Is your phone really listening to your conversations? Well, turns out it doesn't have to

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Have you ever chatted with a friend about buying a certain item and been targeted with an ad for that same item the next day? If so, you may

have wondered whether your smartphone was "listening" to you.

But is it really? Well, it's no coincidence the item you'd been interested in was the same one you were targeted with.

But that doesn't mean your device is actually listening to your conversations—it doesn't need to. There's a good chance you're already giving it all the information it needs.

Can phones hear?

Most of us regularly disclose our information to a wide range of websites and apps. We do this when we grant them certain permissions, or allow "cookies" to track our online activities.

So-called "first-party cookies" allow websites to "remember" certain details about our interaction with the site. For instance, login cookies let you save your login details so you don't have to re-enter them each time.

Third-party cookies, however, are created by domains that are external to the site you're visiting. The third party will often be a marketing company in a partnership with the first-party website or app.

The latter will host the marketer's ads and grant it access to data it collects from you (which you will have given it permission to do—perhaps by clicking on some innocuous looking popup).

As such, the advertiser can build a picture of your life: your routines, wants and needs. These companies constantly seek to gauge the popularity of their products and how this varies based on factors such as a customer's age, gender, height, weight, job and hobbies.

By classifying and clustering this information, advertisers improve their

recommendation algorithms, using something called recommender systems to target the right customers with the right ads.

Computers work behind the scenes

There are several machine-learning techniques in artificial intelligence (AI) that help systems filter and analyze your data, such as data clustering, classification, association and reinforcement learning (RL).

An RL agent can train itself based on feedback gained from user interactions, akin to how a young child will learn to repeat an action if it leads to a reward.

By viewing or pressing "like" on a social media post, you send a reward signal to an RL agent confirming you're attracted to the post—or perhaps interested in the person who posted it. Either way, a message is sent to the RL agent about your personal interests and preferences.

If you start actively liking posts about "mindfulness" on a social platform , its system will learn to send you advertisements for companies that can offer related products and content.

Ad recommendations may be based on other data, too, including but not limited to:

- other ads you clicked on through the platform
- personal details you provided the platform (such as your age, email address, gender, location and which devices you access the platform on)
- information shared with the platform by other advertisers or marketing partners that already have you as a customer
- specific pages or groups you have joined or "liked" on the platform.

In fact, AI algorithms can help marketers take huge pools of data and use them to construct your entire social network, ranking people around you based on how much you "care about" (interact with) them.

They can then start to target you with ads based on not only your own data, but on data collected from your friends and family members using the same platforms as you.

For example, Facebook might be able to recommend you something your friend recently bought. It didn't need to "listen" to a conversation between you and your friend to do this.

Exercising your right to privacy is a choice

While app providers are *supposed* to provide clear terms and conditions to users about how they collect, store and use data, nowadays it's on users to be careful about which permissions they give to the apps and sites they use.

When in doubt, give permissions on an as-needed basis. It makes sense to give WhatsApp access to your camera and microphone, as it can't provide some of its services without this. But not all apps and services will ask for only what is necessary.

Perhaps you don't mind receiving targeted ads based on your data, and may find it appealing. Research has shown people with a more "utilitarian" (or practical) worldview actually prefer recommendations from AI to those from humans.

That said, it's possible AI recommendations can constrain people's choices and minimize serendipity in the long term. By presenting consumers with algorithmically curated choices of what to watch, read and stream, companies may be implicitly keeping our tastes and lifestyle

within a narrower frame.

Don't want to be predicted? Don't be predictable

There are some simple tips you can follow to limit the amount of data you share online. First, you should review your phone's app permissions regularly.

Also, think twice before an app or website asks you for certain permissions, or to allow cookies. Wherever possible, avoid using your social media accounts to connect or log in to other sites and services. In most cases there will be an option to sign up via email, which could even be a burner email.

Once you do start the sign-in process, remember you only have to share as much information as is needed. And if you're sensitive about privacy, perhaps consider installing a virtual private network (VPN) on your device. This will mask your IP address and encrypt your online activities.

Try it yourself

If you still think your phone is listening to you, there's a simple experiment you can try.

Go to your phone's settings and restrict access to your microphone for all your apps. Pick a product you know you haven't searched for in any of your devices and talk about it out loud at some length with another person.

Make sure you repeat this process a few times. If you still don't get any targeted ads within the next few day, this suggests your phone isn't really "listening" to you.

It has other ways of finding out what's on your mind.

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