Challenges for Personal Behavior Change Research on Information Diversity

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Challenges for Personal Behavior Change Research on Information Diversity

J. Nathan Matias
MIT Center for Civic Media
jnmatias@mit.edu

Elena Agapie
Microsoft Research
eagapie@post.harvard.edu

Catherine D'Ignazio
MIT Center for Civic Media
dignazio@mit.edu

Erhardt Graeff
MIT Center for Civic Media
erhardt@media.mit.edu

ABSTRACT

Researchers have tested a variety of personal informatics systems to encourage diversity in the political leaning, geography, and demographics of information sources, often with a belief in the normative value of exposure to diverse information sources. Methods attempted have included information labeling of media sources, personalized metrics of reading behavior, personalized visualization of social media behavior, recommendation systems, and social introductions. Although some of these systems demonstrate positive results for the metrics they define, substantial questions remain on the interpretation of these results and their implications for future design. We identify challenges in defining normative values of diversity, potential algorithmic exclusion for some groups, and the role of personal tracking as surveillance. Furthermore, we outline challenges for evaluating systems and defining the meaningful social impact for information diversity systems operating at scale.

Author Keywords

Information diversity, personal informatics, behavior change

INTRODUCTION

Diversity of information and relationships, an important factor in collective intelligence [13] and democratic processes[8], have become a concern online, where social behaviors and personalization systems may tend to surround people with "filter bubbles" of likeness [14]. In response, personalized systems for information diversity track what a person reads or follows, provide feedback on the diversity of that information, and offer suggestions aimed at changing that person's awareness, attitudes, relationships, or habits [9][12][15][7]. Other systems connect users with people who hold diverse viewpoints [13]. Munson et al show that we can increase exposure to political news diversity through feedback on what information people already consume. Some systems focus on topical diversity, offering visualizations of topical reading habits [15] [18]. Other systems focus on geographic [5] and demographic diversity in information sources [8].

In this position paper, we raise design and evaluation challenges for personalized information diversity systems. We identify challenges in defining normative values of behavior change and the processes through which they are defined. We ask questions about who these systems are designed for and raise issues of algorithmic exclusion created by systems with simplistic definitions of diversity. Personal information systems gather detailed information about users, exposing them to surveillance and censorship risks. We invite discussion about the design and interpretation of evaluation for information diversity systems, whose goals are not easily quantified. Finally, we pose questions about the scale required for societal impact for these systems. Many of these challenges have implications beyond information diversity, and are applicable to the entire class of systems designed to support personalized behavior change.

CONTRIBUTION AND GOALS FOR THE WORKSHOP

All of the authors are involved in research on novel systems for information diversity. By participating in this workshop, we hope to provoke and facilitate lively conversation on the challenges we raise. We are especially interested to discuss these questions with researchers who examine systems for personal behavior change in contexts outside information diversity.

APPROACHES TO DEFINING NORMATIVE VALUES OF BEHAVIOR CHANGE

The motivations for much of the research on information diversity include normative values about the role of diverse voices and information in democracies. These values include the assumption that exposure to politically, geographically, or topically diverse information is a good. Communications researchers however have complicated this vision, arguing for the benefits of looking inward; marginalized communities often need to maintain their group identity while also participating in an ecosystem of media production that only sometimes interacts with the widest public [17].

Diversity as a concept is also in tension with personalization. Research systems for diversity tend to define diversity narrowly, using a single definition of diversity across the entire system. For example, the Balancer system uses left/right political diversity, the FollowBias [9] system uses gender diversity, and Mapping the Globe [5] uses geographic diversity. Alternative systems could offer readers choice on what kinds of diversity they seek. It is also possible to imagine systems that reduce the degree of personalization by offering greater control to marginalized groups to choose how they will be represented to that user.

Those who create, encode, and publish normative systems for behavior change exercise a strong and potentially invisible form of power over those who are the intended users of these systems. These system designers may not even realize that what they deem "improvements" represent significant normative stances. We identify two alternatives to this top-down approach. Participatory processes for creating and evaluating norms are a common need across this whole field. For example, in the field of health, food labeling norms are governed through an ecosystem of research, policy interventions, lobbyists, and civil society groups. Such process-oriented approaches stand in contrast to a second possibility: systems explicitly designed for user-initiated exploration and play, where the establishment and governance of norms may be inappropriate. This more playful approach is illustrated in projects like ShoutRoulette, where people of opposing views shout at each other over video chat [16], and the gastrodiplomacy of Conflict Kitchen, which serves food from countries the United States is in conflict with[4][6]. We welcome a rich discussion on governance processes across multiple domains of personal behavior change.

ALGORITHMIC EXCLUSION, FALSE DIVERSITY, AND CONTEXT COLLAPSE

Systems that use automated algorithms to enact a particular definition of diversity must choose what to omit as well as what to recommend. This exclusion could create a false sense of diversity. Users could become confident in a system's ability to recommend diverse viewpoints even while that system systematically excludes some critical perspectives.

Limitations in feature sets already contribute to algorithmic exclusion. For example, gender-oriented recommendation systems tend to interpret gender as a binary feature, since privacy concerns and limitations in available datasets discourage developers from attempting automated identification of LGBTQ voices [3]. In this case, systems that encourage one kind of diversity also risk further entrenching heteronormative values of gender identity. Likewise, algorithms that classify political leaning into binary categories can exclude points of view that represent voices outside of the political mainstream, amplifying existing disparities. Furthermore, systems that prioritize geographic diversity may not account for the complex diasporic flows of people and culture around the globe that do not fit neatly into administrative geographic boundaries.

Context collapse, which occurs when material from a particular community reaches readers who are not familiar with its context, is another risk of information diversity systems. At worst, these incidents can have strong repercussions for vulnerable or marginalized people; they can also inoculate users against the voices and discourse styles of groups they are unfamiliar with [10].

PRIVACY, SURVEILLANCE, AND CENSORSHIP

The right to privacy in reading behavior has been a long-standing value among librarians in the United States, who consider reading habits to be protected under the US Constitution [1]. Information diversity systems can require access to browsing histories, relationship networks, and interactions on social media. Since marginalized groups are often targets of state surveillance, information diversity systems can risk making vulnerable the very people they are ostensibly designed to support.

Commercial recommendation systems also often include measures for omitting illegal, risky, or uncomfortable speech. Systems designed to expose readers to a diversity of styles and voices are likely to face a greater number of these challenges than recommendation systems that seek to fit the preferences of the reader.

Issues of privacy, surveillance, and censorship are common across systems for personal behavior change. We are eager to add to this conversation from the perspective of speech rights.

EVALUATING SYSTEMS AND INTERPRETING RESULTS

Results on information diversity systems and early results from yet unpublished randomized trials have shown changes in media consumption activity after exposing readers to information about their media consumption and/or offering recommendations. It may be possible however that these results are a selection effect, that these systems are helpful only to a small number of people who are already receptive to diverse information. It's also

possible that studies on recommendation systems may simply be showing the effect of recommendations in general rather than increased interest or receptiveness toward diverse viewpoints.

We are interested to discuss experiment designs that can improve the clarity of results in the area of personal behavior change. We may need to position users in more exploratory, open-ended situations and develop evaluation mechanisms for complex, qualitative phenomena such as curiosity, reflection, and receptiveness to new information.

BEHAVIOR CHANGE AT SCALE
Information diversity systems often are motivated by societal visions that rely on the idea of individual behavior change at scale. For example, initiatives towards broadened political diversity are motivated by an interest in more diverse conversations during elections. In large democracies, very large numbers of users would need to become aware of diverse opinions to influence the political process. Evidence of large cumulative effects in voting behavior on Facebook offers hope that this kind of change is possible [2]. We invite discussion on the scale of interventions and effects necessary for behavior change at large scales.

Moreover, most information diversity systems are geared towards the individual as an atomic unit of society. We would like to challenge assumptions of individualism and invite discussion around what design changes might be made in this space towards information diversity systems for groups small and large. We argue that collective and community patterns of information diversity are even more relevant than individual patterns of information diversity behavior.

ABOUT J. NATHAN MATIAS
Nathan Matias is a PhD student at the MIT Center for Civic Media, a fellow at the Berkman Center for Internet and Society at Harvard, and co-investigator of the Space Team Research Initiative. Prior to MIT, he worked for SwiftKey, a personalized predictive text entry company, and Texperts, a large scale micro-work system that provided semi-automated Q&A answers to millions of customers via SMS. His Master's thesis focused on automated systems to foster gender diversity in the media, including personal informatics, news metrics, and crowd systems.

ELENA AGAPIE
Elena Agapie is a visiting fellow at Microsoft Research FUSE Labs and PhD student at University of Washington, Human Centered Design and Engineering starting Fall 2014. She received her MS in Computer Science from Harvard University. Her research at FUSE Labs focuses on creating tools to support citizen journalists in doing better reporting. Prior to this she did work in information retrieval and visualization at JPL/NASA and Fuji Xerox Palo Alto Research Lab.

CATHERINE D'IGNAZIO
Catherine D'Ignazio is a Masters student at the MIT Media Lab. She conducts research on ways to "engineer serendipity" - to stage encounters with information outside our comfort zones, biases and habits. She is an artist, software developer and educator. She is the Director of the Institute for Infinitely Small Things, an interventionist performance troupe, and former Director of the Experimental Geography Research Cluster at RISD's Digital+Media MFA program.

ERHARDT GRAEFF
Erhardt Graeff is a Masters student at the MIT Media Lab and MIT Center for Civic Media. His latest projects involve building technologies that empower people to be greater agents of change, performing quantified analysis of media ecosystems, and documenting new forms of civic participation enabled by digital media.

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