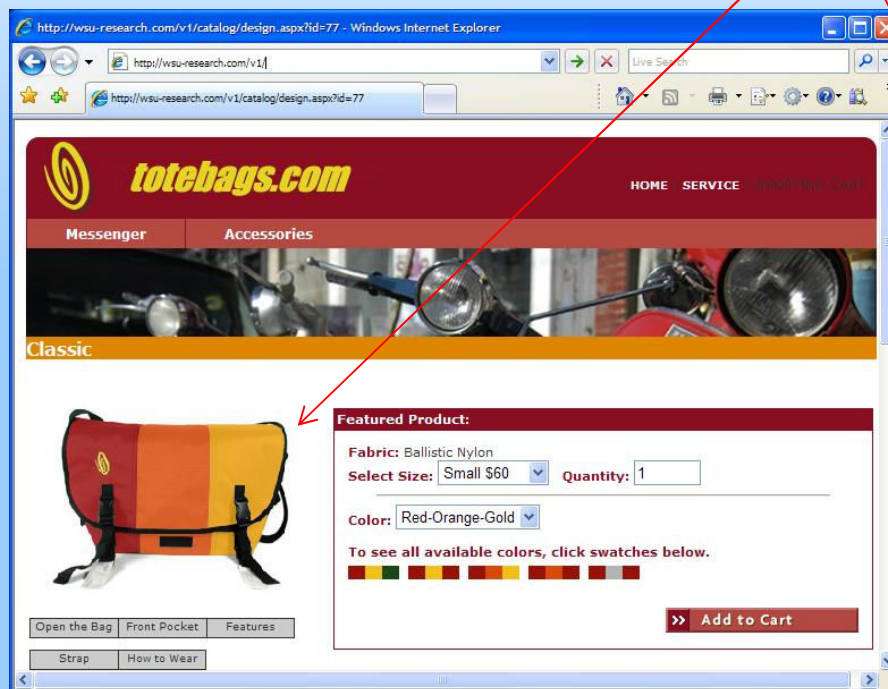
Examples of Intrinsic Vs. Extrinsic Cues

- Intrinsic include…
  - Material quality
  - Design
  - Size and weight
  - Fit of clothing
  - Taste / smell of meal
  - Quality of service
  - Etc…

- Extrinsic include…
  - Brand
  - Reputation
  - Price
  - Warranty
  - Packaging
  - Aesthetics
  - Etc…

When intrinsic product attributes are not readily available or when consumers are not confident in their ability to assess these attributes, _consumers will rely more on extrinsic product attributes._

Basic Experimental Design

Control the Intrinsic Cues (i.e., Product Characteristics)
Vary the Extrinsic Cues (i.e., Website Characteristics)
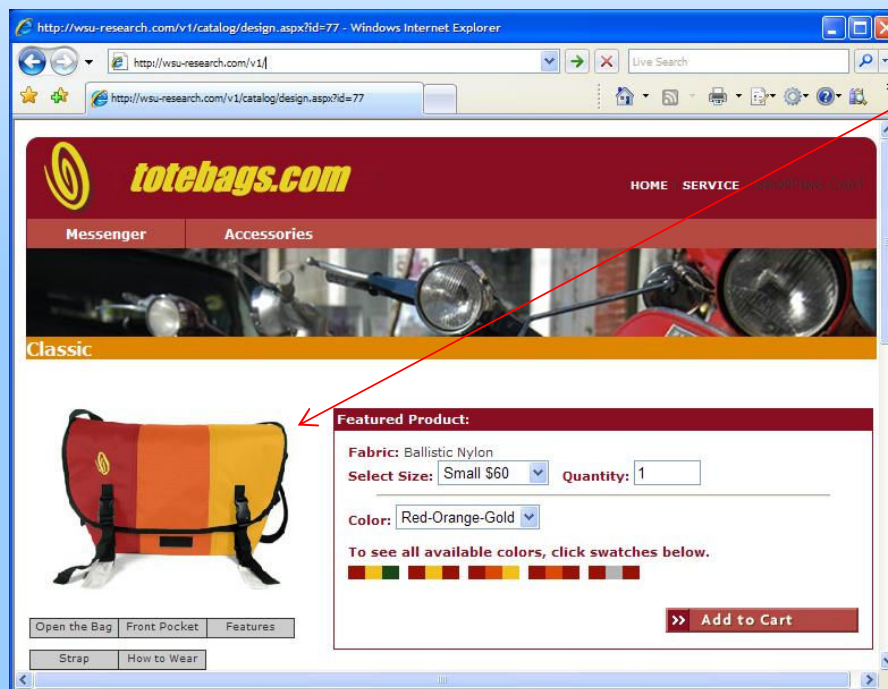
What the research shows...

- All organizational web sites send a signal to your customers

- Signals influence perceptions of organization quality and credibility
  - Good Website → Good Organization

- Perceived organization quality and credibility influence product perceptions
  - Good Organization → Good Products

- Perceived organization and product quality influence purchases
  - Good Organization, Products → Purchase!

Related Publication

- Wells, J.D., Valacich, J.S., & Hess, T. (2011). What Signal are you Sending? How Consumer-Facing Technology Influences Perceptions of Quality. MIS Quarterly, 35(2), 373-397.

Influencing customer relationships

- **Stage Theory (Levinger 1980)**
  - Attraction/Acquaintance
  - Build-Up
  - Continuation/Consolidation
  - Deterioration
  - Ending

- **EC Attraction** (prerequisite for other stages)
  - Initial Appeal
  - Stops at Intention
  - More than positive appraisal

- **Research Approach**
  - Translate specific aspects of the theory into interface design components

EC Attraction Model (eCAM)
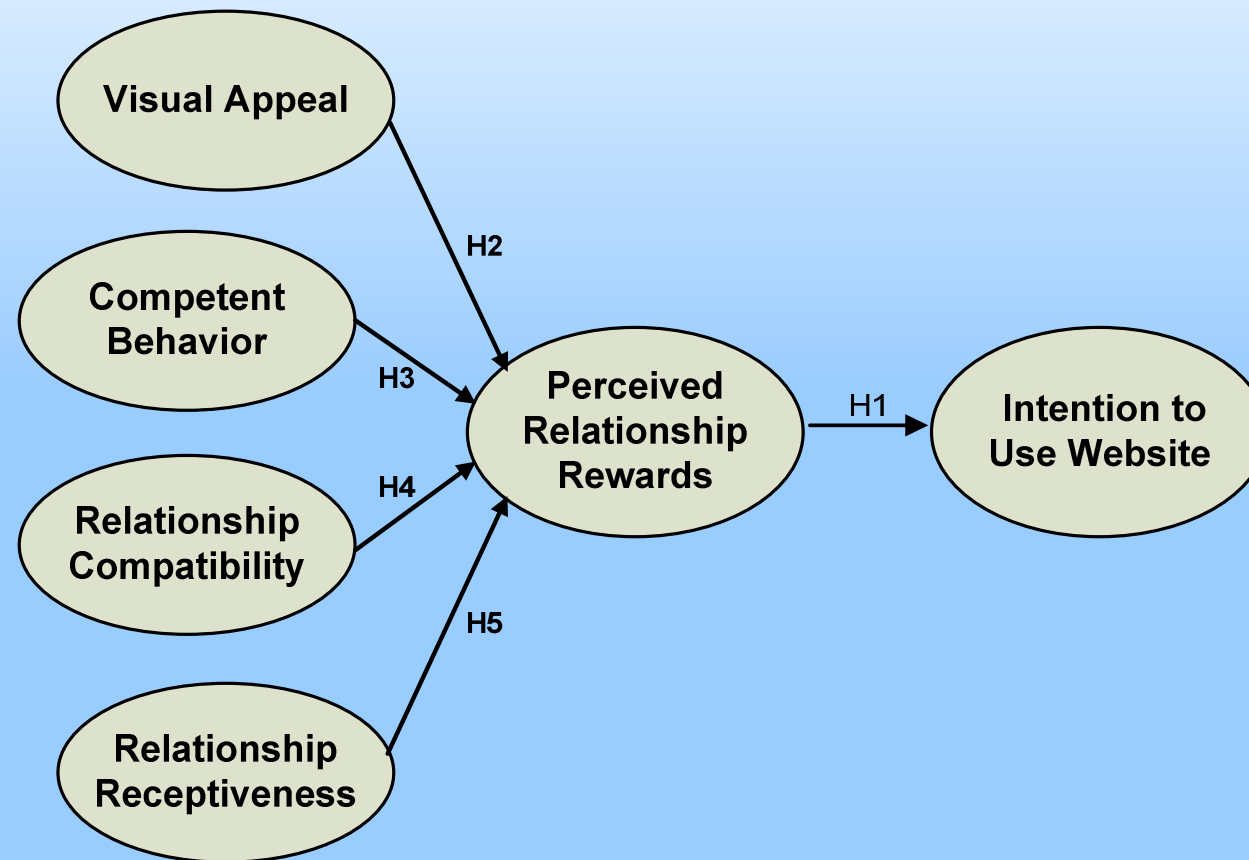
THE UNIVERSITY OF ARIZONA

PAC-10Tees.com

Home | All Tees | All Accessories | Service | Show Cart

Home

Welcome!
To The Best Custom Shirt Site Ever.
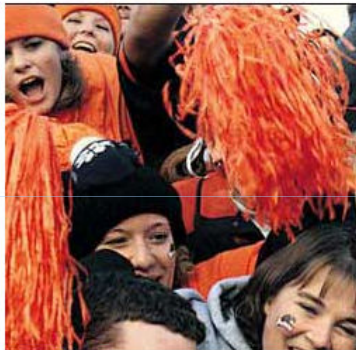
Featured Items

Add Custom Slogan

Customize your T-shirt further by adding a Slogan. [more]

Item# 216
$3.99

White T-Shirt

Here is your basic custom T-Shirt with your favorite PAC-10 match-up. [more]

Item# 012
$17.99

Categories

- All Shirts
- Accessories

[For category descriptions, click here]

PAC-10 Tees.com

Home | All Tees | All Accessories | Service | Show Cart

Home

Welcome!
To The Best Custom Shirt Site Ever.

Featured Items

UW vs WSU
November 12, 2006

EXAMPLE

White T-Shirt
$17.99

Categories

- All Shirts
- Accessories

[For category descriptions, click here]

eCAM Results

- We were able to increase attraction, and downstream adoption by modifying the web interface

- Strong support for website personalization based on relationship stage

- Stage Theory works in this context as well!
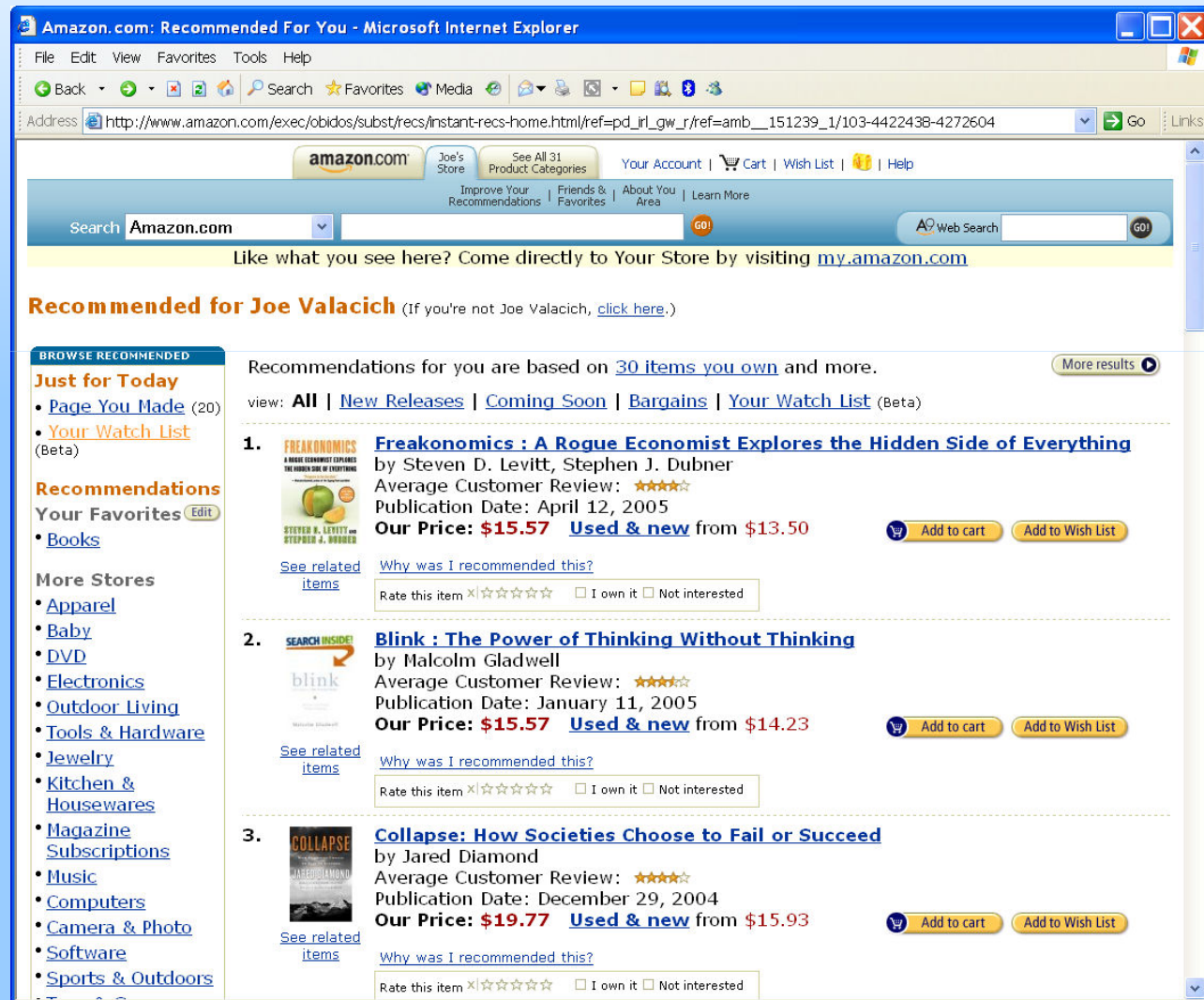
Related Publication

- Campbell, D.E., Wells, J.D., & Valacich, J.S. (in press). Breaking the Ice in B2C Relationships: Understanding Initial Perceptions of Websites with the eCommerce Attraction Model. Information Systems Research.

- Campbell D.E, J.D. Wells, and J.S. Valacich (2009) "Diagnosing and Managing Online Business-to-Consumer (B2C) Relationships: Toward an eCommerce B2C Relationship Stage Theory," AIS Transactions on Human-Computer Interaction, (1) 4, pp. 108-132.

Personalizing the online experience

- Web interfaces have often suffered from the inability to satisfy the multiplicity of users' needs.

- Different users come to the same site and are performing a different task.

- Companies such as Amazon, eBay, and Google employ technology to customize web content based on **past behavior**.

Personalization 1.0

Personalization 2.0

- Goal: Real-time, *dynamic tailoring* of web interfaces to meet the *unique needs* of *each customer*, *each time* they visit a website.
- Challenge: How do we make sure we personalize correctly?

Different Websites with Different Purposes

- When visiting a website, consumers are performing a task

- Tasks can be organized along a continuum

  - Goal-directed task (i.e., utilitarian)
    - Fast, clear, efficient…
  - Experiential task (i.e., hedonic)
    - Experiential, entertaining, and gratifying to the senses…
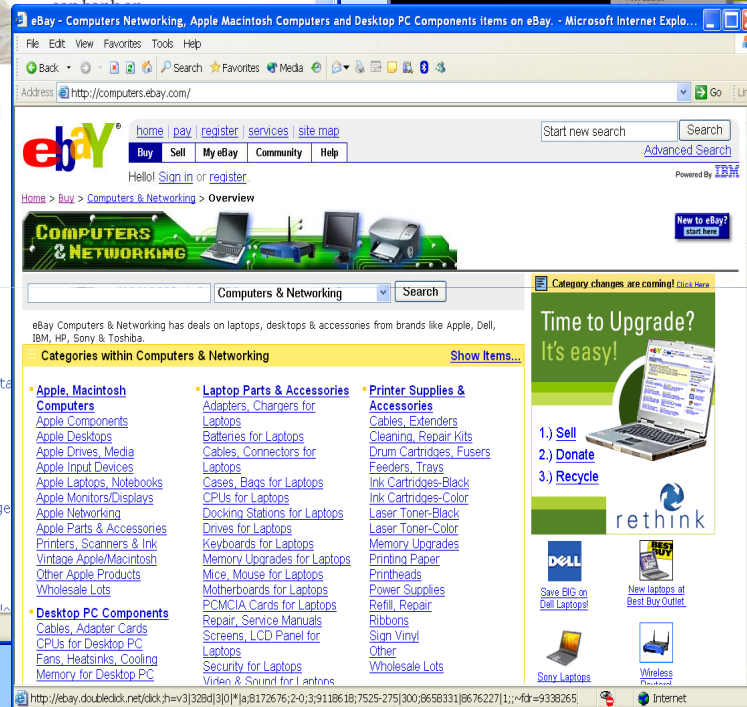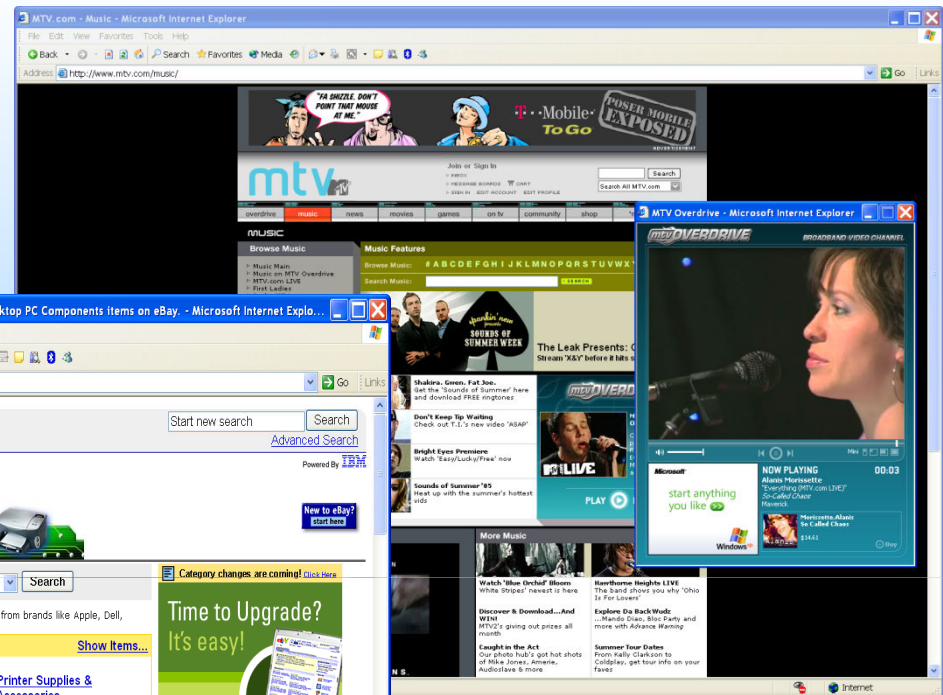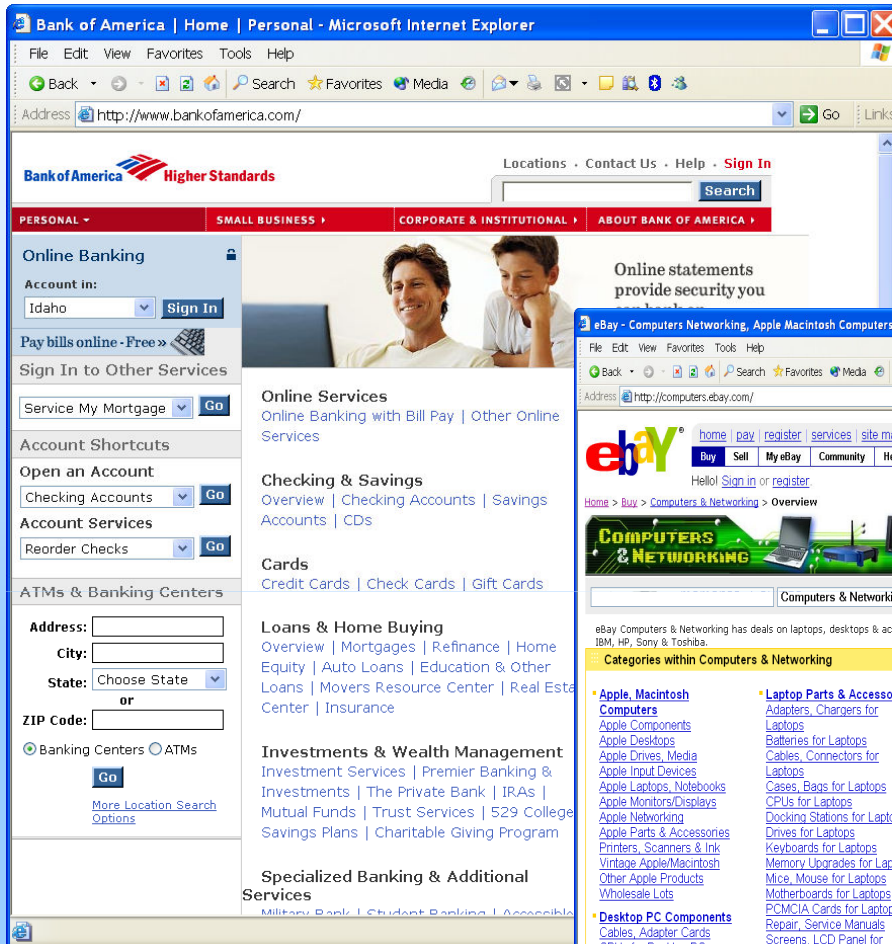
utilitarian ←———————————→ hedonic

hybrid

Motivation

- Two general categories…

  – Intrinsic – pleasure and inherent satisfaction derived from the activity
  – Extrinsic – performing a behavior because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity

- *Challenge: How to conceptualize motivational mechanisms into the HCI?*

Examples of certain motivations

Motivation ←————————————————————————————→

Extrinsic

Intrinsic

Paying a bill Online

Finding Concerts tickets for you and your friend

Finding new music Online

Submitting Homework

Downloading a tax form

Posting to a Blog

Viewing others Facebook page

Send an email to your boss

Perceived Locus of Causality

External	Somewhat External	External / Internal	Somewhat Internal	Internal

Online Consumer Motivation

Online Consumer Motivation

Experiential Web Site

Hybrid Web Site

Search Web Site

Search Task

You and a friend want to go to the Apple Cup in Seattle. Tickets have gone on sale this week and the game is very close to selling out.

Your friend has tasked you with buying tickets for the game. They have a couple of constraints though. They are as follows:
1 – You need 2 tickets.
2 – Anywhere on the North Side of the field.
3 – As close to the 50 yard line as possible.
4 – You have a total budget of $60 ($30 / ticket).

20 Sets of Tickets with 65 total tickets left

Experiential Task

You and a friend have been talking about going to the Apple Cup in Seattle. Tickets have gone on sale this week. You have offered to check out seating possibilities for the game and report back to him.

- Take your time and browse around the website and see what is available and interesting.

- Make sure you check out all the options (location, price, available tickets etc..) as you'll be asked for your recommendation by your friends after you browse the website. You can take notes if need be.

20 Sets of Tickets with 65 total tickets left

Personalization 2.0

Key result: <u>Hybrid</u> interface was consistently <u>least effective</u>. Matching task / personality led to best performance.
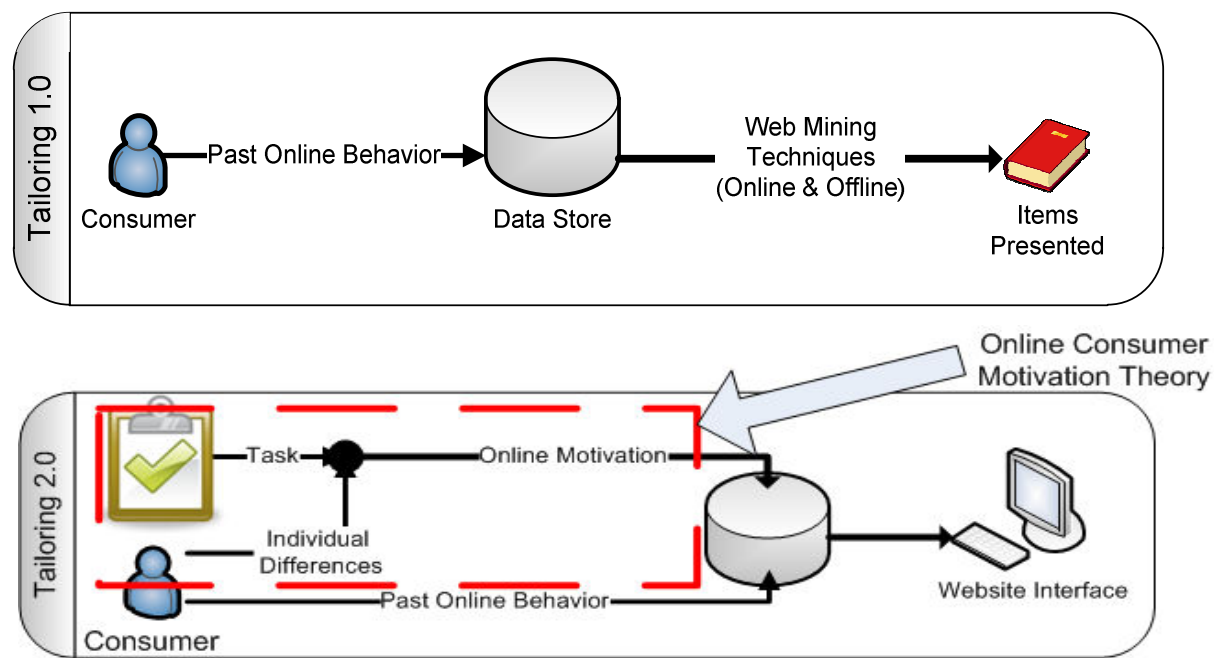
Related Publication

- Wright, R.W., Valacich, J.S., & Wells, J.W. (working paper). Online Consumer Motivation: A Task-Technology Fit Perspective. Target: <u>MIS Quarterly</u>.

Detecting emotions of online users

- Improved customer service → loyal customers, profits, other good outcomes
- Go beyond "looking backwards" via data mining and web analytics to enhance *future* interaction (web design)
- Understand exactly when a customer is upset or frustrated
- Preform "service intervention" in real-time

Emotion and Mouse Usage

- Emotion can be many types: happy, sad, anger, frustration, etc.

- Raised emotion results in observable motor reactions / changes

- Mouse and keyboard usage changes

  - Establish baselines

  - Observe changes from baselines

  - Understand context of interaction

  - Predict the type of emotion

Experimental Tasks: Configure Computers and Automobiles

Research Design

- Students in HK and Germany
- Repeated measurement of task / emotion survey approaches
- E.g., SAM
  - Self-Assessment Manikin
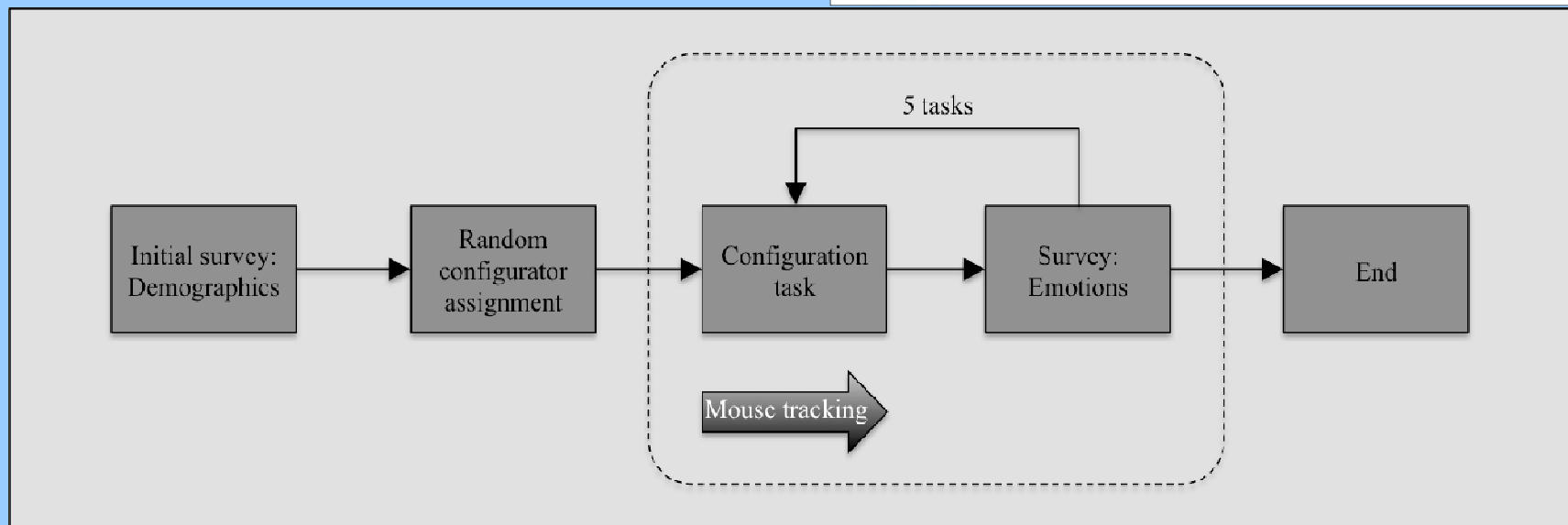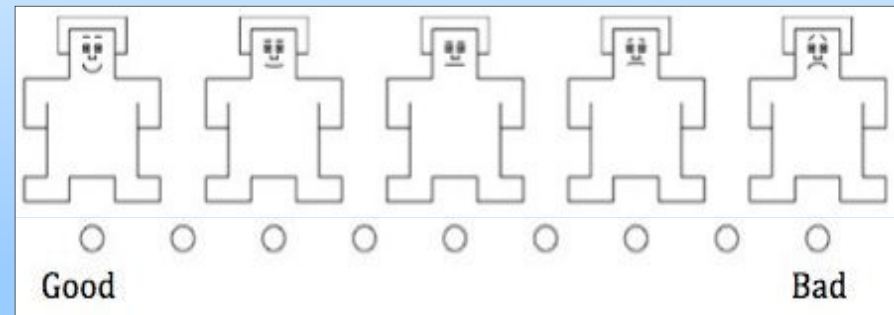
Results and Implications

- Changes in mouse movement is highly predictive of emotional changes

- Can be measured in real-time when service event is occurring

- Provides opportunity for *proactive* service intervention

- Many applications: e-commerce, web chat customer service, etc.

- Low cost approach for studying various NeuroIS phenomena

Related Publication

- Weinmann, M., Schneider, C., Hibbein, M. Valacich. J., & Robra-Bissantz, S. (under 1st review). From service failures to service recovery: Measuring online consumers' emotions during e-commerce transactions. <u>MIS Quarterly</u>.

Enhancing team performance

- ## Motivational Affordance
  - System properties that fulfill users' motivational needs
  - In a short term setting (such as group idea generation), the design principles focusing on _cognitive motivational needs_—i.e., achievement and competence—appear to be most readily applicable

- *Challenge: How to instantiate aspects of achievement and competence into the design of the HCI?*

Instantiating the "Need for Achievement" into the HCI

- **Providing feedback**
  - Allows a person to excel as compared to a standard of excellence
  - Allows a form of competition with one's self, or against others

- **Critical in the "effort → performance → reward" linkage**

- **Creates a competitive atmosphere**
  - upward social comparisons
  - social facilitation

- **Corrects unfounded performance perceptions**

- **Combats social loafing**
  - Positive reinforcement for high performers
  - Negative reinforcement for low performers

Goal Setting as a Motivational Factor

- Goals can…
  - provide standards for self-evaluation
  - motivate people to exert effort
  - Demonstrate Competence

Combining Performance Feedback and Goal Setting

- Performance feedback aids in assessing progress toward the goal

- How should goals be specified?
  - "Do your best"
    - defined idiosyncratically
    - individuals give themselves the benefit of the doubt
  - Specific goals precondition better performance

HCI—Explicit Goal / Feedback

Current individual performances

Performance Goal

Results – Idea Quantity

Related Publication

- Jung, J.H., Schneider, C., & Valacich, J.S. (2010). Enhancing the Motivational Affordance of Group Collaboration Environments: The Effects of Real-Time Performance Feedback and Goal Setting. <u>Management Science</u>, 56(4), 724-742.

Design of Emergency Response Dashboards

- Utilize various theories to understand how to better support decision making in *high velocity* environments
  - Time pressure, cognitive fit theory, etc.
  - Visualization theory, color theory, cue summation theory, etc.

Related Publication

- Ladd, D.A., & Valacich, J.S. (working paper). Do DSSs Bounce? Shattering DSS Decision Quality with Task-Technology *Mis*fit. Target: <u>Information Systems Research</u>.

- McNab, A.L., Hess, T.J., & Valacich, J. S. (2011). Designing Emergency Response Dispatch Systems for Better Dispatcher Performance. <u>AIS Transactions on Human-Computer Interaction</u>, 3(1), 26-54.

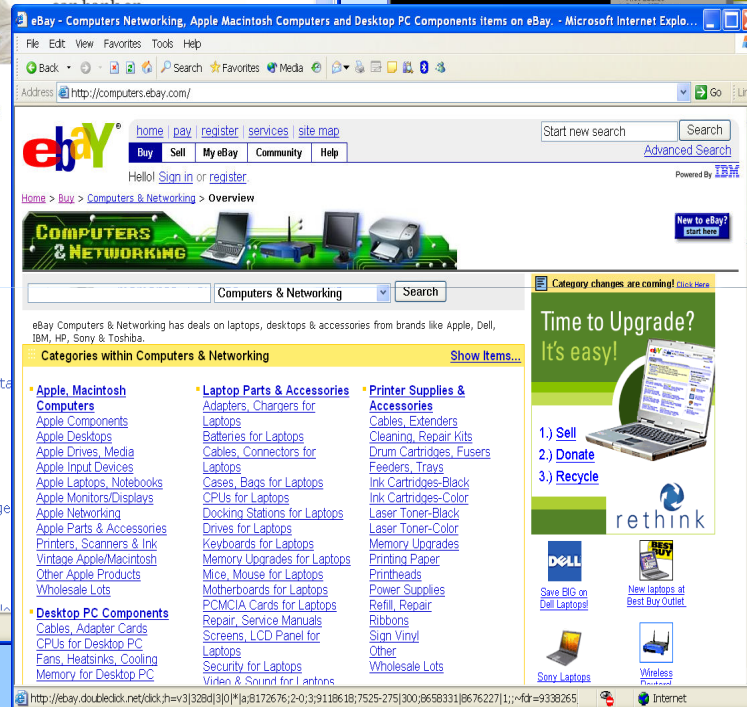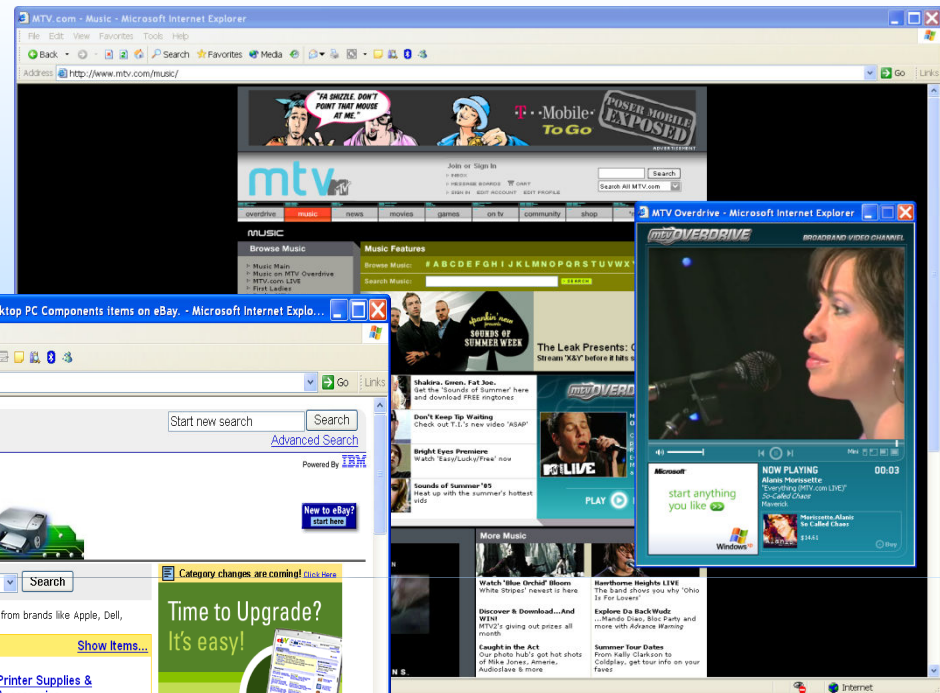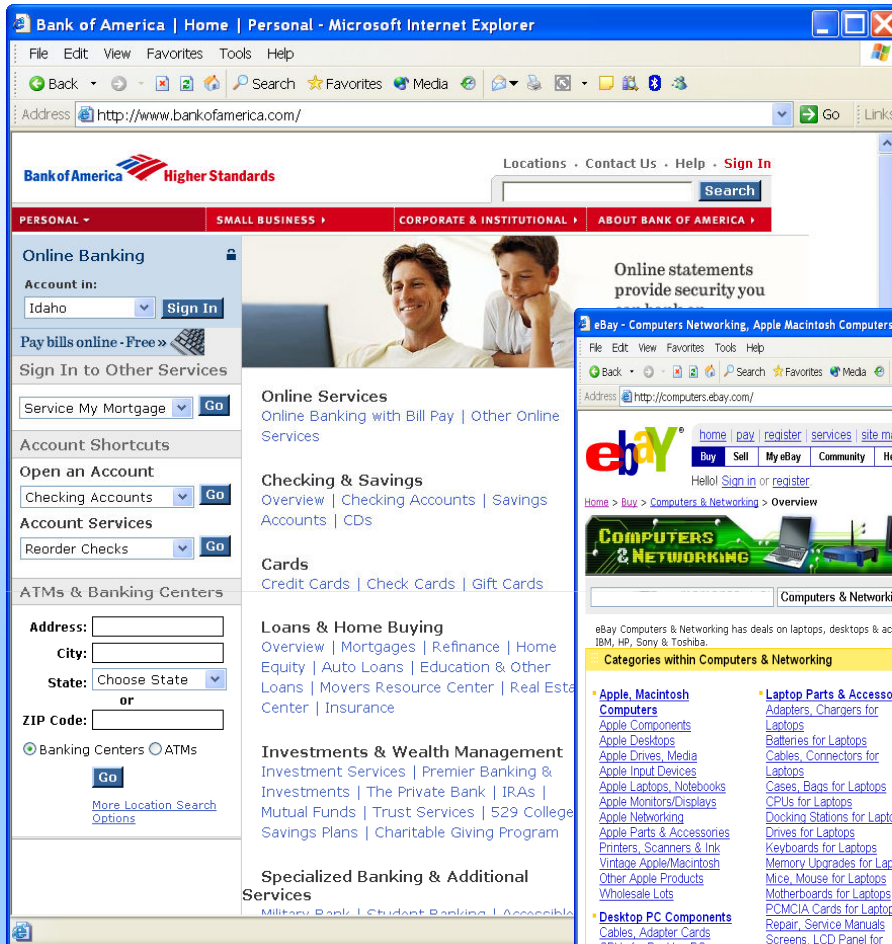# ONLINE CONSUMER'S HIERARCHY OF NEEDS

PROVIDING GUIDANCE TO DESIGN

Valacich, J.S., Parboteeah, D.V., & Wells, J.D. (2007). Not All Interface Characteristics are Created Equal: The Online Consumer's Hierarchy of Needs. Communications of the ACM, 50(9), 84-90.

Many Sites Have Multiple Types of Pages

utilitarian ← → hedonic

hybrid

Examples of Utilitarian, Hybrid and Hedonic Websites

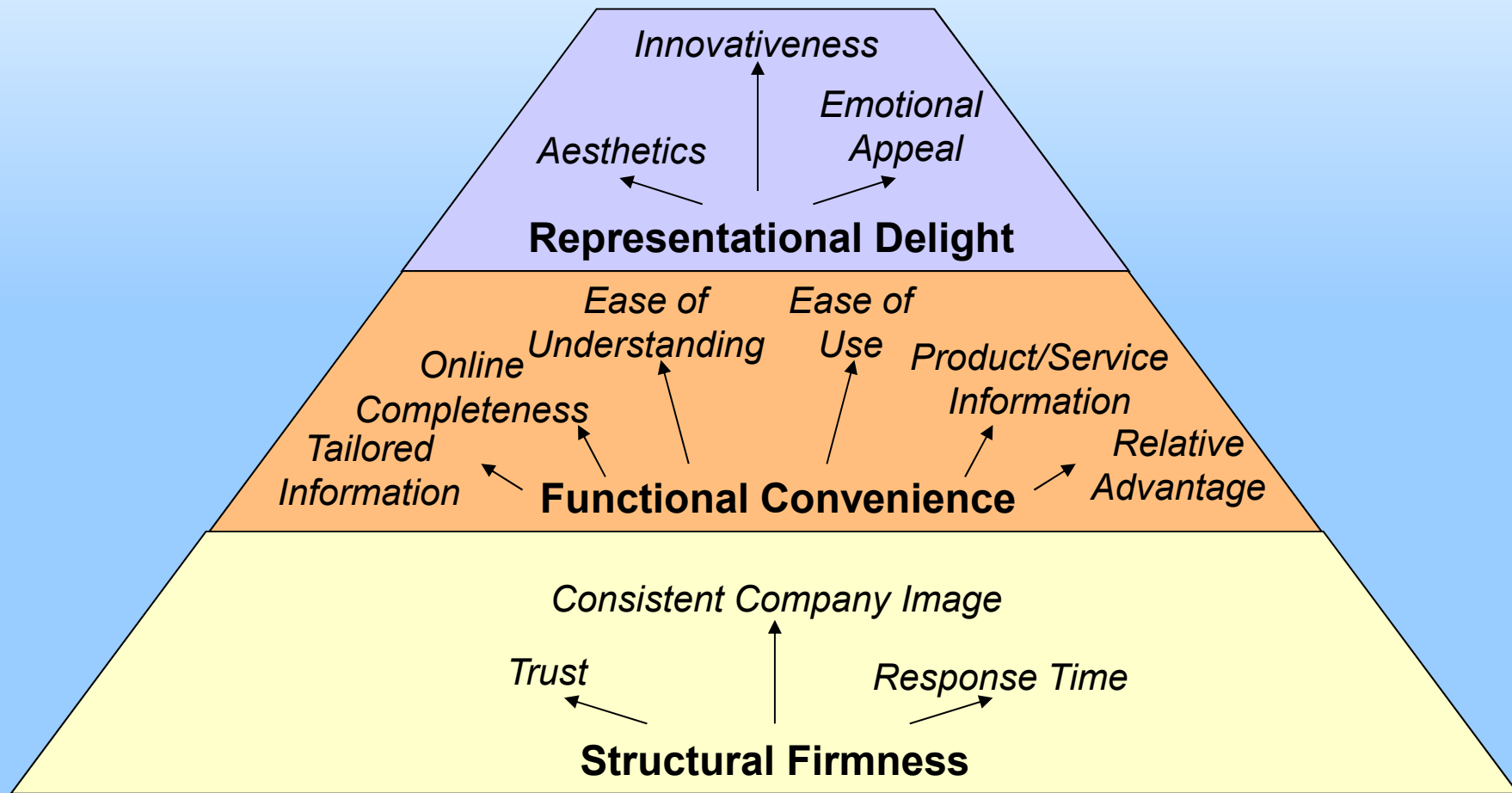| Utilitarian Websites	Hybrid Websites	Hedonic Websites
- **Banking sites, e.g., www.bankofamerica.com** - **Bill paying sites, e.g., www.verizon.com** - **Travel sites, e.g., www.travelocity.com**	- **News sites, e.g., www.seattletimes.com** - **Comparison sites, e.g., www.cnet.com** - **Shopping sites, e.g., www.amazon.com** - **Auctioning sites, e.g., www.ebay.com**	- **Music sites, e.g., www.mtv.com** - **Movie sites, e.g., www.movies.com** - **Games sites, e.g., www.shochwave.com** - **Gambling sites, e.g., www.flamingoclub.com** - **Celebrity sites, e.g., www.justinbiebermusic.com**

Implications for Design…

- Website Designers Can Deploy Many Interface Characteristics
  - E.g., sound, animation, graphics, etc.

- How do you decide what features to include on your website?

Categorizing Interface Characteristics

- Representational Delight
  - Features stimulate a consumer's senses.
  - E.g., interface design, layout, graphics, etc.

- Functional Convenience
  - Features that help the consumer's interaction.
  - E.g., ease of use, ease of navigation, etc.

- Structural Firmness
  - Features to assure security and performance.
  - E.g., response time, privacy policies, etc.

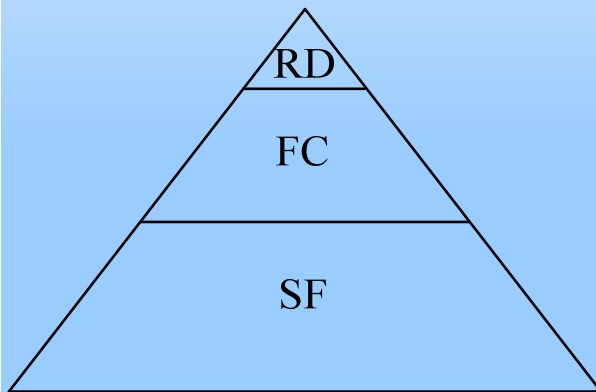# Online Consumer's Hierarchy of Needs

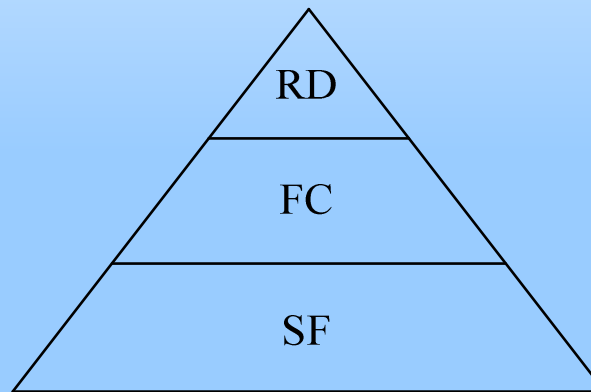# Different Websites (Pages) Must Focus on Different Design Features
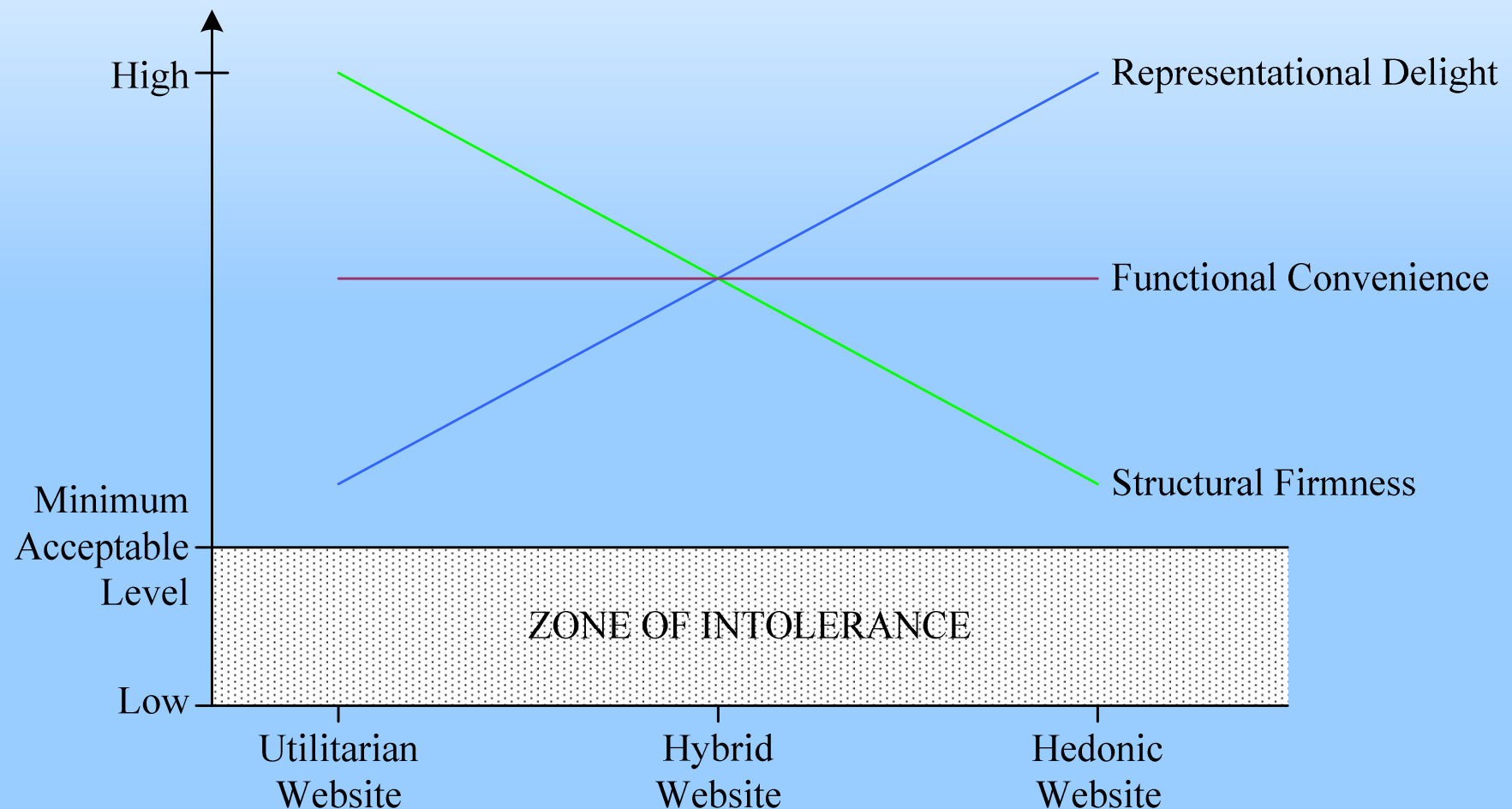
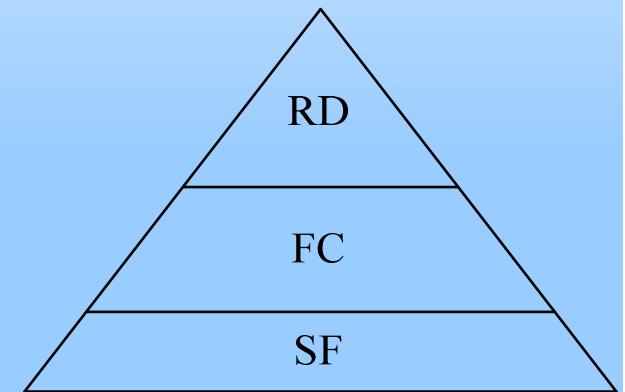# How to Allocate Design Resources for Different Types of Websites (Pages)

Utilitarian Websites

Hybrid Websites

Hedonic Websites

Key
Width of layers signifies relative focus of design resources.
RD = Representational Delight; FC = Functional Convenience; SF = Structural Firmness.

Conclusions

- There is more to design than making it look nice!

- Must understand why user is there / what they are doing

- Leverage theory to guide design (with testing)

- Insights gained from one context can be applied to countless system environments

Thanks!