SUPERHUB: Towards argumentatively rich persuasive communication in large-scale, applied behaviour change systems

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In the SUPERHUB project our goal is to build a large-scale, multi-platform, multi-lingual transport and mobility application that enables its users to plan and resource their urban travel whilst simultaneously developing environmentally sustainable travel habits. Because the system is designed primarily to provide generic multi-modal journey planning functionality, the end-users can have widely varying attitudes towards various transport modes. For example, one might always use their car even for a short journey, whereas another might be very environmentally aware and always aim to use a combination of cycle-share and public transport whilst journeying around the urban environment. As a result we have had to use a variety of behaviour change techniques, reported in [3,6,4,5], to account for the differences between individual users.

A useful model of behaviour change is the COM-B model [7] in which the ability of a person to change their behaviour is predicated upon their capabilities, opportunities, and motivation. The presence of all three aspects will increase the likelihood of successful and sustainable behaviour change whereas the absence of any aspect can inhibit that change from occurring. Of particular importance in this approach is motivation. Without motivation, even a capable person who has plenty of opportunity is unlikely to change. Within SUPERHUB, one activity is to use persuasive messages to motivate our users sufficiently for other techniques to become effective. Using questionnaires and segmentation mechanisms we sort our users into a range of groups based on their attitudes to travel. In other work we have identified sets of motivational messages which members of these groups respond positively to [2]. We thus expose our users to group-appropriate motivational messages in order to prime them for the other behaviour change techniques. We are currently reconstructing our existing motivational messages, which are essentially enthymemes, into fully specified arguments so that they can be explored using more appropriate interaction techniques [8]. The aim of this approach is not solely to motivate our users to alter their behaviour, but to do so in an informed way so that any subsequent behaviour change is lasting rather than transient.

Throughout September and October 2014 SUPERHUB will be deployed in a series of large-scale trials to $>$1000 users in each of Barcelona, Helsinki, and Milan. Before using the system, users will complete a questionnaire which is used to allocate them to a segment which captures that users attitudes towards various modes of transport[1].

Subsequently, once the user is active on the system, they will be sent scheduled persuasive messages which are targeted to their allocated segment. In coordination with a set of gamified, challenge-based techniques and interactions, which are reported in [10], we conjecture that our users will change their travel behaviour during the active phase of the trials compared with their behaviour during the passive, baseline establishing phase. Our goal is to demonstrate that an individual can be helped to form more environmentally sustainable travel habits by using a combination of complimentary techniques.

One thread of research that we are pursuing is into enhancing the effects of persuasive messages on transport behaviour, specifically, how these messages can be made more effective in motivating people to form better habits. For example, by using simple interaction protocols such as those described in [11] and reconstructing and suitably representing persuasive messages so that they can be effectively utilised within both dialogue and automated argumentation systems[9], can we establish whether a persuasive message is more or less effective (1) when a user can explore the underlying arguments behind it, and (2) whether the ability to reply affects the effectiveness of the message. By pursuing answers to these questions within the context of an extant system that captures actual user behaviour and its change over time, we can establish whether these techniques have a lasting real-world effect and root our findings in actual patterns of behaviour rather than perceived behaviour; in other words letting actions speak louder (and more persuasively) than words.

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