Deflected by the Tin Foil Hat? Word-of-Mouth, Conspiracy Beliefs, and the Adoption of Public Health Apps

Mobile health apps have become an integral part of public health management. Thus, unsurprisingly, in light of the COVID-pandemic, many governments turned toward technology-facilitated solutions to tackle the crisis. Contact tracing apps that use mobile technologies to identify individuals who may have been in contact with an infected person, play a key role in this endeavor. Although these apps have immense potential to limit the spread of the disease, the introduction of the COVID-tracing apps was met with widespread skepticism (e.g., by December 2020 only 28% of German and 15% of French citizens had downloaded the respective COVID tracing apps).

Since, on the one hand, a tracing app's effectiveness for society depends on each individual's participation, and, on the other hand, the app may invade the users' privacy, controversial debates arose among experts and private individuals. These debates gave rise to a plethora of conspiracy theories about COVID and the tracing apps (e.g., that the Gates Foundation and corrupt politicians orchestrated the pandemic and exploit tracing apps to control the unwitting population). As conspiracy theories flourish in times of crisis, and extant research suggests that conspiracy beliefs can substantially hinder public health efforts, their potential impact is a primary concern for policymakers. However, there is a lack of knowledge on how conspiracy beliefs might affect tracing app adoption.

Such insights are crucial for policymakers beyond the scope of the current pandemic. COVID tracing apps are a subset of a wide array of public health apps (i.e., apps issued by governmental agencies to improve public health) that are increasingly used to provide personalized health information and track communicable diseases. However, as public health apps are issued by public agencies and targeted at the entire public, they are likely to be associated with conspiracy beliefs.

Against this background, this study focuses on the interplay between word-of-mouth (WOM) and conspiracy beliefs and their effects on public health app adoption. Three observations surrounding public health apps and conspiracy theories motivate this focus. First, as public health apps process sensitive information (e.g., geo-locations) that can be misused, they likely spark intense debates, promote WOM, and, as such, catalyze conspiracy theories. Second, conspiracy theories typically originate from WOM in peer-to-peer communication or social media communication by (alleged) experts. Therefore, WOM by both peers and experts is

central to understand the spread of conspiracy beliefs. Third, extant research shows that WOM strongly influences consumer behavior concerning services that are associated with high risk. Thus, systematically encouraging WOM contradicting conspiracy beliefs could be an effective instrument for policymakers to debunk conspiracy theories and increase public health app adoption.

We draw on theoretical insights on social influence and conspiracy beliefs to reveal how changes in received WOM on public health apps change conspiracy beliefs. We examine changes in WOM and conspiracy beliefs over time to account for the dynamics of social interactions. We posit that a change in the extent to which individuals receive negative WOM (NWOM) and positive WOM (PWOM) about a public health app from peers and experts will lead to a change in conspiracy beliefs, which, in turn, will affect app adoption and the individuals' WOM regarding the app. We further propose that the influence the changes of the different types of WOM exert on change in conspiracy beliefs substantially depends on the individuals' initial level of conspiracy beliefs. For instance, we predict that individuals with high initial conspiracy beliefs will discredit expert PWOM on a public health app based on the notion that the respective experts are a part of the conspiracy. Figure 1 summarizes our conceptual model.
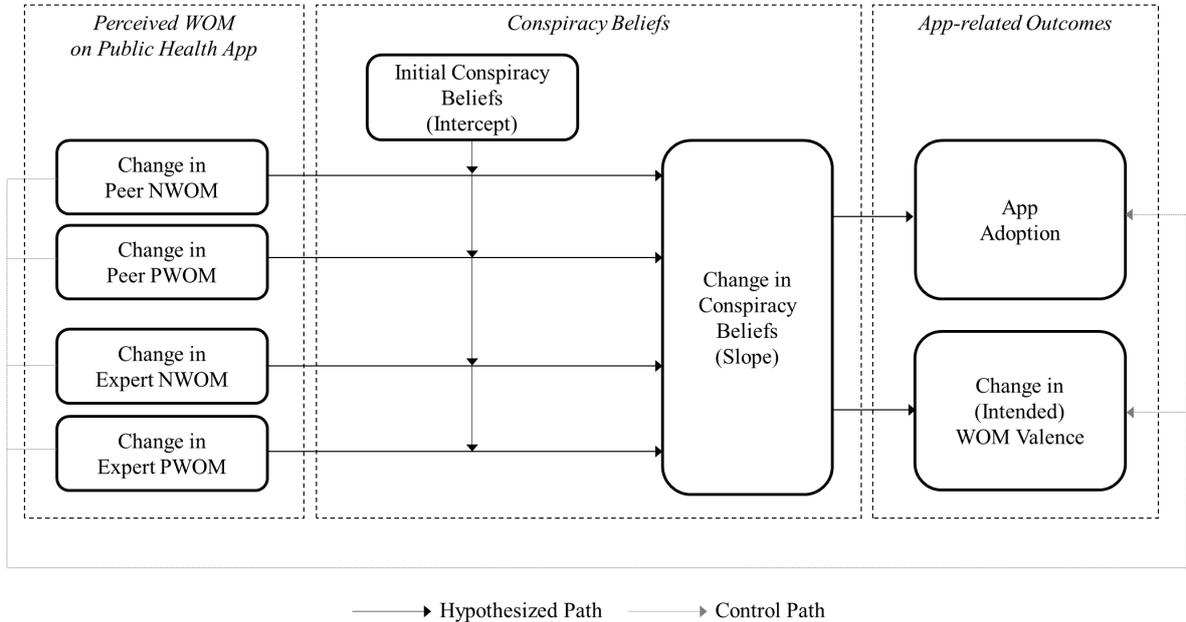
Figure 1 Overview of the conceptual model.

Our empirical analysis focuses on the German COVID-tracing app as an example of public health apps. We collected data using multiple surveys carried out before and after the app's release. Thereby, we obtained a unique multi-wave dataset ($n = 347$) that we analyzed using

mixed-effect growth-modeling and seemingly unrelated regressions. Results from the data analysis support our central predictions.

Overall, we make three substantial contributions to research on public health apps, WOM, and conspiracy beliefs. First, we complement extant research that identified perceived benefits and privacy concerns as central factors of public health app adoption by showing that conspiracy beliefs substantially inhibit app adoption. (1) Individuals showing increasing conspiracy beliefs are less likely to adopt public health apps. (2) Initial conspiracy beliefs affect how individuals interpret WOM on public health apps and thus indirectly influence app adoption. When marketing public health apps, health agencies have to consider how contemporary conspiracy beliefs could affect app adoption.

Second, we highlight that health agencies should employ WOM marketing to reduce conspiracy beliefs and increase public health app adoption. However, they must consider the consumer's initial conspiracy beliefs. Thus, although the dissemination of expert PWOM on public health apps is useful in preventing the development of conspiracy beliefs (i.e., when conspiracy beliefs are still low), it is ineffective in reducing conspiracy beliefs among firm conspiracy believers. Among individuals with substantial initial conspiracy beliefs, WOM by peers contradicting conspiracy theories (i.e., PWOM on public health apps) effectively reduces conspiracy beliefs. Hence, when addressing consumer segments that show high levels of conspiracy beliefs and who are generally opposed to public health app adoption, marketing campaigns should rather encourage peer-to-peer PWOM (e.g., by providing shareable content).

Third, this research improves the understanding of the spread of conspiracy beliefs. We show that individuals receiving peer NWOM on a public health app increasingly believe in conspiracy theories and, as a consequence, spread more NWOM on the app and thus spread conspiracy beliefs. With an increasing number of group members adopting and spreading conspiracy beliefs, social pressure to adopt conspiracy beliefs mounts, leading to a self-reinforcing loop characterized by a further spread of conspiracy beliefs. This mechanism also constitutes a substantial social barrier upholding conspiracy beliefs. Breaking this barrier and reaching groups with deeply entrenched conspiracy beliefs is a critical challenge for governmental agencies.