

# Web Credibility and Persuasive Technology

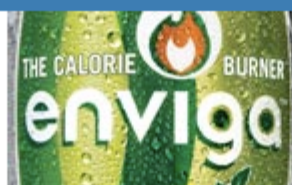
With some slides by Hien Nguyen

# Aside...

- In the HCI course, we are primarily concerned with ensuring the *usability* of an interface, e.g. a website:
  - How to design for usability
  - How to evaluate usability
- This lecture is about the different concept of *credibility*
- We will see how they are connected...

If you needed some information on health related topics,

Which of the following sites would you choose? And Why?



See for yourself how Enviga measures up.

ROLLOVER to see the comparison chart

Living Guide ▾

AOL health

In partnership with WebMD

Search the Web:

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You are here: Health

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## "The Secret": Is It the Real Deal?



If you want it, if you think about it, it can be yours; according to this hot self-help best seller. But is this theory based in fact or fiction? Can you really think yourself into a better life?

- Find Out What the Experts Say

## Happy Thoughts

Do you believe in positive thinking?

- ☐ Yes, focusing on what I want helps me succeed
- ☐ No, I haven't seen strong evidence that it works
- ☐ Maybe, and what's the harm?

Vote

## Health News

- Watchdog Group Calls for Celebrex Ad Pull
- Herpes Hit Horses at Site of Beijing Olympics
- Mystery Illness Hits Hundreds of School Kids
- China Issues New Rules on Transplants
- Risky Teen Behavior May Be All in the Brain

More Health Headlines



## Healthy Spring

Want to feel and look your best this spring?

Find out how to have fun and stay healthy and well.

- Seasonal Fruits and Veggies

## Top 11

Presented by

Lunesta

Drugs | Conditions | Tools

Popular Conditions

1. ADD/ADHD
2. Arthritis
3. Depression
4. Fibromyalgia
5. Gout
6. Heart Disease
7. Herpes
8. Lupus
9. Menopause
10. Multiple Sclerosis
11. Shingles



Featuring  
**HARVARD MEDICAL  
SCHOOL'S**  
Consumer Health Information

04/10/07

Enter A Drug Name  
 [Search](#)

Enter A Search Term  
 [Search](#)

Home	Diseases & Conditions	Healthy Lifestyle	Your Health	Look It Up
<a href="#">Health Commentaries</a>	<ul style="list-style-type: none"><li>• Addiction</li><li>• Allergy</li><li>• Alzheimer's Disease</li><li>• Anemia</li><li>• Arthritis</li><li>• Asthma</li></ul>	<ul style="list-style-type: none"><li>• Complementary &amp; Alternative Medicine</li><li>• Fitness</li><li>• Nutrition</li><li>• Weight Management</li><li>• Workplace Health</li></ul>	<ul style="list-style-type: none"><li>• Children's Health</li><li>• Men's Health</li><li>• Seniors' Health</li><li>• Women's Health</li><li>• More</li></ul>	<ul style="list-style-type: none"><li>• Medical Dictionary</li><li>• Diseases and Conditions</li><li>• Drug Resource Center</li><li>• More</li></ul>
<a href="#">Dental Health</a>				
<a href="#">Drug Resource Center</a>				
<a href="#">Ask The Expert</a>				
<a href="#">Interactive Tools</a>				
<a href="#">Today's News</a>				
<a href="#">InteliHealth Policies</a>				
<a href="#">Site Map</a>				



### Spring Health Hints

Whether the temperature is 40 or 70, it's spring. Sports have started and pollen proliferates. Learn to [keep your kids safe](#), your [allergies](#) tamed and more in our [Spring Health Insight](#).

HARVARD MEDICAL SCHOOL COMMENTARY:  
Cancer Update: Two Studies Worth Heeding

[Full Commentary](#)    [More Commentaries](#)

### News Review From Harvard Medical School

Trusted Harvard Medical School experts put today's health news stories in perspective and explain how issues affect you.

[Search Health Topics](#)

Check out **FREE Health**  
**our E-MAILS >>**

Genetic Testing	Simple Steps To Better Dental Health®	
Our guide features articles, illustrations, videos and an <b>interactive decision tool</b> .	Comprehensive Oral Health Information	
<b>Staying Well In Flu Season</b>	<b>Poll</b>	
Influenza causes about 36,000 U.S. deaths each year. Check our <u><a href="#">flu tracker</a></u> and find out more about <u><a href="#">flu</a></u> and <u><a href="#">bird flu</a></u> .	Q: If you ever had a breast MRI, what was the reason? • Routine screening test because of high risk of breast cancer • Follow-up to an abnormal mammoqram	

# Contents

1. What is credibility?
2. Why is credibility important in HCI?
3. What kinds of systems is credibility important for?
4. How is computer credibility gained, lost and regained?
5. What makes a website credible?
6. How to evaluate web credibility?

# What is Credibility?

- **Credibility = Believability**
- It is not a commodity that an object possesses, it is a **perceived quality**.
- It is perceived through multiple dimensions simultaneously.
- 2 key dimensions: **Trustworthiness** and **Expertise**
- *Trustworthy = good, truthful, well-intentioned, unbiased, honest.*
- *Expert = knowledgeable, competent, experienced, capable.*



# Four types of Credibility

## **1. Presumed Credibility**

General assumptions of the perceivers.

## **2. Surface Credibility**

Simple inspection of superficial characteristics.

## **3. Reputed Credibility**

Third-party endorsements, reports, awards or referrals.

## **4. Earned Credibility**

First-hand experience that extends over time.

(Fogg 2003)



# 1. Presumed Credibility

- “The extent to which a person believes someone or something because of general assumptions in the person’s mind”.
  - Salespeople are dishonest → don’t believe what they say
  - Doctors are medical experts → believe what they say about medicine.
  - “.org”, “.edu”, “.gov” sites are more credible than “.com” sites.
- Research has shown that *computers have high presumed credibility*.
  - Online newspapers are more credible than traditional counterparts.
  - Computers are perceived as being “faultless”, and having “superior wisdom”.

## 2. Surface Credibility

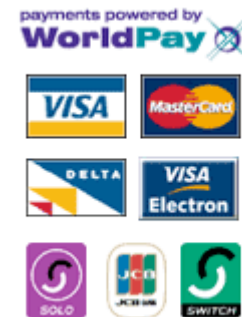
- “Initial judgement based on first impressions of surface traits”  
(e.g. a person’s looks, a system’s visual design).
- Very important considering:
  - The vast amount of websites that provide similar content.
  - 60% of traffic of a typical commercial website comes from search engines.
  - “Halo effect” = First impressions last.

People form first judgments about their like or dislike of a page within 1/20 of a second before they read it.

Journal of Behaviour and Information Technology

# 3. Reputed Credibility

- “The extent to which a person believes someone or something because of what third parties have reported”.
- Reports can be
  - Endorsements (e.g. a review from PC Magazine)
  - Awards (e.g. Webby, CNet Readers’ Choice)
  - Referrals (e.g. digg.com)
- The more credible the third party, the more credible its report.



# 4. Earned Credibility

- Based on “the experience with a source over time”.

Hence, it can be strengthened or damaged.

- Would you come back to websites that you have had good experiences with?
- Would you come back to a website if you found out its recommendations are based on commissions?

Credibility strengthens over time if computers perform consistently in accordance with the user's expectations

(Fogg, 2003)

- Most powerful and reliable form of credibility.

# Why is Credibility important for HCI?

From **the users'** point of view:

- Should I buy a product from this site?
- Should I believe the recommendations made by this site?
- There are too many deceptive sites out there.

*Credibility is a criteria to filter information*

From **the designers'** point of view:

- I want people to buy products from my site.
- I want people to follow my recommendations.

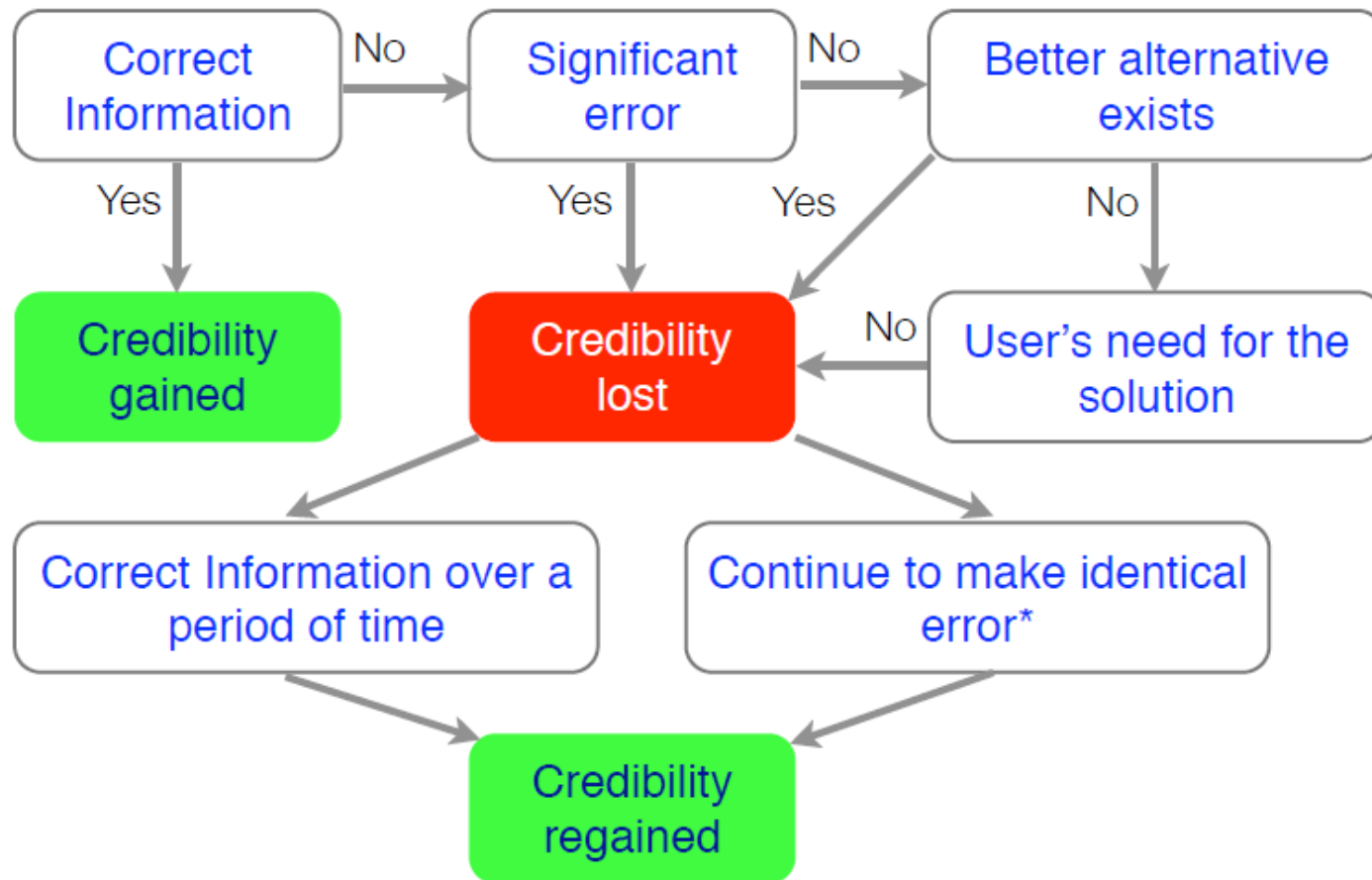
*Credibility enhances the impact of information  
on the users' knowledge, attitudes or behaviour.*

# What kinds of systems is Credibility important for?

Systems that:

- Sell goods or services
- Instruct or Advise users
- Report Measurements
- Provide information and analysis
- Report on work performed / their own state
- Run simulations / render virtual environments
- ..

# Dynamics of computer credibility



\* Error must be insignificant

# What makes a website credible?

- Many studies have been carried out and each suggests a set of factors influencing web credibility.
- E.g. two large-scale studies by Fogg suggest 7 factors:

Factors boosting credibility:

- 1 Real-World Feel
- 2 Ease of Use
- 3 Expertise
- 4 Trustworthiness
- 5 Message Tailoring

Larger  
Impact



Smaller  
Impact

Factors hurting credibility:

- 1 Commercial Implications
- 2 Amateurism

Fogg, 2003



# Real-World Feel

Items that boost credibility:

1. Provides quick responses to customer service questions.
2. Lists the organization's physical address.
3. Gives a contact phone number.
4. Gives a contact email address.
5. Shows photos of the organization's members.

## Contact Details

Unit A4  
Davidson House  
Campus 1  
Aberdeen Science Tech Park  
Balgownie Road  
Bridge of Don  
Aberdeen AB22 8GT

+44(0)1224 355255  
+44(0)1224 355256  
[info@perlgonsolutions.com](mailto:info@perlgonsolutions.com)



Choosing photos to show with care.  
Who do you want to learn from about:

1. Health benefits of exercise
2. Fitness programs



# Ease of Use

Items that boost credibility:

1. Lets you search past content.
2. Looks professionally designed.
3. Arranged in a way that makes sense to you.

Items that hurt credibility:

1. Takes a long time to download.
2. Difficult to navigate.

# Expertise

Items that boost credibility:

1. Is owned by an organisation that is well respected outside of the Internet.
2. Lists authors' credentials for each article.
3. Has articles that list references.
4. Has few news stories but gives detailed information for each.
5. Says it is the official site for a specific topic.
6. Has ratings or reviews of its content.
7. Displays an award, or seal of approval it has acquired



BBC  
NEWS



MANUTD.COM  
THE OFFICIAL WEBSITE  
FOR THE WORLD'S  
MOST POPULAR  
FOOTBALL TEAM



# Trustworthiness

Items that boost credibility:

1. Linked to by a site you think is believable.
2. States its policy on content.
3. Links to outside materials.
4. Links to its competitors sites.
5. Recommended to you by a friend.
6. Represents a nonprofit organisation.
7. Lists well-known corporate customers.
8. The URL for the site ends with “.org”.



Amazon.co.uk

Like this page?  
[Send it to a friend](#)





# Message Tailoring

Items that boost credibility:

1. Sends confirmation emails of your transactions.
2. Selects news stories according to your preferences.
3. Recognizes you have been there before.
4. Requires you to register or log in.

amazon.co.uk

Google<sup>TM</sup>  
News U.K.

# Commercial Implications

Items that boost credibility:



1. Is advertised on the radio or billboards.
2. Has ads that match the topic you are reading about.
3. Designed for e-commerce transactions.



Items that hurt credibility:

1. Has a commercial purpose.
2. Has one or more ads on each page.
3. Pops up new windows with ads.
4. Is hard to distinguish ads from content.



# Amateurism

Items that boost credibility:

1. Frequently updated.
2. Offer information in more than one language.

Items that hurt credibility:

1. Has very few pages.
2. Hosted by a third party (e.g. geocities).
3. Domain name does not match company's name.
4. Has typographical errors.
5. Is sometimes unexpectedly unavailable.
6. Has broken links or links to untrustworthy sites.

# Website credibility is complex

Many factors influence users' perception of credibility:

- **Situation:**

- Computers are more credible in unfamiliar situations.
- Computers are more credible after people failed to solve the problem themselves.
- Computers are more credible when people have a strong need for information.

- **Users' characteristics:**

- Familiarity with the topic.
- Culture.
- Individual differences.



# Evaluation:

## Three ways to assess credibility

### 1. Using self-reports

Asking users to indicate to which extent the information is believable.

### 2. Measure knowledge change

Based on the weak assumption that only credible information is recalled.

### 3. Measure attitude or behaviour change

Based on the strong assumption that only credible information can affect attitude or behaviour.

# Persuasive Technology

# Technology aimed at Changing Human Behaviour

Why?

- To help the individual achieve their **personal goals**, e.g. quit smoking or fight alcoholism, lose weight, eat healthier, exercise more.
- To encourage contribution to **group / society goals**, e.g. save energy, reduce waste, reduce noise, vote, volunteer, etc.
- To achieve a **third party's goals**, e.g. increase sales, optimize system load, improve service, e.g. advertisement, P2P file-sharing systems

Will only introduce  
some Behaviour Change Techniques

# Goal setting

- Set a behaviour goal

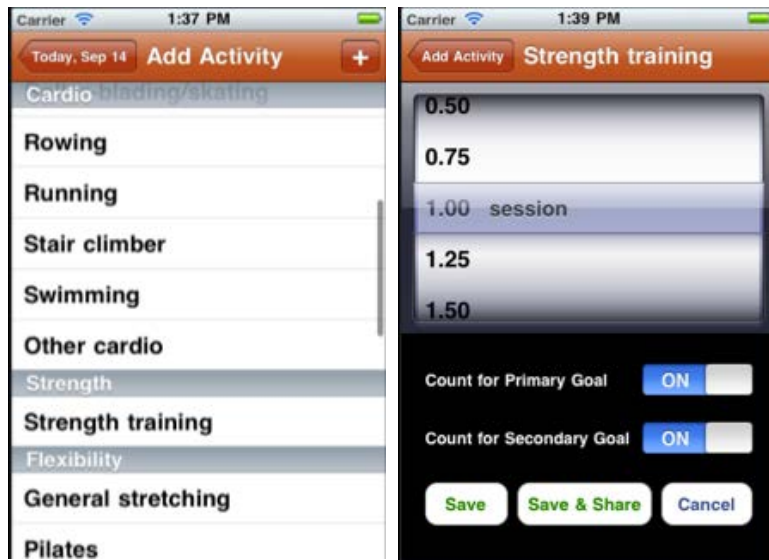


Now let's think about a realistic goal for the coming week. Remember that you currently walk 8000 steps a day. What do you think if we aim to add another 10% (800 steps) or 20% (1600 steps) to that? This is entirely up to you, and we can discuss which goal suits you best..

Nguyen &  
Masthoff, 2010



Superhub, 2013



GoalPost  
Munson &  
Consolvo, 2012

# (Self-)Monitoring

- (Self-)record specified behaviour, and provide access to the user



Hi Hien,  
Thanks for keeping track of your progress. Monitoring how well you do is the first step to success.  
Just enter your pedometer's readings for yesterday or any other day using the form below.

Day:

Steps:  steps

Calories:  kcal

Distance:  km

Notes:

# Feedback

- Provide feedback on monitored behaviour



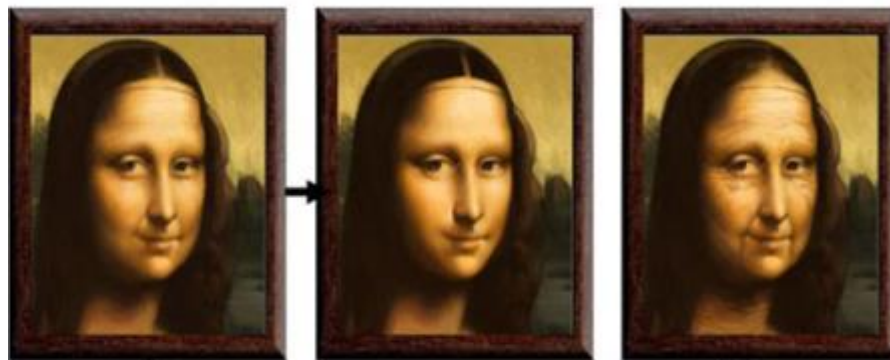
Well done, Hien! Not only have you reached your daily goal, you also walked 3000 steps more than yesterday and 6000 more than the same day last week.

You also burned 565 calories; that is roughly 4 x Can of Coke (330 ml).

Nguyen & Masthoff, 2010



Midden & Ham, 2009



Nakajima & Lehdonvirta, 2013



Arroyo et al, 2005



# Review goal

- Assess extent to which goal is achieved, identify influencing factors, amend goal

Week 10 (28/09 - 04/10): I walked 76,830 steps. I was 76,830 steps ahead of my goal



Week 9 (21/09 - 27/09): I walked 36,250 steps. I was 31,909 steps behind my goal

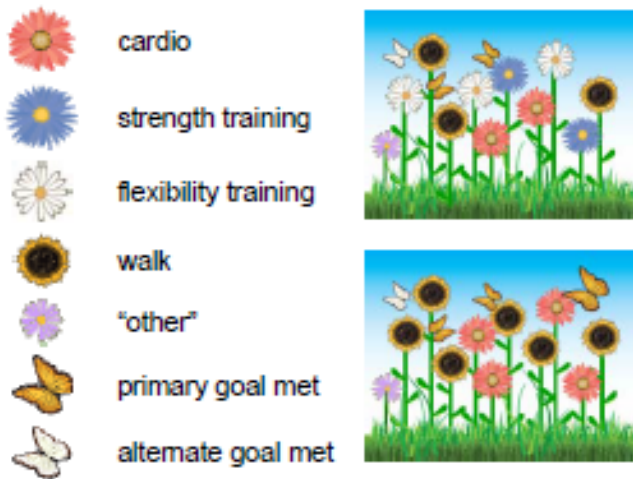


Hi Hien,  
You were short of reaching your goal by 2000 steps last week. You still achieved 4000 steps more than the previous week. Was there anything that stopped you from achieving more last week? Did you have any difficulties?

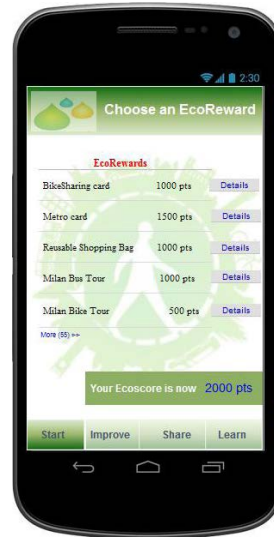


# Reward (Conditioning)

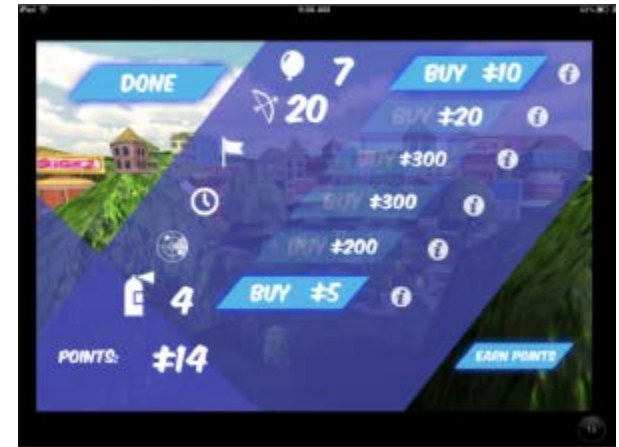
- Provide a reward if the behaviour is performed



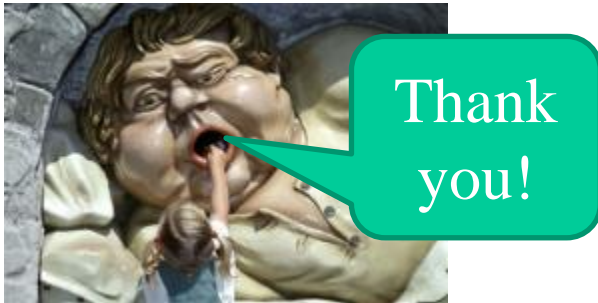
Consolvo et al, 2008



Superhub, 2013



Berkovsky et al, 2012

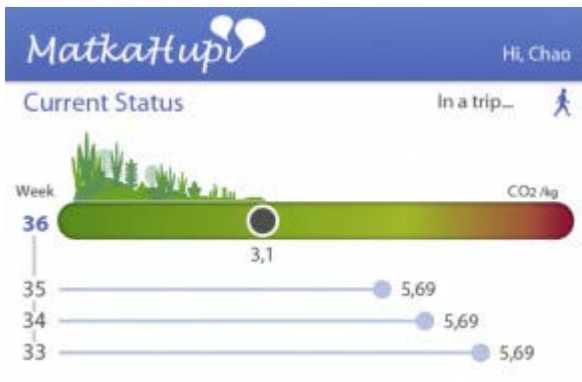


Efteling amusement park, 1959

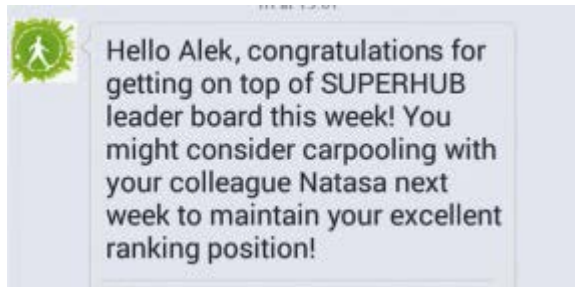


# (Social)-Comparison

- Provide comparative data (cf standard, own past behaviour, others' behaviour)



Gabrielli et al, 2014



Farzan et al, 2008

# Punish

- Provide a punishment if the behaviour is not performed



If you don't brush your teeth, the aquarium gets dirty and fish get ill.  
Nakajima & Lehdonvirta, 2013



Negative punishment  
= withholding reward



Fish become sad and stop growing.  
Lin et al, 2006



Power to appliances is turned of.  
Kirman et al, 2010


# Prompt (Trigger, Call to action)

- Provide a stimulus to elicit the behaviour


**70505:** Amnesty free msg: IRAN  
Imprisoned woman denied  
medical care could go blind <http://amn.st/1nnSTtO> Rply TREAT +  
name to help save Zeynab's  
sight 2OptOut rply Stop  
20/06/2014, 16:04


Papier Hier!  
Papier Hier!  
(Paper here!)




 [You have new notifications.](#)

A lot has happened on Facebook since you last logged in. Here are some notifications you've missed from your friends.

 **Judith Masthoff**

 [2 pokes](#)

 [4 new notifications](#)

[Open Facebook](#)

[View Notifications](#)





# Threaten (Appeal to fear)

- Threaten to punish or remove reward based on future behaviour



“This is what you will look like if you keep smoking”  
(Andrés del Valle & Opalach, 2005)

# Verbal persuasion

- A credible source argues, with evidence, in favour of the behaviour

**Daphne:** *Have you considered eating more fruit?*

**User:** *No.*

**Daphne:** *It is good for your health as it helps prevent cancer.*

**User:** *Fruit is boring! It's granny's stuff!*

**Daphne:** *May be pears are boring. But avocados are different! Did you know it's Californians' favourite?*

(Grasso et al, 2000)

**Portia:** *You do sport and look after your health with regular medical check-ups. Why don't you try to increase the quantity of fruit and vegetables in your diet? I'm sure you can do it if you want to.*

(Mazzotta et al, 2007)

# Motivational Interviewing

- Elicit self-motivating statements and evaluation of own behaviour to reduce resistance to change



*So, what do you personally think of the result and what would you like to do next? Last time we met, you said that you thought that your current level of walking was high. Has the result today affected that?*



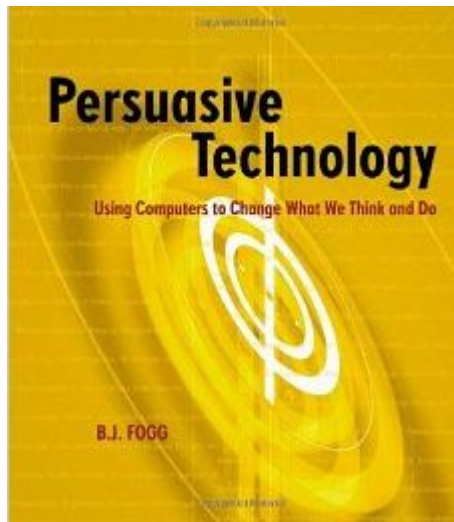
*So at the moment, you think that increasing how much you walk every day is very good. Considering this, where would you like to go from here?*

**User:** I can't think of any reason to walk more



*If you were to guess, what would be one good reason for you to consider walking more regularly?*

# Further reading



B. J. Fogg, part-time professor at Stanford,  
pioneer of persuasive technology  
(see <http://www.bjfogg.com/> )