

Capacity Area B2 Topic 1.1 Deliverable 2

Assessment of long-term living-lab experiments. Analysis of effectiveness and barriers for large-scale exploitation of ICT tools favoring less car-dependent lifestyles through user awareness and social interactions

Responsible Researcher: Francesca Cellina, ISAAC, SUPSI.

Analyses of the behavior change effectiveness of persuasive apps in the mobility domain have been performed through both mobility data we collected on the field, within living labs and on purpose developed persuasive apps, and meta-analyses already available in literature. Writing of the final deliverable is ongoing (deadline: end of 2020). It will mostly consist in a collection of published/under review research articles, in each of which we presented and discussed specific aspects of such analyses, which deal with the research questions reported in italics below.

Which are the key limitations affecting current persuasive apps in the mobility domain? Is it possible to overcome them, by adopting a user-centered design and evaluation process? Which open challenges remain to be addressed? Meta-analyses of previous interventions already available in the scientific literature highlighted that the related apps were mostly lacking grounds in a proper behavior change theory and they over-relied on “one-size-fits-all”, simplistic point-based systems. We therefore designed a persuasive app whose features are strongly linked to a behavior change theory (the “transtheoretical model of behavior change”) and leave plenty of room for customization of goals and challenges, in turn leaving room for intrinsic motivation towards change to emerge and activate a behavior change process at the individual level. The evaluation of the app’s features from the perspective of its field testers showed however the need for including such persuasive features within other smartphone apps already used by the individuals (such as for instance multi-modal travel planning apps), in order to increase chances for app users to access and interact with them. Furthermore, features capable of evoking the feeling of belonging to a community, that provide support and helping relationships for a change at the collective level, would be highly beneficial. The related paper has been published on “Sustainability” (<https://doi.org/10.3390/su11082281>).

Thorough analyses of the effectiveness of soft transport policy measures are needed in order to support policy-makers in their decision when resources are scarce. ***Can proper randomized controlled trials (RCTs) be performed to assess the effectiveness of persuasive apps in the mobility domain?*** We explored the practical feasibility of RCTs through a field intervention. Critical aspects precluding strict RCTs appeared in particular to be related to the opt-in, voluntary framework characterizing not only app use in real-life, but also app use in experiments: there is a risk that experiments assess the impacts on “already converted” users of public transport and active mobility, which differ from the app’s actual target group. The related paper has been published on “Sustainability” (<https://doi.org/10.3390/su11092674>).

Do self-selection and attrition biases occur in the use of persuasive apps, stemming from their opt-in, voluntary framework? To tackle this question, we analyzed baseline mobility data gathered from users of a persuasive app in the mobility domain (collected during the app validation period, when the behavior change motivational features were not enabled), and compared them with the corresponding mobility data of the reference population, collected by the Swiss Mobility and Transport Census. This allowed to estimate possible self-selection biases; then, we looked at the relations between baseline mobility data and the number of weeks of app’s active use, to estimate possible attrition biases (see Figure below). No evidence of such biases was found, which – at least for the specific case we analyzed – leads to exclude that these apps mostly attract “already

converted” individuals. The related paper has been submitted to “Computers in Human Behavior” and is currently under review.

How to maintain the long-term interest by “mainstream car drivers” for a sufficient period of time to let them internalize new mobility habits? Despite the above results, this is still an open research challenge. We opted for including potential users of a persuasive app in the very design of its features, in a living lab framework. One strategy emerged from the lab might be to include tangible prizes, who would act as initial “hook” to raise the interest of such individuals (external motivation), to be gradually replaced by intrinsic motivation related to personal goals for change and satisfaction related to progress towards them. Including tangible prizes however implies that, given the current level of automatic mobility tracking technology, specific app features are adopted. We are currently finalizing a paper (to be submitted to “Travel Behavior and Society”) discussing how we tackled this issue and the related results. Finally, from a broader perspective about urban governance and sustainability transitions, in another paper we discussed how the living lab activated a public debate on urban transport and land planning topics (thus reinforcing the app’s potential behavior change impact) and turned into a trigger to favor the adoption of participatory governance practices at the urban level. The related paper has been published on “Sustainable Cities and Society” (<https://doi.org/10.1016/j.scs.2019.101911>).

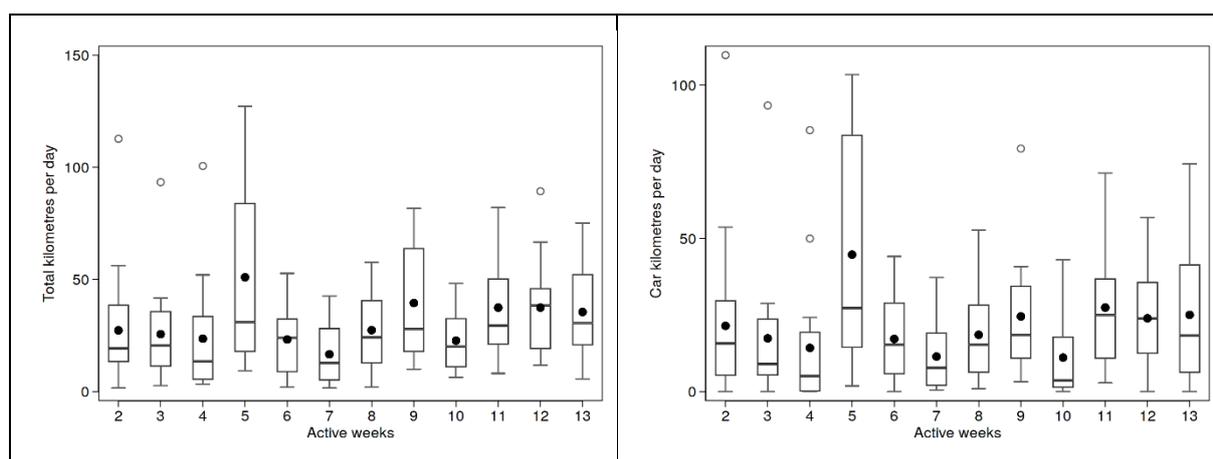


Figure: Box plots with means (filled circles) of mobility baselines of Bellidea users over the number of active weeks: total daily travel distance and daily travel distance by car.