The Ethical Conundrum of Personalized Persuasive Technology

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Media Panic Lately

Have Smartphones Destroyed a Generation?

More comfortable online than out partying, post-Millenials are safer, physically, than adolescents have ever been. But they’re on the brink of a mental health crisis.
Your smartphone is making you stupid, antisocial and unhealthy. So why can’t you put it down?

A decade ago, smart devices promised to change the way we think and interact, and they have – but not by making us smarter. Eric Andrewee explains the growing body of scientific evidence that digital distraction is damaging our minds.

A digital detox is key to surviving the 21st century.
Persuasion

**persuade**

**verb** [T]  •  **US**  /perˈswɔːrd/  •  **UK**  /paɪˈswɔːrd/

⇒ to make someone do or believe something by giving them a good reason to do it or by talking to that person and making them believe it:

*If she doesn’t want to go, nothing you say will persuade her.*

*It’s no use trying to persuade him (that) you’re innocent.*

*He is trying to persuade local and foreign businesses to invest in the project.*

*Using a bunch of bananas, the zoo-keeper persuaded the monkey back into its cage.*

**FORMAL** The first priority is to persuade the management of the urgency of this matter.

*Her legal advisers persuaded her into/out of mentioning (= to mention/not to mention) the names of the people involved in the robbery.*

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**More examples**

*Clever salesmanship can persuade you to buy things you don’t really want.*

*We only need one more player for this game – can you persuade your sister to join in?*

*I have a suspicion that he only asked me out because my brother persuaded him to.*

*Johnson was influential in persuading the producers to put money into the film.*

*She used her womanly charms to persuade him to change his mind.*
Personalization

To optimize the interaction and/or the functionality of an application dynamically to the individual user regarding efficiency, usability, learnability etc.
Reflection: my research journey 1988–2018

Reflection dimensions:

Goals?
- User’s own
- Somebody else’s

Transparency?
- User know she is being persuaded
- User is unaware

Symmetry?
- Both parties have equal information about each other
Stop 1: AI in Education, Intelligent Tutoring Systems

1 system: 1 user

Vassileva (1998) DCG+GTE, Instructional Science
Vassileva & Deters (1998) DCG, BJET

AI planning approach for ITS
Instructional planning (TOBIE, 1990)
Dynamic Courseware Generation (DCG, 1992-98)
Adapting Information Retrieval (Menus) to User Experience

Vassileva J (1996) Task-Based Adaptation … UMUAI
Stop 1: Ethical considerations

1 system - 1 user

Whose goals? Of system of user

Transparency? Yes

Symmetry? YES (context based)
Stop 2: Distributed Environments (Web)
m users - n apps

Autonomous Heterogeneous Interacting

Multi-agent systems

Toolbox for investigating socio-economical phenomena on a macro-scale

Autonomous behaviours driven by Intrinsic mechanisms: knowledge, inner-wiring/algorithrm/ personality emotions (semi randomness)

Externally regulated by incentives, protocols of interactions, rules and regulations, other agent’s behaviours

Mechanisms for cooperation? Negotiations, Prisoner's Dilemma, Repeated Interactions, ... Rumours, Trust, and Reputation.

All this work - evaluated in simulations

Stop 2.5: Multi-agent Peer-Help System

I-Help (Greer, et al. 1998-2001)

Human-Agent Interaction

Anthropomorphic Agents:
- How much autonomy?
- What type of relationship?
- Agent "Persona"?
2.5 Appealing to the greedy: a personal agent economy

Human Help costs effort and time

Market regulates the supply and demand:
- Help in exchange for currency
- Rate of pay is negotiable (by agents)
- Users set negotiation parameters for agents
- Users pay penalty if agent’s deals are ignored

Persuasion = negotiation

Agent decides offers and counter-offers calculating an utility function with parameters set by users:
- This model allows for trust relationships to evolve between users (mediated by their agents)
- Users can build coalitions (trusted, interest-based communities)
- Simulations can be build to study sustainability, benefit…

Stop 2: Ethical considerations

N systems – M users

Whose goals? Of system and of user

Transparency? Yes, assuming that the personal agent is transparent to the user

Symmetry? Yes and No

Yes - because of decentralization, UMIs are scattered around each agent, contextualized fragments

No - because of the central Matchmaker agent keeping all student profiles: knowledge, cognitive style, eagerness, helpfulness, popularity, star-sign
Stop 3: Motivating Participation

Lessons learned from I-Help deployment (2 years, 3 countries, over 2000 students): Huge variance in participation

Why do people offer their time and resources?

- Some are altruists
- Some would help their friends and hope to make new friends
- Some seek glory
- Some seek teacher’s attention
- Some seek high marks
- And even money

Need for Personalized Persuasion!

Motivating Participation on the Social Web

Comtella

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Comtella 2005 MADMUC Lab
Department of Computer Science, University of Saskatchewan
Stop 3.1 and 3.2

Ethical Considerations

Goals: System and User - improve user’s test scores;

Transparency: Yes - user understands they are being persuaded, or that they play a game

Symmetry: No - user does not understand how the system works, the system has all the user’s data, the user has no ways to influence the system
Stop 4: Recommender Systems

4.1. Encourage user ratings and reciprocity

Explanation /visualization of the effect of rating → resulting in a visual recommender system

Encouraging reciprocity in views /ratings

4.2 Transparency And User Control of RS

Problems addressed:
- Lack of Transparency of Recommendation
- Lack of user control

KeepUP: a hybrid recommender system for RSS feeds

4.3 Social Networks and Recommendation

Problem:
- Aggregating SN streams
- Information overload → Recommending posts
- User control → by content and by friends


Problem:
- Facebook stream data: how to Keep Up?
- Transparency → Visualization
- User filtering options (by time, friend)

4.4 P2P Social Networks: User Privacy and Control

Problems addressed:
- Privacy
- Information Overload
- Filter bubble

Recommending Content with Serendipity on P2P Social Network (simulation with data from StudiViz)

More problems addressed:
- Transparency (of the filter bubble)
- User control

Interactive Visualization in a Real Social Network (Friendica → Madmica Social network)


Step 4: Ethical Considerations

Goals - both system and user (system makes recommendations to satisfy better the user’s goals)

Transparency - yes (visualization giving the user an idea of the recommender’s workings)

Symmetry - yes
  • the user has means of control / manipulation of the algorithm (3.3, 3.4, 3.5, 3.6)
  • the user has control over her data (3.6)
Step 5: Persuasive Technology for Behaviour Change

Ends and Means (Kaptein & Eckles, Persuasive 2010)

- Steps 1-4 were mostly about the Ends (What)
- Now focus on the Means (How)

5.1 Non-Personalized Approaches

- Persuasive “Emotional” agents in educational systems (2001)
- Gamification in Education (2014-
- Family support of isolated elderly (2014-2017)
5.1.1 Persuasive “Emotional” Agents Appealing to User Compassion

An introductory interactive course on C++ delivered by an animated persona—material presented by human voice—users have to answer test questions—persona responds to test performance with facial expression

- Females felt a pressure to perform better to please the persona!
- Both genders preferred the emotional persona
- No significant difference in test performance

5.1.2 Gamification in Educational Systems

and in the Workplace (data entry)

Collaboration with Brazil

University of Sao Paulo (USP) - Sao Carlos

Federal University of Alagoas - Maceio

Points, Levels, Badges, Leader-boards
5.1.3. Family communication support for elderly people

Social Connector Project, University of Chile

Francisco Gutierrez, Prof. Sergio Ochoa

Persuasive Strategies

- Ease of use
- Awareness of others’ activities
- Workload-based recommendations for check-ins
- Prompts

Step 5.1 Ethical considerations

Goals: System’s, in assistance of the user’s goals

Transparency: Yes, user realizes that the game is to persuade her

Symmetry: No, user can’t influence the system, has no control over the data collected about her
5.2 Personalized Persuasive Technology

Not Personalized, but Tailored!

- Persuasive Strategy Tailored to a User Stereotype or Selected as start. Static.
- User Profile = Stereotype (classification problem)

Stereotypes based on:

- Direct Mapping to Strategies (e.g. Cialdini)
- Psychological Types / Gamer Types -- mapping to strategies
- Demographic features mappings
5.2.1 Mapping Gamer Types to Strategies

R. Orji, J. Vassileva, RL Mandryk (2014) Modeling the efficacy of persuasive strategies for different gamer types in serious games for health, UMUAI

Persuasive Games for Healthy Eating

R. Orji, J. Vassileva, RL Mandryk (2017) Improving the efficacy of games for change using personalization models, TOCHI

Rita Orji, PhD Thesis Work

MT large study with storyboards illustrating strategies, participants take also the BrainHex gamer type test
5.2.2 Mapping demographics to persuasive strategies

Kiemute Oyibo, PhD work

Mapping user culture, gender, age on perception of design aesthetics, usefulness, usability, trustworthiness

Mapping Culture on Socio-Cognitive Theory Determinants of Behaviour Change.

- Canadian → Self-Efficacy and Self-Regulation
- Nigerian, Chinese → Social Support and Outcome expectation

Goal: Design of a persuasive coach for home exercise using the TTM

Mapping common PSD strategies to the stages of the TTM in the context of home-based exercise.

- Preparation Stage → Cooperation strategy
5.2.3 Persuasive technology for E-Commerce

Ifeoma Adaji, PhD research

- identifying the factors that improve e-commerce personalisation
- identifying how these factors influence the continuance intention of e-shoppers
- exploring the susceptibility of these factors to persuasive strategies

For example, if an e-commerce shopper has been identified to be susceptible to the influence strategy scarcity, when shopping for foods/groceries online, will the shopper still be susceptible to the scarcity strategy.
Step 5.2.2 Ethical Considerations

Goals: System’s, in assistance of the user’s goals

Transparency: No. Kaptein & Eckles argue persuasive strategy should not be transparent, or it won’t have effect.

Symmetry: No, the user can’t influence the system, has no control over the data collected about her.
To be effective PPT needs to model users → User Data is the core of PPT. The more data, the better. Successful services hoard user data → Asymmetry

To be effective PPT needs to not reveal its strategies → Lack of Transparency

The Goals? Are they the same as those of users? Can we trust companies providing PPT services? -- that they pursue the same goals? -- that they safe-guard the user data?
How to solve it?

Remove the asymmetry!

Big Data is harmful!

Decentralize the data!

PPT powered by small data - like the agents in I-Help.

User data securely stored, under user control.

Peer to peer persuasion, on a equal basis, with transparent ends and means.

User acceptable persuasive ends and means, expressed in contracts.

Technology exists already: Distributed ledgers

Adoption? Only through regulation.
Epilogue

No reason for Panic.

History shows such panics happening every time when new transformative technologies appeared.

Writing

Printing

Cars

Society evolves, people adapt.
Map of the PPT area

Psychology

Persuasive Technology

Marketing

Behaviour Change

Health

AI

Personalization
Evolution

- Social Networks: Targeted Ads
- Persuasive Technology
- Personalization
- Behaviour Change

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Tech Insiders Call Out Facebook for Literally Manipulating Your Brain