Theme issue on persuasion, influence, nudge, or coercion (PINC)

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Published online: 10 July 2012
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Many of us would like to change some aspect of our behavior, such as eating better, exercising more, or reducing our energy consumption. Nudging methods, derived from behavioral economics and social psychology, have recently become popular, suggesting ways of how to achieve this. But how effective are they and can technology be designed to exploit them?

This themed issue considers how can we design new technologies to help people change their behavior, through either using persuasion, influence, nudge, or coercion (PINC). It includes a range of application areas and theories, ranging from shopping in supermarkets, insomnia therapy to active lifestyles. In particular, it explores how a variety of environments can be re-structured in innovative ways, through the design of pervasive, ambient, and wearable technologies. An overarching goal is to help people change their behavior, by providing new kinds of technology-augmented information that cangently nudge, convincingly persuade, cogently influence, or explicitly coerce. Underlying all of these techniques, however, is the nagging question of whether it is ethical, desirable, or sustainable to be nudging people in a desired direction. Questions this raises include:

- How can pervasive technology be deployed in the domain of PINC?
- When is the appropriate time to begin, reduce, or end intervention?

- Do PINC methods have the potential to lead to durable, long-term behavior changes, or only short-term changes in behavior?
- Are PINC methods ethical?
- How can we extend the scale of intervention in a society using mobile devices?

The first paper in the special issue called “Decision-making in the aisles” by Kalnikaitė, Bird, and Rogers presents a novel research approach for informing the design of persuasive technologies for “low-involvement” shopping (i.e., that which does not involve much decision-making). The authors discuss three studies, two of which explore current shopping practices and shopping information technologies, and the third introduces a new “ambient” display for shoppers. The research looks at how to “nudge” shoppers into purchasing product A or B, based on different criteria, such as nutrition, food miles, and price. The findings from their studies of using the different technologies in situ suggest that when making purchases in a supermarket for a weekly shop, simple and immediate feedback was most effective at supporting the fast and frugal decision-making that shoppers employ. Instead of being overwhelmed with information, it was found that shoppers prefer a small amount of relevant information to be made more salient. The authors conclude with several design principles, among them—showing less information in a salient way, allows for hands-free interaction that does not obstruct the shopping experience.

The second article “A foundation for the study of behavior change support systems,” by Oinas-Kukkonen presents an overview of theories of behavior change. These theories have largely been developed in cognitive and clinical psychology together with a conceptual framework for a hypothetical behavioral support system. This paper provides prescriptive guidance on how to set goals for

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behavioral change, suggesting that persuasion is a key mechanism. A further model is proposed for designing and evaluating persuasive systems for behavioral change, suggesting a range of factors that are important and the types of software that needs to be built to persuade, for example, task support and dialogue. A table is presented, listing studies that have been about behavioral change and have followed the (Persuasive System Design) PSD model. An example area that could benefit—health—is then suggested. High-level descriptions of possible interventions are proposed, such as the use of quizzes, games, etc., illustrating how they could map onto the goals of behavioral change in the first conceptual framework. Finally, a set of questions is presented that need to be addressed to move the research in this area forward. The assumptions held by practitioners and weaknesses in current practice are also discussed.

The next paper “Persuasive strategy in mobile insomnia therapy” by Robbert Jan Beun presents three general persuasive strategies for the design of a virtual mobile coach. This mobile coach (CBT-I application) functions as a first intervention for insomnia treatment in a stepped care context. The presented strategies are based on general principles and methods from cognitive behavior therapy and communication theory. In this paper, it is assumed that the motivation to perform the therapy exercises can be significantly improved by tailoring them to the characteristics and the circumstances of an individual user. Two of the presented strategies aim at tailoring the intervention: alignment and adaptation; the third strategy, motivational support, aims at the coach’s communicative activities to take away motivational blocks. Given the characteristics of the insomnia treatment, it is concluded that mobile and ubiquitous systems are promising monitoring and delivery devices, as a first intervention, provided that the information is reliable and that obtrusiveness is minimized.

Kaptein and Van Halteren in “Adaptive persuasive Messaging to increase service retention” describe the development and testing of a system that capitalizes on “persuasion profiles” to improve the persuasive power of email reminders for wearing a physical activity monitoring device. Emails are framed in terms of three types of persuasive message: “scarcity” (what you’re losing by not docking), “authority” (expert recommendation), and “consensus” (what others “like you” are doing). The novelty of the system is that emails are adapted from a neutral tone to one of the above, depending on the persuasion profile used; what on average is found to be more effective or what is found to be effective for that user. Effectiveness is judged by assessing “click through,” that is, whether the user did in fact sync their dongle within 24 h of reading the message. The authors tested the system out on a large group of participants ($N = 1,129$), split into four conditions (baseline, best strategy from a pilot, random, and adaptive). They conclude that

with the adaptive strategy, users are 6 % less likely to drop out (not dock for >30 days) from the study.

Comber and Thieme in “Designing beyond habit: Opening space for improved recycling and food waste behaviors through processes of persuasion, influence and coercion” explore persuasive technologies in the context of recycling and waste disposal. Social coercion is used as a motivator for more sustainable practices. The authors present a system called BinCam, which photographs the contents of a user’s trashcan and uploads the images to Facebook. Images are tagged with the number of food waste and recyclable items, using the empirical method of Mechanical Turk. The system was deployed for several weeks for 22 participants. The authors’ present findings that suggest BinCam raised awareness of users’ recycling practices and induced feelings of shame/guilt when they observed that their practices were “worse” than others.

Orji, Vassileva, and Mandryk in “LunchTime: A Goal-Based Persuasive Game for Long-Term Dietary Behavior Change” describe the theoretical foundations, design and development of LunchTime a “slow-casual” game that aims to teach people how to make appropriate food choices in restaurants. The paper begins by giving an overview of the literature on motivation that underlies the design of the LunchTime game, an interactive multiplayer game. The players’ objective is to choose the healthiest food possible in line with their health goal. The initial design is a cross platform application that can run on Android, iOS powered phone, and the web (desktop). The authors aim to effect behavior change using a combination of a goal-based approach, prescriptive feedback, social influence (social facilitation, competition, comparison, and cooperation), and rewarding mechanisms, built as part of a game. The result from their evaluation study showed that LunchTime facilitates learning, reflection and promotes positive dietary attitude change.

The article “Towards a Persuasive Mobile Application to Reduce Sedentary Behavior” by Dantzig, Geleijnse, and Van Halteren presents two studies, addressing sedentary behavior in the workplace. Both involve the delivery of feedback to a mobile phone. In the first study, text messages containing links were sent to users after periods of inactivity were detected using a commercial activity sensor. The impact of the types of messages on subsequent behavior was measured. The authors conclude that the messages reduce overall sitting times, but that this also happens when the messages are not read (simply the arrival on the phone is enough to prompt users). The second study developed this idea further by implementing a simple mobile phone app that detects user motion and triggers audio or haptic alerts in response to prolonged sitting. A short user study exploring user opinions of this software is described. The paper concludes with a set of guidelines for future application developers and designers.