



Selected Papers of #AoIR2017:  
The 18<sup>th</sup> Annual Conference of the  
Association of Internet Researchers  
Tartu, Estonia / 18-21 October 2017

## **POSTHUMAN PUBLICS: EMERGING RESEARCH IN HUMAN-MACHINE COMMUNICATION**

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### **Panel overview**

In both its academic and lay uses, the word “public” has referred to “people,” and has done so for centuries (Oxford English Dictionary, 2017). Publics first assembled together in physical spaces and then in digital spaces (e.g., Rheingold, 2001), and as many AoIR scholars have documented, technology has played an integral role in the formation, evolution, and dissolution of publics (e.g., Papacharissi, 2014).

Suggested Citation (APA): Banks, J., Edwards, A., Edwards, C., Guzman, A., Jobin, A., Lewis, S. C., Spence, P., & Westerman, D. k. (2017, October 18-21). *Posthuman publics: Emerging research in human-machine communication*. Panel presented at AoIR 2017: The 18<sup>th</sup> Annual Conference of the Association of Internet Researchers. Tartu, Estonia: AoIR. Retrieved from <http://spir.aoir.org>.

In this panel, however, we look at a different role for technology in relation to publics, chiefly when information and communication technologies themselves gain increased agency, transitioning from things we communicate *through* to social actors we communicate *with*.

From an Aristotelian perspective (c. 350 B.C./1907), publics of varying scale emerge when speech (or *logos*) binds people together. How might publics emerge when some interlocutors are not *people*, exactly, but other types of social agents? In particular, how might interactions among human and machine agents contribute to the composition and dynamics of publics, especially as individuals come to identify as (and with) publics through such dyadic interactions? As digital interlocutors (such as Siri and Alexa, among other popular communicative agents) come to “stand in” for people in communication contexts, how do such interactions—i.e., human-machine communication (HMC)—reveal publics that are not entirely (or even mostly) human in character? Moreover, what do these shifts in the construction of publics mean for how publics convene and coordinate, in ways transparent or opaque? These questions become increasingly important as social machines—in particular, networked machines—become key actors in contemporary life.

This panels seeks to explore these questions at individual, dyadic, and institutional levels, attending to direct communications among various human and technological agents. In particular, this panel includes four papers reporting empirical findings with implications for the emergence of publics through human-machine communication. Paper 1 presents data from a study examining how social machines may be *individually perceived* as moral agents, and how that moral agency may beget senses of interpersonal attraction and trust across task-, social-, and play-focused interactions. Paper 2 builds on work suggesting that humans prefer and expect human-human dyadic communication; it presents findings from a study of how humans draw on familiar scripts for novel *human-robot interactions* and deal with expectancy violations. Paper 3 moves beyond individuals and dyadic interactions to address commercial dynamics in the emergent of sociotechnical publics, as advertisers make sense of opaque algorithms and translate them toward client service. Finally, Paper 4 addresses artificial intelligence in the context of journalism, analyzing 60 years’ worth of trade-press discourse to explain how machines have been framed in relation to news production and distribution—and how such frames may correspond with different assumptions of how publics, of various kinds and configurations, might engage with news.

Together, these reports offer empirical data with implications for better understandings of how sociotechnical publics may emerge from—and be hindered by—perceptions of, interactions among, and representations of humans and machines.

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## **PANEL PAPER 1:**

### **TOWARD A POSTHUMAN PUBLIC: PERCEIVED MORAL AGENCY AND TRUST IN SOCIAL MACHINES -Jaime Banks**

Feelings of trust are understood to be central to whether humans engage social technologies (Hancock et al., 2011)—from spam and chatbots to digital assistants and consumer robots. Current perspectives on human-machine trust are rooted in assessments of the *functional* reliability of the machine as a tool for human ends—that is, faith that the machine will perform its assigned tasks. Notably, however, social machines are increasingly designed to go beyond mere tool-oriented tasks to engage in interpersonal relational tasks. For instance, the upcoming social robot “Buddy” is touted as a companion robot that “connects, protects, and interacts” with families, runs on an “emotion engine,” and is said to democratize robotics through its open source platform (Blue Frog Robotics, n.d.). Such machines may enmesh human understandings of how to engage technologies with those associated with engaging humans (Spence, Westerman, Edwards, & Edwards, 2014). That such machines are designed for social interaction calls to question the ways that human adopters may (not) see them as social agents, and so trust them according to human social standards. In other words, to what extent do feelings of trust in machines rely on the assessments of *social* reliability? Core to this reliability is the perception of moral agency—the degree to which a machine is seen as having a moral system, acting based on that system, and taking responsibility for its actions (Banks, 2017)—which may fluctuate based on the emotions and reasoning inherent to functional and social tasks (cf. Greene & Haidt, 2002).

Building on emerging work in this domain (Banks, 2017) linking the perceived moral agency of social machines to feelings of interpersonal trust and attraction, this paper reports initial findings of a study on how functional and social reliability may coalesce in a human-machine interaction context that requires one or both forms of reliability. Specifically, the study experimentally explored the phenomenology of an interaction in which human individuals ( $n = 20$ ) were asked to engage in one of three types of short interactions with the social robot “Cozmo” (Anki, n.d.). Participants first completed an online survey with demographic questions, as well as assessments of existing attitudes

toward social machines, in general. Following, they came into a lab environment and were randomly assigned to engage in a task interaction (in which the robot will take commands, e.g., following control commands to navigate an obstacle course), a social interaction (in which the robot will engage in a friendly exchange, e.g., having a brief conversation via a Wizard-of-Oz arrangement), or a playful interaction (which requires both task and social reliability, e.g., playing a game of keepaway). Following the interaction, subjects participated in a semi-structured interview exploring their experience with the robot. The interview first attended to first impressions, feelings about the interaction, and strategies for interaction before advancing to questions about agentic functioning, perceptions of morality, and broad questions of trust in relation to the interaction context and future similar interactions. Interview data was subjected to emergent thematic analysis (Braun & Clarke, 2014) to identify patterns within and across conditions.

Initial findings suggest that the interaction context does play a role in the perception of machine moral agency. This engaging in undirected social interaction attended to Cozmo's emotional expressiveness and trying to determine how it functioned; those in the directed task condition focused on potential morality through sensing and learning, as well as on the robot's 'obeying' of commands and potential utility in their lives; those in the play condition focused on nonverbal responses to win/loss game outcomes as cognitive anchors for Cozmo's potential morality (i.e., he responds poorly to losing, suggesting he knows losing is bad, therefore he may be able to understand that some things are bad). Overall, most participants suggested they didn't *think* Cozmo was a moral being but offered scenarios in which he could possibly be. Overall, most participants suggested that they would trust Cozmo in social, task, and play contexts, although in a limited fashion; some suggested that trust in the robot would be similar with trust in a person—they would have to spend time with it first.

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## **PANEL PAPER 2:**

### **WILL THE HUMAN-TO-HUMAN INTERACTION SCRIPT HOLD?: EXAMINING INITIAL INTERACTIONS BETWEEN HUMANS AND SOCIAL ROBOTS**

**-Autumn Edwards, Chad Edwards, David K. Westerman, & Patric R. Spence**

Across a variety of contexts and relationships, people increasingly encounter digital interlocutors and machine agents “standing in” for other people in communication processes. Instances of human-machine communication (HMC) often involve interaction between people and social robots or automated software bots. In these situations, social robots are “not a medium *through which* humans interact, but rather a medium *with which* humans interact” (Zhao, 2006, p. 402, emphasis added).

Despite the increase in encounters with social robots, people generally assume that their communication partners will be other humans. Previous experimental communication research has demonstrated that individuals face greater uncertainty and anticipate less liking and social presence when they face an interaction with a social robot versus a human partner (Edwards, Edwards, Spence, & Westerman, 2016; Spence, Westerman, Edwards, & Edwards, 2014). The expectation of, and preference for, communication with another human has been termed the “human-to-human interaction script” (Edwards, Edwards, Spence, & Westerman, 2016; Spence, Westerman, Edwards, & Edwards, 2014). Importantly, both studies focused on individuals’ anticipated interactions with a partner. Spence and colleagues (2014) performed an experiment in which participants were simply told they would be interacting with either another person or a social robot. Edwards and colleagues (2016) incorporated a two-time measurement model to establish a baseline of communication expectancies and added visual priming of the conversation partner to eliminate individual variance linked to discrepant mental pictures of social robots or human beings. The results of the two studies provide evidence that people operate on the basis of a human-to-human interaction script that leads them to expect greater difficulty

relating to a robot. However, research has not yet examined two critical questions that would further test and elaborate the human-to-human interaction script: (a) do people remain more uncertain and experience less liking and social presence from a machine partner even *after* an initial interaction? And (b) to what extent do individuals employ the same communication scripts in an initial conversation with a social robot as in an initial conversation with another person?

Kellerman (1992) argued that communication is largely an automatic process of using social scripts. Cognitive script theory (Abelson, 1976, 1981; Schank and Abelson, 1977) maintains that people use mental representations, or cognitive scripts, of everyday events that influence perceptions and actions when making choices regarding actions in the future. "Right or wrong, people rely on social models (or fluidly switch between using a social model with other mental models) to make the complex behavior more familiar and understandable and more intuitive with which to interact. We do this because it is enjoyable for us, and it is often surprisingly quite useful" (Bezereal, 2003, p. 168). Scripts help specify what actions one will perform in a situation (Kollar, Fischer, & Hesse, 2006). New experiences allow people to develop more efficiency in their use of social scripts. In other words, the response to the new experience is incorporated as an update for the next time the script is needed.

Kellerman and colleagues found remarkable consistency in people's scripts for a first-time conversation with another student (95% consistency in topics and topic changes). Our recent studies, along with those of several other researchers (e.g., Kim, Park, & Sundar, 2013; Lee, Park, & Song, 2005; Lee, Peng, Jin, & Song, 2006; Park, Kim, & del Pobil, 2011), have extended the Media Equation and Computers are Social Actors (CASA) paradigm from their original application to computers to robots, to demonstrate that people view robots as real and engage robots with social perceptions and responses similar to those used with other humans. In an effort to reconcile the observed human-to-human interaction script with the larger predictions of CASA, this study will examine whether and to what extent those similarities apply to the content of scripts used in initial encounters between people and social robots. As intelligent machines grow in prominence, it will be increasingly important to identify how social scripts between humans and social robots will be formed and used (Powers & Kiesler, 2006).

We will present the results of an experiment designed to examine the similarities and differences in (a) the scripts individuals employ for a first interaction with a person versus a social robot and (b) their reactions in terms of uncertainty/expectancy effects, liking, and social presence.

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**PANEL PAPER 3:**  
**ADVERTISERS AND ALGORITHMS:**  
**TRANSLATING BETWEEN TRADITION AND TECHNOLOGY**  
**-Anna Jobin**

Much like in traditional media contexts, the advertising business is a key source of revenue in digital media industries, although its place and role within particular markets is highly variable. The specificities of digital advertising arise not only from the characteristics of the medium—namely access to an abundance of new metrics and the possibility of personalized targeting (Turow 2013) —but also from a modified industry structure that privileges vertical integration. As a consequence, digital platforms such as Facebook and Google provide user/usage data to online advertisers as well as all relevant software. Notably in search ads, Google holds a *de facto* monopoly position, supplying the relevant keywords, the keyword ratings (Lee 2010) as well as the algorithmic software to manage both. This paper looks at how online advertisers make sense of their interaction with unknown algorithms they professionally depend on from a sociological angle. Based on empirical data it suggests that their sensemaking is conditioned by their role as intermediaries between platforms and (potential) clients.

**Interacting with algorithms**

Computational systems have become pervasive, leading to invisible algorithms being entangled with many aspects of human life. As „cultural objects embedded and integrated within a social system“ (Cheney-Lippold 2011, p. 167) algorithmic codes and interaction therewith must be studied in the context of the lived world of the social actors. This paper takes a closer look at Google AdWords, a crucial subset of the company’s main revenue generating algorithmic system, and at the key users interacting with it: online advertisers. These advertisers—digital agencies, marketing managers, account planners etc.—are often overlooked, because the focus lies mostly on either ‘users’ or on ‘platforms.’ However, Google relies heavily on online advertisers and their specialized understanding of digital audience metrics as well as specific market logics to generate revenue. Although online advertisers often have specialized knowledge about Google AdWords, they interact with a dynamic algorithmic system mostly outside of their control. Their ads, co-created with Google AdWords algorithms, will be displayed to specific publics based on metrics provided by Google. Advertisers do not know the details of how the algorithms work, nor when they change, and they depend heavily on the information they are given by Google. This shows that online advertising is a result not only of knowledge and data, but also of a set of narratives by specific actors. In order to better understand interaction with algorithms it is therefore crucial to take into account what participating stakeholders make of it (cf. also Gillespie 2014). This paper presents an analysis of how advertisers interpret and make sense of unknown algorithms they professionally depend on.

**Method and analysis**

Because the interpretivist aim is to understand the meaning advertisers give to their actions, a qualitative approach based on semi-directive interviews has been deemed most coherent. It is crucial to note that 'advertisers' comprises a population of people with many different occupations, job titles and descriptions, and calling them 'advertisers' is a simplification. However, due to their common activity of interacting with Google AdWords algorithms their professional denomination is secondary for this study.

For the analysis of the interviews with advertisers, particular attention is given to aspects related to sensemaking on the one hand and categorizations on the other hand, both being, of course, related (Cornelissen 2012). Which categorizations are mobilized to create meaning? Are these categorizations shared, i.e. 'institutionalized', or do they vary greatly between individuals? Analyzing what people are referring to when they make sense of unknown algorithmic systems helps uncovering which 'meanings' have been institutionalized—and are, reciprocally, being institutionalized and legitimized through their taken-for-granted use. In what ways are people contributing to legitimize certain meanings or, on the contrary, questioning them? Understanding shared meanings reveals the lens through which people are invited to make sense of algorithms.

### **Translating automated systems for an outside public**

Based on these qualitative interviews, this paper shows that online advertisers perform crucial work for platforms because they have to translate between traditional advertising approaches and technological specificities for (potential) clients. They are intermediaries between dominant digital platforms and other publics and their narratives, and the discursive work they attempt to achieve, are indicative of the different publics they address. This is why, in some contexts, advertisers underline the existence of automated algorithmic systems whereas, in other contexts, they minimize the impact of such systems. These discursive strategies can be explained in view of the conclusion that online advertisers have to act as both experts and mediators.

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## **PANEL PAPER 4:**

# **WHAT ARTIFICIAL INTELLIGENCE MEANS FOR JOURNALISM AND ITS PUBLICS: LINKING HISTORICAL AND CONTEMPORARY DISCOURSE**

**-Seth C. Lewis & Andrea L. Guzman**

Algorithms and automation play a growing role in the production, distribution, and consumption of news, altogether shaping what publics understand about the world through news accounts. Perhaps typifying this development is the rise of automated journalism, or stories produced not by human authors but written by machines (Carlson, 2015; Montal & Reich, 2016). Indeed, algorithms are responsible for producing tens of thousands of stories that fill online news sites, even from leading news organizations such as the Associated Press. These news articles are limited mostly to topics that have structured data associated with them, such as sports results and financial earnings reports—events with algorithm-ready data from which to produce stories based on pre-formatted themes. But opportunities for automated augmentation grow apace: For many news companies, the question is not if but when and how content becomes automated (LeCompte, 2015).

But while automated journalism (sometimes called “robot journalism”) has received much attention at trade conferences and in recent research (e.g., Graefe, 2016; Linden, 2017), it is but one manifestation of artificial intelligence (AI) in journalism. Just as significant are related developments in machine-learning techniques for automatic filtering of social media content, algorithmically assembling news feeds, and personalizing news flows across platforms (e.g., see Thurman et al., 2016). Together, these developments in AI broadly—not merely in automation alone—complicate understandings about who (or what) is a journalist, and when, how, and why journalistic functions might be replaced or augmented by machines. Unlike previous instances of digital technology in journalism, artificial intelligence is distinct because it situates machines *in the role of humans*—that is, it does not enable human activity so much as ostensibly replace or redefine it.

### **Research questions and study purpose**

What is needed is a more historically grounded interpretation of AI in the context of journalism. How, if at all, has the journalism field, in its trade-press discourse, dealt with matters of AI—that is, of algorithms, automation, and related processes and products? Toward what purposes and in whose interests have such discursive constructions developed over time? And, in the present rush to developed automated forms of journalism, how is AI being articulated by various stakeholders, such as technology companies developing such tools on the one hand and editors and newsrooms engaged in deploying such tools on the other? Ultimately, given the public-facing role that journalism is believed to play in society, how is the role of *publics* positioned in the context of such conversations about algorithms, automation, and the future of news?

For example, how might distinct visions of AI in journalism correspond with different *visions of the public* (cf. Anderson, 2011), and thus different understandings of how publics, of various kinds and configurations, could and should engage with news at the intersection of human and machine.

## **Background: Toward quantification and automation in journalism**

AI, generally defined as encompassing the development of computing systems that perform tasks normally associated with humans, is linked to broader trends in data and society. In recent years, rapid advances in the collection, storage, and analysis of digital trace information have accelerated the study of human activity and expression via large-scale datasets (Kitchin & McArdle, 2016). These developments, in turn, have fueled the growth and influence of database-backed algorithms, or programmatic sets of rules that structure much of our mediated world: from what we see and experience on the likes of Facebook and Google (Gillespie, 2014), to how determinations are made about job prospects and loan applications (O’Neil, 2016).

This turn toward data-centric quantification—and algorithms and automation particularly as key modes of information production and circulation—is reflected in all media and information domains, but particularly so in journalism (Coddington, 2015). A forum of news editors worldwide has identified automated journalism as a top newsroom trend (Graefe, 2016), and technology providers across many countries are developing algorithms to deliver automated news in multiple languages (Dörr, 2015). From limited research, what we know so far about automated journalism is that audiences may not be able to discern between human- and robot-written news (Clerwall, 2014), and the consequences for journalistic labor, authority, and other professional issues require further study (Carlson, 2015). While automated journalism is not replacing human reporting in any significant way so far, developments in AI point toward emerging questions about the social role of journalism as a longstanding facilitator of public knowledge. What, in effect, does AI mean for journalism’s people and processes, norms and values, and community orientations and obligations?

Research has yet to explain not only *how* AI is being applied in journalism but *why*—around what definitions, in whose interests, and toward what purposes. Moreover, research is needed to link older conversations in this vein, from the earliest manifestations of automated printing and computerized journalism in the 1960s and 70s, with contemporary discussion about “robot reporters.”

## **Methods and analysis**

This paper takes up that task by qualitatively analyzing a large body of journalism trade-press discourse over a 60-year period, focusing on mentions, historically and contemporaneously, of artificial intelligence (e.g., algorithms, automation, robots/bots, machine learning, etc.) in the particular context of news production and distribution. Following Anderson’s (2013, p. 1005) call for “a sociological approach to computational journalism,” this paper uncovers the genealogy of discussion around AI as reflected across a range of sites and publications that embody the trade-press universe for journalism (cf. Powers, 2012), with an emphasis on how such technologies are

implicated in journalism's representations of and relationships with publics.

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