Experiences, sensemaking and attitudes towards algorithms in mediated communication: An integrative review of the literature

Algorithmic systems are increasingly important across many domains of public and private communication, including production and distribution of news, usage of entertainment, search for information and commercial products as well as social interactions. Many concerns have been raised about the challenges of algorithmic systems, including their biases and discrimination (e.g. Noble, 2018), transparency and accountability (e.g. Annany & Crawford, 2018). Consequently, public and scientific debates consider how to regulate algorithmic systems on the one hand (e.g. Elkin-Koren, 2020) and the need for algorithm literacy on the part of the users of these systems (e.g. Dogruel et al., 2022). The present contribution zooms into the latter and endeavors to integrate different perspectives and vocabularies in the growing field on user experiences and strategies in dealing with algorithms. Integrative reviews prove particularly valuable in emerging research fields as it helps assess, map and bridge existing literature (Torraco, 2005). Consequently, the current literature review sought to understand the current state of knowledge in relation to the processes through which individuals acquire knowledge about algorithms, and how we might formulate this concept of algorithm literacy.

Our systematic review, spanning peer reviewed academic papers in English from 2000 to July 2023 in social science and humanities (excluding fields like law and informatics), used an extensive list of search terms to explore various aspects of algorithm experiences and perceptions. We focused on articles where “algorithm” appeared within two words (NEAR/2) of terms like “literacy,” “knowledge,” “competence,” and many others in the abstract, title, or keywords. We considered empirical studies, reviews, and theoretical works. The review

centered on articles discussing algorithms in mediated communication, shaping how individuals and groups exchange messages through communication technologies.

From an initial Web of Science search, we identified 498 results, which were subsequently refined by removing duplicates and ineligible articles, resulting in a selection of 74 articles. Extending our search through forwards and backwards search within this pool, we uncovered an additional 56 relevant articles, yielding a total of 130 articles for our review. We conducted an in-depth full-text analysis of all 130 articles, coding them inductively to identify integrative themes forming the foundation of our framework (Cronin & George, 2020) based on descriptors such as underlying theories, research paradigms, applied methods, focal constructs, the functions of considered algorithmic systems, and their application domains.

The preliminary results show that literature review shows that scholarly work on the users' perspective towards algorithms and their practices has strongly increased since 2019. Conceptual work is by far less common than empirical work, with empirical articles favoring qualitative methods such as interviews, focus groups, ethnographic approaches, qualitative content analyses and participatory methods (54%), followed by quantitative methods such as surveys and experiments (21%).

The articles approach the users' perspectives on algorithms spanning from basic **awareness of algorithmic presence** (e.g., Powers, 2017) and progressing to examining **attitudes and emotions** related to aspects like algorithmic fairness and transparency (e.g., Araujo et al., 2020). Some delve into users' **intuitive explanations and beliefs**, often referencing folk theories and algorithmic imaginaries (e.g., Ytre-Arne & Moe, 2021). Others explore how users develop understanding through **practices** of consciously **interacting with algorithms** (e.g., Cotter, 2019). A smaller subset of articles examines users' sense of control,

decision-making ability, and power dynamics in algorithm-user interactions (e.g., Sundar, 2020). All of the former focus on subjective perceptions without benchmark assessments. A few articles address **algorithm literacy** explicitly, comparing user knowledge to presumed correct information and interactions (Dogruel et al., 2022). The limited research on algorithm literacy, despite public calls for it, reflects the challenge of defining a ground truth for opaque algorithms, hindering objective skill measurement. We also find an obvious lack of research on the outcomes of these different forms of algorithmic literacy – both in the normative and practical sense. Findings ways to assess and spell possible outcomes is a pertinent next step in this field of research.

Based on the review, we formulate a dynamic framework of experiential learning about algorithms and propose a future research agenda.

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