Can Digital Apps Inflict Behavioural Change in People's Means of Transportation?

Research Question

Can digital apps, like those that track CO_2 emissions in real-time, effectively encourage people to choose sustainable transportation options?

Introduction

Transportation is one of the largest sources of greenhouse gases, which cause climate change. To fight this, it's important that people choose more sustainable transportation, like taking public transit, cycling, or walking. Digital tools, such as mobile apps that show users their real-time CO_2 emissions, offer notifications, or include games to motivate users, might help people make these sustainable choices. This review looks at how effective these digital tools might be by considering two main theories: the Theory of Planned Behavior (TPB) and the Intervention Mapping (IM) approach.

Theory of Planned Behavior (TPB)

Theory of Planned Behavior (TPB), according to Montano and Kasprzyk (2015), teaches us why and how people behave the way they do. TPB states that a person's behavior is, to a greater extent, dependent on his/her intention to do the behavior, and this intention is influenced by three things: their attitude toward doing the behavior, subjective norms, and perceived control over doing the behavior. Attitudes mean whether a person thinks a behavior is good or bad. Subjective norms refer to the degree to which an individual feels either encouraged or pressured by others to act in a specific way. Perceived behavioral control relates to the ease with which an individual feels they can perform a specific behavior.

Through TPB, mobile apps for sustainable travel may be able to promote people's attitudes by making the personal and environmental benefits of public transport or cycling overtly apparent. For example, an app could inform shoppers how much they are conserving the planet with each walk or bike trip instead of a car ride. Apps could also encourage subjective norms by enabling individuals to see what green choices friends or other individuals within their group are making, creating positive social pressure. Lastly, apps can provide greater perceived control by simplifying sustainable transport options to make them more obvious, convenient, and easy to access—for instance, by providing instant bus or train schedules or advising the optimal cycling route.

Intervention Mapping Approach (IM)

The Intervention Mapping (IM) approach, led by Kok et al. (2015), is another system through which effective promotion of behavior change can be understood. IM provides evidence-based practical solutions derived from theories specifically to empower individuals to learn more sustainable or healthier habits. IM aims at developing interventions that confront variables favoring or discouraging behaviors head-on.

Using the IM approach, mobile applications can employ strategies like nudging, personalized feedback, and public commitment. Nudging is making sustainable alternatives the easier or default option by doing things slightly differently, such as automatically showing public transport first. Personalized feedback might consist of personalized messages revealing precisely how each person's transport decisions affect the environment. Personalized feedback makes users actually see the results of their own actions. Public commitment is having people commit in public to making sustainable changes and making them feel more accountable to do so and to continue with it. Moreover, apps can foster communities where users support and encourage each other and provide emotional and practical assistance to sustain positive change.

Comparative Analysis of Theories

TPB and IM methods both deliver precise insight, but differ in terms of potency. TPB is best suited for understanding why people decide to change behavior in the first place since it emphasizes individual motivation and cognition, such as attitudes, norms, and control perceptions. TPB, however, fails to always specify exact ways of impacting these behaviors. IM steps in to rectify the shortage by offering clear, concrete methods to transform theory into effective interventions.

These theories can be integrated to result in more effective digital interventions. TPB establishes key factors including attitudes, subjective norms, and perceived behavioural control, which provide guidance on what should be targeted by an app to influence transport decisions. IM subsequently provides specific means, for example, nudging, individually designed feedback, and public commitment, through which to implement them.

For instance, while TPB identifies convenience making and social support making sustainable transport easier, IM suggests using electronic interventions like personalized feedback or public pledges to actually make these a reality. Apps can therefore enable users to be taught the environmental benefit (attitudes), see others encouraging their actions (subjective norms), and think that taking up sustainable alternatives is possible and easy (perceived behavioral control).

Directly responding to the research question, combining TPB and IM strategies in digital interventions can significantly increase their ability to change transportation behaviors. An app that explicitly communicates the personal and environmental benefits of sustainable transport (TPB's attitude component), provides examples of peers who effectively implement these behaviors (subjective norms), and decomposes the practical steps involved (perceived behavioral control) using IM strategies—such as nudging or feedback—can effectively induce long-term behavior changes.

Conclusion

Digital interventions, especially those providing immediate feedback on CO_2 emissions, have great potential to influence people to make transport choices that are sustainable. The integration of the Theory of Planned Behavior and Intervention Mapping approaches ensures that digital interventions are not only theoretically sound but also effective in practice. Through the interventions' focus on attitudes, social norms, and perceived facilitation of behavior using concrete, user-friendly methods, digital interventions have the potential to influence lasting changes towards transport behaviors that are sustainable.

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