

# Project yourself and perceive others online

Initial insights on presence and awareness cues

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# Executive summary

- **This report introduces the concept of “Presence and Awareness Cues (PAACs)”**, which provides a systematic approach to understanding how we project ourselves and notice others in mediated interactions.
- Based on a survey of more than 18,000 respondents, we find that **~90% of consumers across the globe use PAACs** within communications and social media applications.
- The survey results further suggest that **consumers with metaverse use experience are more avid users of PAACs, but also show stronger inclination to avoid signaling their presence and awareness in certain scenarios.**
- On average, **all consumers expect an increase in such PAACs avoidance behavior as the metaverse technology adds more variety and specificity to PAACs** in the near future.
- These results can be interpreted as **a starting point for further research and debate required within the emerging standardization of the metaverse.**

## INTRODUCTION AND CONTEXT

- In face-to-face (F2F) interactions, we are usually quite well aware of what the respective other(s) can perceive about us. In fact, we (more or less) competently manage what information we transmit including through our body language and various other cues. These practices are shaped by cultural, normative, and individual circumstances.
- In the world of mediated communication, we have developed surrogate signals of presence and awareness that enable an albeit reduced assessment of the status of our interlocutors.
- Now, as we are on the brink of the metaverse, we find ourselves at the crossroads of implementing a potentially complex collection of mediated signals, which will outperform human senses in F2F supported by technologies such as artificial intelligence (AI). However, little research has addressed the pressing question of whether we are ready for this development, or which steps are required to moderate it.
- These considerations form the starting point for this short report. With little prior existing research on the topic, this report is the first to point to this issue and support it with empirical data.
- For this purpose, the present report draws on a uniquely large and varied sample of more than 18,000 respondents from six countries (China, France, Germany, Italy, the UK and the US).

# THE METAVERSE USHERS IN A NEW LEVEL OF PROJECTING OURSELVES AND NOTICING OTHERS, BUT DO WE WANT IT?

## Face-to-face interactions

In Face-to-face interactions (F2F), humans rely on a large variety of cues to project their own and notice others' presence and awareness. Starting with identifying people in one's perimeter of (potential) interaction over recognizing who among them is able and willing to interaction to the interaction itself, these cues influence our behavior and emotional state. Various cultural, normative, and individual circumstances shape which of these cues we perceive and employ how and for which purpose. However, our use of these cues remains bounded by physical and temporal restrictions as well as human nature.

By means of augmented reality (AR) superhuman abilities in signaling and sensing will leak into F2F interactions and may change them profoundly.

## Mediated interactions (selected examples)

Mediated interactions require a set of cues that fulfil similar signaling for presence and awareness. With technological progress these cues have enabled us to overcome some of the physical and temporal limitations associated with F2F interactions

### Busy signals

Even the earliest telephones offered this kind of cue allowing the caller to understand the availability of the receiving end remotely.

### Reception notices

Starting with analogue postal and telegraph services, notices of successful message receipt have been implemented allowing us to understand if and when a certain message has reached its recipient.

### Read receipts

The emergence of digital messaging applications enabled cues that inform the sender about if and when the recipient has opened and likely read the message.

### Online status

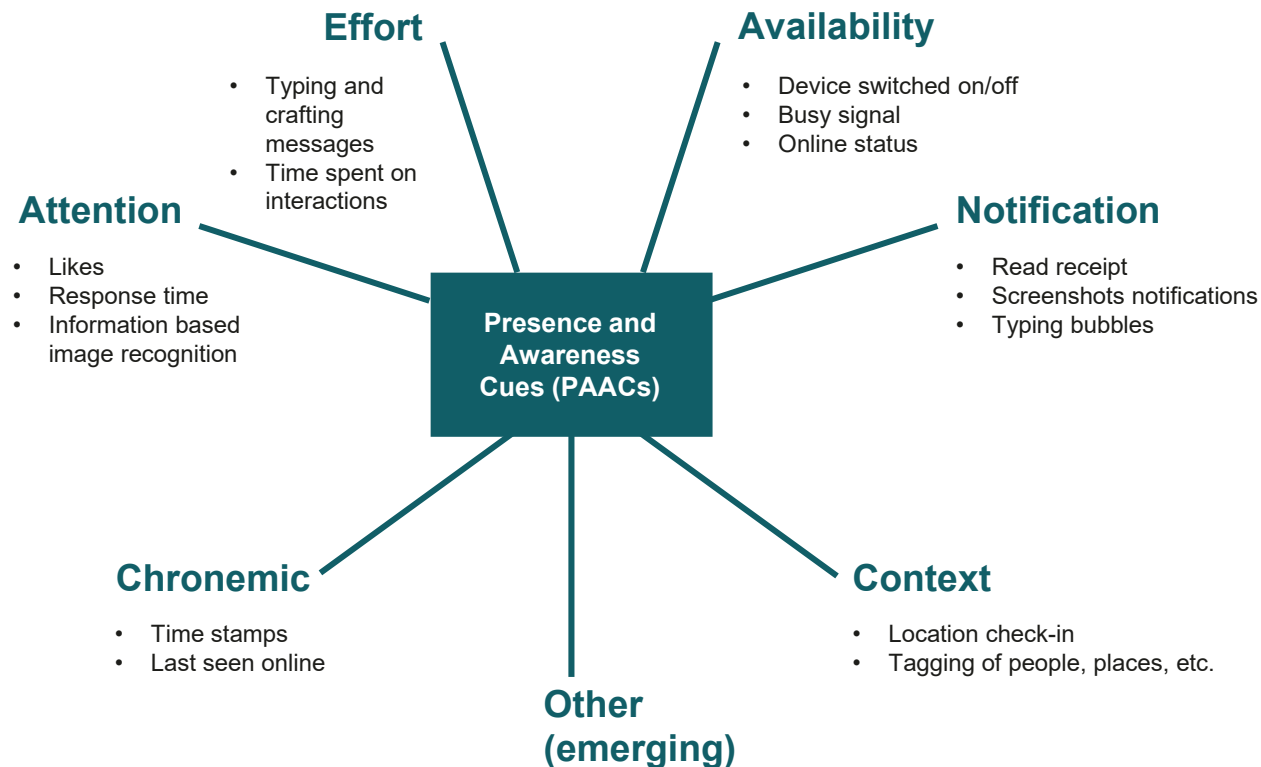
As DSL enabled a more continuous internet experience, online status information became a feature of various online services equipping us with perpetual remote awareness about others as well as options to project our own availability (for selected groups of others).

### Metaverse

The metaverse will usher in a completely new level of control over our presence signaling and the ways in which we can become aware about others as well as the current emotional state shaped by artificial intelligence (AI) analysis and infinitely manipulatable virtual environments.

⇒ This report **introduces the concept of "Presence and Awareness Cues (PAACs)** as a systematic approach to identify and understand such technology-enabled ways of projecting ourselves and noticing others in mediated and F2F interactions. We furthermore **provide initial empirical evidence highlighting the challenge to get PAACs right in the metaverse** to make it a success with consumers.

# A SYSTEMATIC CONCEPT TO CAPTURE AND UNDERSTAND SUCH DIGITAL CAPABILITIES – “PRESENCE AND AWARENESS CUES (PAACs)”



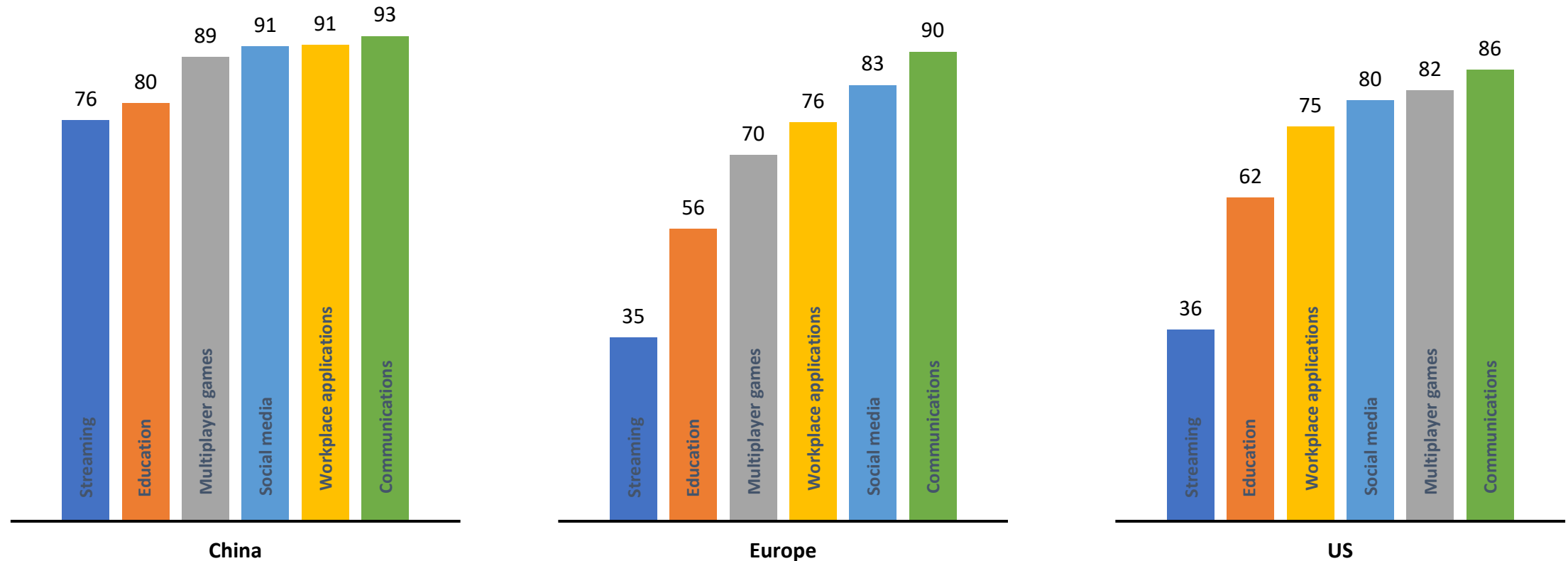
## PAACs differ from similar cues in F2F interactions:

- **Sticky:** PAACs often create a persistent record
- **Manipulatable:** Users make specific choices about if, when, and how to use PAACs
- **Targeted:** PAACs afford individualized signals for specific audiences
- **Augmented:** Users can access aggregated or interpreted information about others based on PAACs
- **Covert:** Users may not be fully aware, or have full control over which PAACs information is being shared about them.

⇒ The empirical research conducted for this report **establishes the importance that users of digital services attach to PAACs** and focuses on the aspects of **(1) manipulation of PAACs and (2) augmented information drawn from PAACs** in current services. We further explore likely **reactions by consumers to more pervasive PAACs in the metaverse.**

# FOR COMMUNICATIONS AND SOCIAL MEDIA DIGITAL APPLICATIONS, APPROXIMATELY 90% OF CONSUMERS NOTICE PAACS

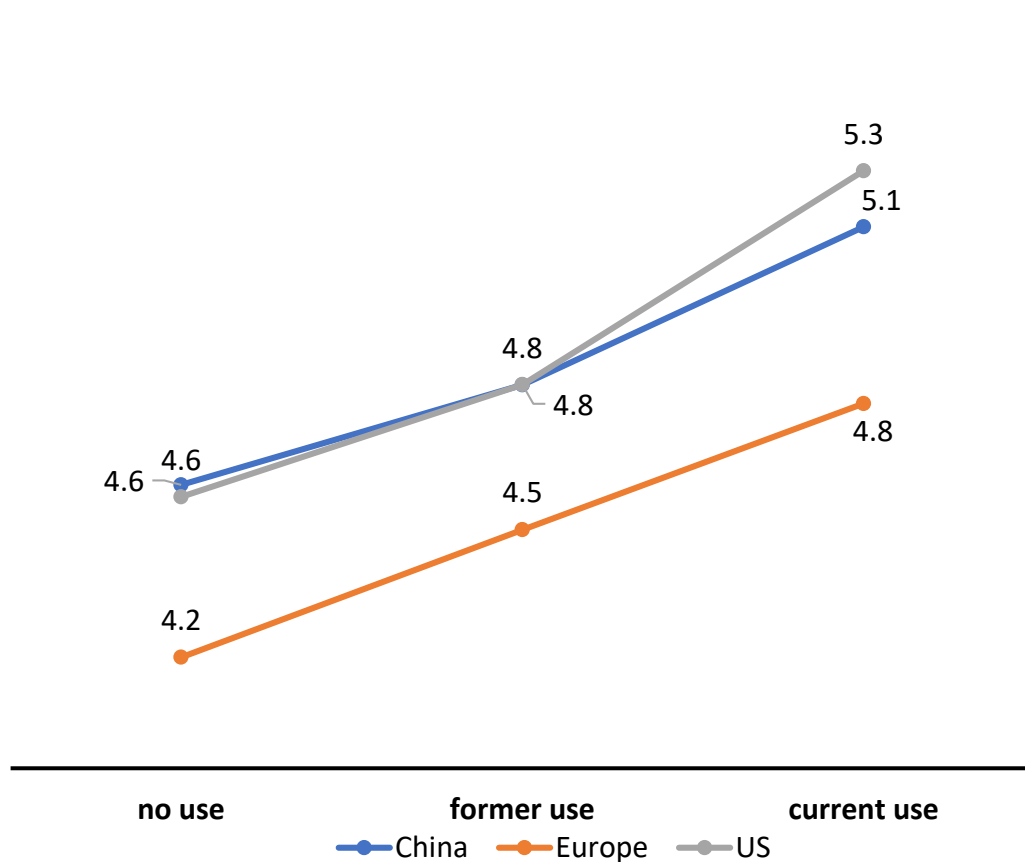
Share of consumers who notice PAACs at least sometimes across six selected categories of digital applications in %<sup>1</sup>



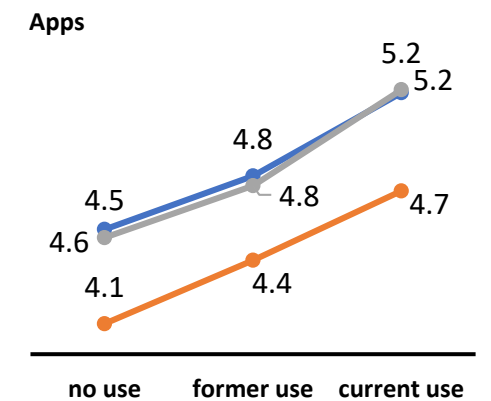
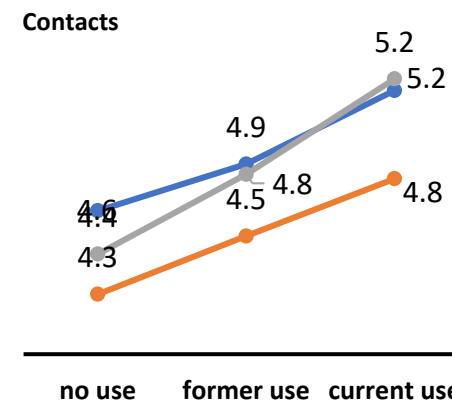
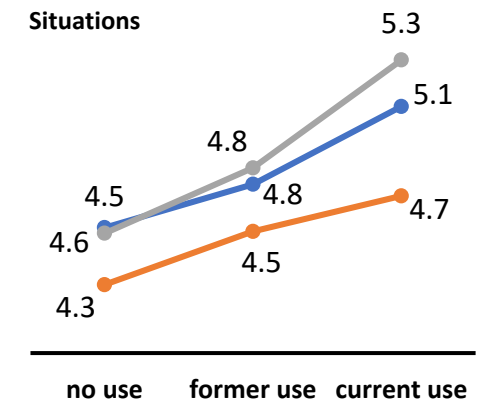
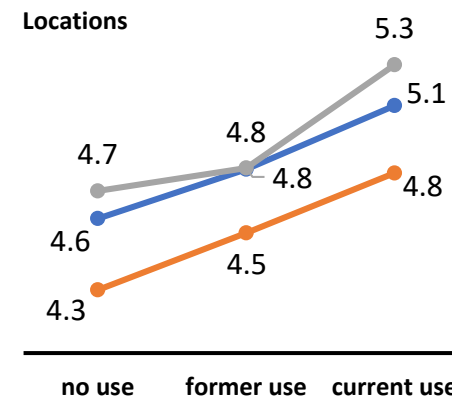
Legend: 1 n (China) = 3,007; n (Europe – FR, DE, IT, UK) = 12,268; n (US) = 3,083; in percent rounded.

# METaverse EXPERIENCE DRIVES AVOIDANCE OF PRESENCE AND AWARENESS SIGNALING

PAACs avoidance index by metaverse use experience<sup>1</sup>



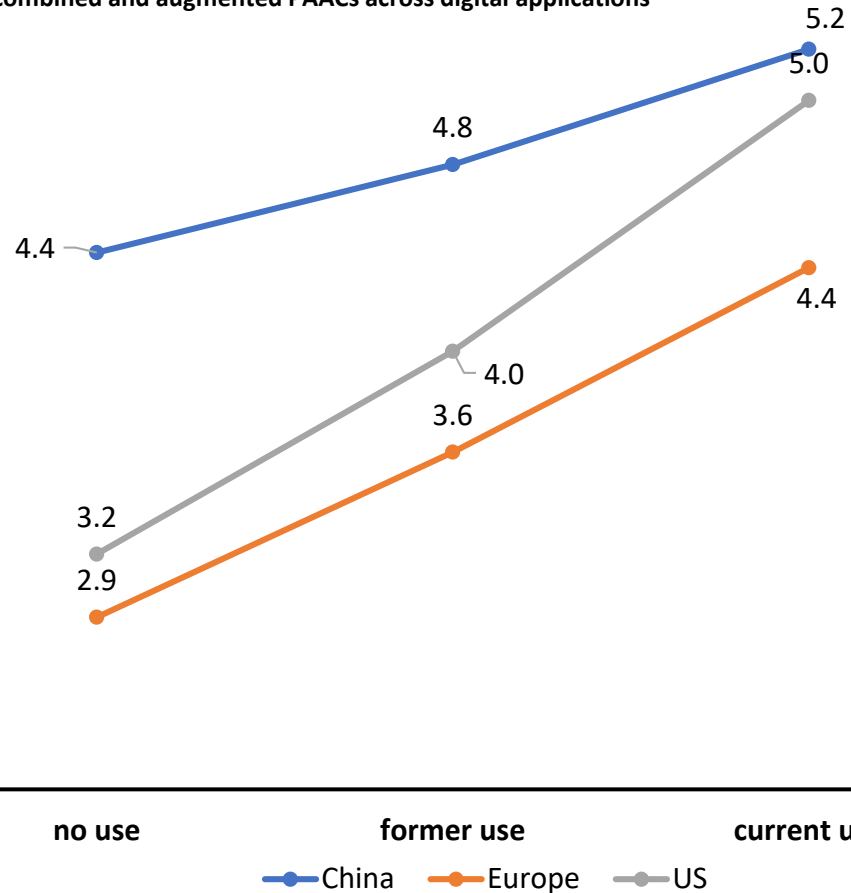
PAACs avoidance index for specific contexts by metaverse use experience



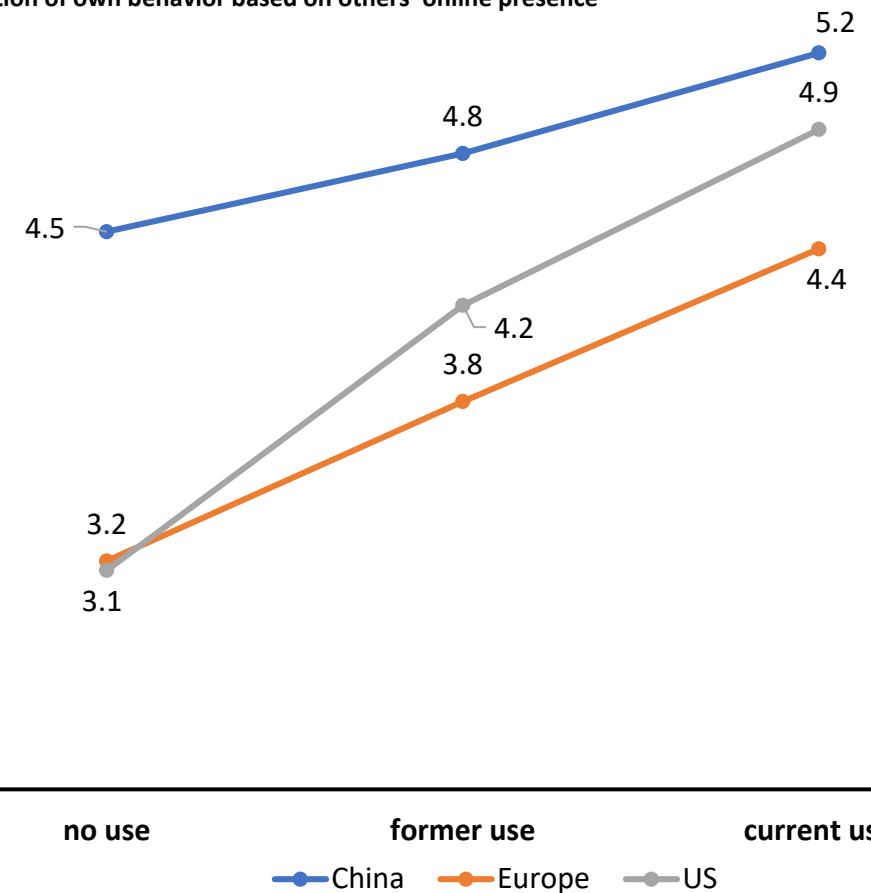
**Legend:** 1 Avoidance index: Average score of respondents' stated behavior as regards switching off, circumventing, or otherwise avoiding to signal their presence or awareness for selected (1) situations, (2) contacts, (3) locations, and (4) apps in the respective service category on the digital services they stated to have used in the four weeks prior to the survey (the list featured (1) communications, (2) social media, (3) workplace applications, (4) multiplayer games, (5) education, and (6) streaming); Min = 1; Max = 7, n (China) = 2,574; n (Europe – FR, DE, IT, UK) = 7,902; n (US) = 2,015; Tukey HSD p<.01 for all within region/country differences; rounded. Metaverse use experience refers to respondents who no, former, and current use of AR/VR devices (at least one).

# METaverse EXPERIENCE LEADS TO MORE INTERPRETATION AND ALTERATION OF ONE'S OWN BEHAVIOR BASED ON OTHERS' PAACS

Use of combined and augmented PAACs across digital applications<sup>1</sup>



Alteration of own behavior based on others' online presence<sup>2</sup>



**Legend:** 1 Average agreement with the statement "For contacts with whom I am connected across several online services and apps, I get a good sense of their whereabouts and routines by combining the information I learn about them in each individual service or app" 1 = "Strongly disagree", 7 = "Strongly agree". 2 Average agreement with the statement "I alter my behavior based on the information I received about other users who I am aware are online at the same time as I am" 1 = "Strongly disagree", 7 = "Strongly agree". ; n (China) = 3,007; n (Europe – FR, DE, IT, UK) = 12,268; n (US) = 3,083; Tukey HSD p<.01 for all within region/country differences, rounded. Metaverse use experience refers to respondents who no, former, and current use of AR/VR devices (at least one).

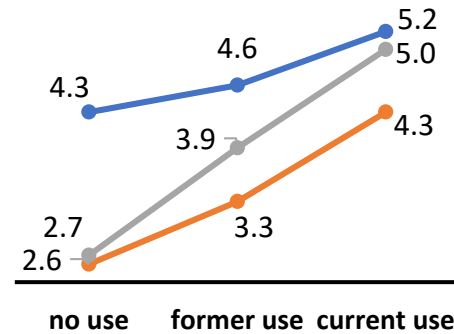


# METaverse USERS ARE KEEN TO BROADCAST AND RECEIVE MORE PAACs; WHILE ALL EXPECT TO RESTRICT THEIR SHARING OF PAACs

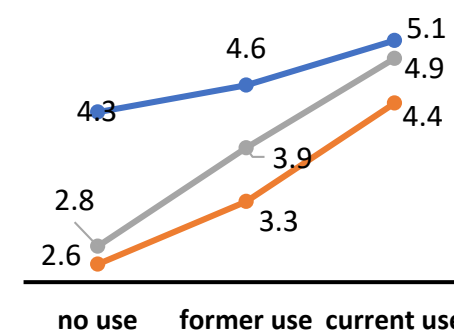
Attitudes towards future PAACs scenarios by metaverse use experience<sup>1</sup>

Referring to the respondent's PAACs

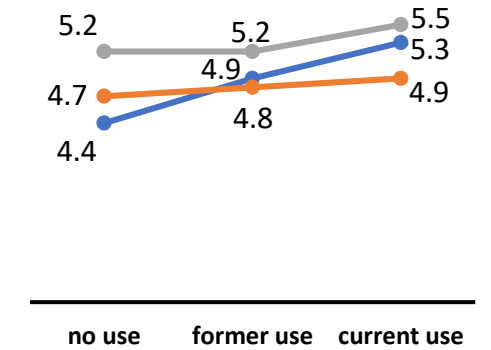
Broadcast greater variety of PAACs about me



Broadcast more specific PAACs about me



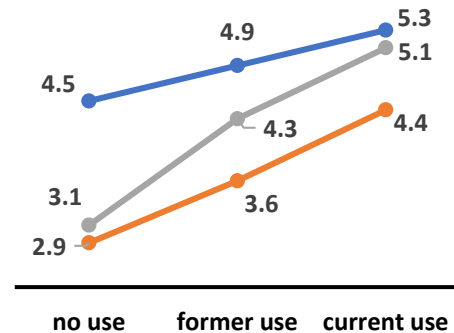
Expect myself to become more restrictive on PAACs



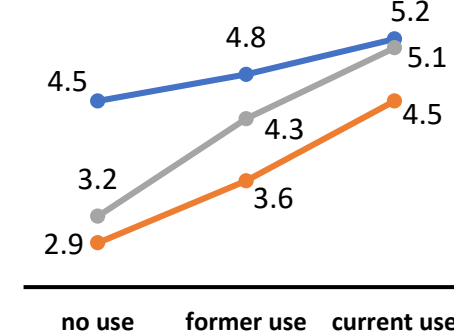
China Europe US

Referring to others' PAACs

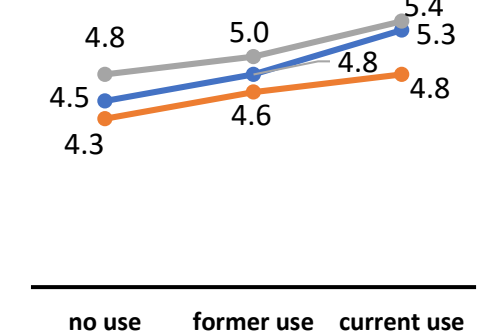
Receive greater variety of PAACs about others



Receive more specific PAACs about others



Expect others to become more restrictive on PAACs



**Legend:** 1 Average agreement on a Likert-like scale ranging from 1 = "Strongly disagree" to 7 = "Strongly agree" for the statements: (1) "I would welcome a greater variety of cues available about [others'/my] current availability, awareness, and actions.", (2) "I would welcome new cues that provide [me/others] with more specific information about [others'/my] current availability, awareness, and actions.", and (3) "I would expect [others/myself] to become more restrictive in sharing information about [their/my] current availability, awareness, and actions.", n (China) = 3,007; n (Europe - FR, DE, IT, UK) = 12,268; n (US) = 3,083; Tukey HSD p<.01 for all within region/country differences referring to (1) and (2), p<.01 for all within China differences for (3) and p<.05 for within Europe differences between current and no use as well as former use and no use for expectations about others, no statically significant differences for expectations about own behavior, for the US p<.05 for all expect former versus no use in both scenarios, rounded. Metaverse use experience refers to respondents who no, former, and current use of AR/VR devices (at least one).

# CONCLUSIONS, RECOMMENDATIONS, AND OPEN QUESTIONS

- Our **results underline the importance of PAACs for consumers**, and in particular for those who already use advanced technologies enabling AR and VR environments.
- **Consumers feeling safe and in control** of how they project themselves and notice others in the metaverse **will be a central success factor** for the adoption of the associated technologies and services.
- As we move into metaverse, the increased variety and specificity of **PAACs should be taken into consideration when developing (soft) standards around the metaverse and its services**. Relevant issues to take account in such efforts should include:
  - **Reciprocity:** In shared augmented and virtual spaces should PAACs mimic the reciprocity of information that is common in F2F interactions?
  - **Filters:** How much distortion of reality and potential bias are we willing to accept?
  - **Aggregation, augmentation, and interpretation:** What may be the role of AI tools to collect, collate, and interpret PAACs for personal and corporate use?
  - **Advertising and monetization:** May PAACs be used for advertising targeting and other monetization scenarios?
  - **Right to be forgotten:** Should (records of) PAACs be deleted automatically or upon request?
  - **Information:** Should PAACs settings be visible for others?

# METHODOLOGY

<b>Method:</b>	CAWI: Computer Assisted Web Interview
<b>Sample size(s):</b>	n=18,358 (Germany n=3,073; Italy n=3,065; France n=3,078; China n=3,007; UK n=3,052; US n=3,083)
<b>Sampling time:</b>	2022/04/26 to 2022/05/09
<b>Length of interview:</b>	The median length of interview varied between 21 and 24 minutes depending on the country.
<b>Sampling frame:</b>	The sample type is a non-probability sample recruited and stratified on basis of representative quota distributions (quota sample).
<b>Sampling procedure:</b>	Using YouGov's proprietary sampling technology, quotas are framed based upon the census or profile of the required population in the beginning. This frame is the basis on which the sampling software controls the flow of members into each survey. The sampling software randomly selects from the available panel, and allocates to surveys according to the quotas set. YouGov's sampling software includes a router. This removes the potential for self-selection on surveys, and increases the ability to deliver lower incidence samples within a short time frame. Panelists receive an invitation email containing a survey link. When they access the link the router checks against quotas on all live surveys and allocates them to a survey for which they qualify. Thus, panelists are not invited to a specific single survey, reducing the risk of early response bias, social desirability or other motivational biases.
<b>Survey pretest:</b>	For testing functionalities, the online survey was soft launched from 2022/04/25 to 2022/04/26. On the basis of the results, little adjustments were implemented. Respondents from the soft launch were removed from the final sample.
<b>Questionnaire:</b>	The researcher provided the master questionnaire in English. YouGov reviewed the questionnaire and translated it into the local languages required for the target countries.
<b>Data preparation and analysis:</b>	The survey data was processed by YouGov and provided in a SPSS data set. Incomplete cases were removed from the data set. Cases from the pretest as well as cases with duplicate cookie ids were removed. Analyses were done in R.
<b>Disclaimer:</b>	The survey sampling was funded by Huawei Technologies Co. Ltd. in Shenzhen, China. The research presented here was conducted fully independent by the author. All opinions expressed herein are solely the author's current opinions and do not reflect the opinions of Huawei and its affiliates.

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Since 2017, Anna Schneider is Professor of Business Psychology. Her research interests and teaching revolve around the impact of digitalization on consumer behavior, and in particular how people communicate and interact with emerging technology. Anna is a member of various research associations and sits on the scientific board of the Wissenschaftliches Institut für Infrastruktur und Kommunikationsdienste (WIK) – a renowned communications and internet policy think tank. Drawing on more than 20 years of hands-on experience in market research she regularly advises public and private organizations on surveys as well as qualitative research projects.