
A Public Service Media Perspective on the Algorithmic Amplification of Cultural Content

An analysis of the cultural significance of music recommender systems

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ALGORITHMIC AMPLIFICATION AND SOCIETY

A project studying algorithmic amplification and distortion, and exploring ways to minimize harmful amplifying or distorting effects

Abstract

Streaming entertainment platforms curate cultural content such as music, film, and literature, significantly influencing the nature of individual cultural experience. Recommender systems play an important role in this process, using algorithms optimized for factors such as engagement, retention, and revenue to guide curatorial decisions. In this context, multiple studies have demonstrated that recommender systems amplify some genres or groups of content creators while overlooking others. Although these studies highlight distortions in the content people consume, they do not provide guidance on what appropriate curation of cultural content should entail. To address this lack, we analyze algorithmic amplification in the specific context of curation of cultural content. We focus on disparities between personalization, a goal of current recommender systems, and normative concerns about the algorithmic curation of cultural content. Specifically, we explore how curation can be developed in order to promote cultural experiences oriented toward social justice and the public good. For guidance on such normative concerns, we turn to principles underlying public service media (PSM) systems in democratic societies. These principles, refined over decades in the programming of cultural content, expand the desiderata of recommender systems—both commercial and noncommercial—to include values furthering the democratic well-being and the cultural and social development of contemporary societies. Building on our recent work developing a metric to measure two PSM principles, commonality and diversity, in recommender systems, and with a focus on music recommendation, we propose a more comprehensive research program toward incorporating such principles into the design of recommender systems for cultural content,

inviting the research community to address how such normative goals could transform processes of algorithmic amplification.

Introduction: The Normative Turn and Its Importance for Cultural Content

This symposium's title, "Algorithmic Amplification and Society: Optimizing for What?," invites normative responses: what are the values and principles that algorithms *should* be optimized for? Such a normative turn in the debates around AI, distinct from the established "AI ethics" paradigm, is a good example of the virality of ideas. Not only our research group and the symposium organisers, but several symposium participants and other researchers in the recommender systems community have all converged recently on the need for new normative thinking about AI in the context of recommender systems. This is welcome, and we ourselves have been working on this for three years in the context of the research program *Music and AI: Building Critical Interdisciplinary Studies*, funded by the European Research Council. We have published on this research,¹ and this paper serves as an expansion of our previous work.

In our view, progress in this broad area starts with critique, followed by normative thinking (how should things be?, how could they be better?), and then design—with additional insights derived, optimally, from empirical research aimed at testing out aspects of this chain of argumentation.²

We also advocate for specificity—because the specific domain of application of algorithmic systems matters. In this light we begin by noting that the algorithmic recommendation of cultural and entertainment content must be thought normatively in different ways from news and information—which is where attention has mainly focused, for example in debates about the digital public sphere or communicative justice. Our research group focuses on music, as well as movies and books, taking these areas of cultural production and consumption to be focal for considering how recommender systems are mediating musical, filmic, and literary experience—not only for individuals but collectively, across societies.

Normatively, our work is in dialogue with principles developed by public service media (PSM) organisations like the British Broadcasting Corporation (BBC) and the Canadian and Australian Broadcasting Corporations. PSM is a worldwide phenomenon; the BBC is often the model, and it has exerted great influence historically on public interest models of media organization in Europe and the Commonwealth. We take our lead from the normative principles underlying the BBC; one coauthor (Born) has carried out over two decades of research and has published widely on the BBC and PSM.³ The recent discussion on the social media platform X (formerly Twitter) over the BBC's designation

as “government-funded media” repeats a common misunderstanding: the BBC is not a state broadcaster; it is publicly funded by a dedicated tax, and it is independent of government, albeit imperfectly. In an era when populist governments and political movements are on the rise, the very idea of PSM faces increasing scepticism and attack. The intense competition unleashed by streaming services has similarly undermined public commitment to PSM. Yet in many countries PSM remains a vital keystone of the media ecology, far from confined to market failure, with considerable power to influence that ecology. At the same time, many of the dominant platforms involved in the recommendation of cultural content are based in the United States, where PSM has been relatively marginal to the media landscape.

We take the BBC’s normative foundations as a guide to important values that might be translated into the digital space. But we emphasize that, while our work is certainly relevant to the BBC and other PSMs (see footnote 2), its relevance is not limited to them: the conceptual work and normative ideas we outline here have implications for the wider ecology of digital platforms delivering cultural content, and especially for the recommender systems widely deployed on these platforms. We agree with the Ada Lovelace Institute report on the BBC’s work on responsible recommendation that there “is a real opportunity to create a hub for the research and development of recommendation systems that are not tied to [commercial] goals,” and that “this is especially important as recommendation systems are one of the prime use cases of behavior modification technology.”⁴ We anticipate that, just as results from research on algorithmic bias have provided tools for designers of responsible AI technologies in industry, the results from our research can similarly influence the commercial development of recommender systems and AI applied to cultural content distribution and generation in industry.

Our focus today is on music recommender systems, and we intend to expand how we analyze the values embedded in these systems beyond current conversations limited to algorithms alone. For, while we recognize the significance of algorithms, our research suggests that what is needed now is a critical appraisal of these wider systems. From a system architecture perspective, deployed recommender systems involve a wide variety of supporting technologies and decisions, including catalog curation, data labeling, and interface design, which often themselves explain system behavior better than a recommendation algorithm in isolation. In line with ideas from both science and technology studies and music studies, we identify a recommender system as a *sociotechnical assemblage*. We take our definition of assemblage from Deleuze, for whom an assemblage is a multiplicity made up of heterogeneous components, each having a certain autonomy, a multiplicity “which establishes liaisons [or] relations between them ... [and where] the assemblage’s only unity is that of a co-functioning.”⁵ Nick Seaver advocates a similar approach when he suggests that “algorithms are not

autonomous technical objects, but complex sociotechnical systems;” moreover, “there are no unsupervised algorithms.... If you cannot see a human in the loop, you just need to look for a bigger loop.”⁶ Designating recommender systems as sociotechnical assemblages implies that these “technologies are embedded in the social context that produces them.”⁷ It implies further that the assemblage includes, for example, human editors, the communities validating their knowledge, and user populations—that is, the social knowledge and social labour that go into its operation; but scaling up, it also includes the industry structure in which a recommender system is entangled, which significantly shapes its functioning.

What Are the Normative Principles of Public Service Media (PSM)?

A substantial body of research in media, political, and legal theory has identified a group of normative principles guiding public service media (PSM) and how these systems function as a communicative and cultural infrastructure for democratic societies.⁸ Such research seeks both to establish philosophical foundations and to guide policy and regulation in territories in which PSM is a core pillar of the media ecology. We will review the principles briefly and then consider the challenges of translating them into the design of music recommender assemblages. The principles do not provide readymade solutions; they need interpreting and elaborating, and then translating into design. In attempting this translation, our work participates in the “values in design” debate,⁹ which pursues the challenges of reflexively “incorporating human values... into formal models.”¹⁰ “Values in design” recognizes that the development of formal models for machine learning systems tend to fall back on “considerations that are [already] legible within the language of algorithms,” such as accuracy or efficiency.¹¹ It is to find new approaches to identifying values for recommender system design that we turn to PSM. As Luke Fish and Ben Stark comment, “expanding formal models to include social values... may be situationally and strategically useful,” even if “such solutions are insufficient as full remedies to the inherent limitations of formal modelling.”¹² It is from an awareness of what *cannot* be rendered as formal modelling that we find it imperative to broaden our focus and to address music recommendation as an assemblage. Our analysis therefore highlights domains where values are embedded beyond the algorithm, domains that might in principle include interfaces, catalog construction, evaluation metrics, metadata, and industry structure.

There is general agreement in the literature on a set of normative principles that have guided the historical development of PSM. Most appraisals include: citizenship, universality, independence, quality, innovation, diversity, and accountability. As mentioned, these principles have been interpreted in different ways and they require elaboration. More recently, for the interactive digital environment, additional principles

have been mooted, notably participation and partnership. The principles can be distinguished by their purposes: some concern primarily the relationship to audiences, publics, and citizens (citizenship, universality, accountability, participation); some the PSM's institutional standing and its relationship to government, industry, public institutions and civil society (independence, partnership); and some the content or services produced and distributed (quality, innovation). Notably, diversity has several meanings spanning these purposes.

As normative values with wider application, PSM principles are productive because they help to pinpoint *problems* with the design of music recommender systems while also holding out *challenges and opportunities* to guide alternatives in designs. Our arguments today take off from two such problems in music recommender design that are at odds with the normative aspirations we advocate: 1) personalization, and 2) the model of the user.

Problems With Personalization as a Paradigm for Music Recommender Systems

Personalization refers to music track recommendations that are conditioned on user preferences—explicitly provided or inferred from logged behavior data—and whose utility is based on the user's satisfaction—again, explicitly provided or inferred from logged data. From this perspective, an ideal track to recommend is one that would most satisfy a specific user in a specific context.¹³ From a commercial perspective, measuring and optimizing performance for each individual user's experience aligns well with a variety of revenue streams. In advertisement-based or paid-placement streaming music platforms, increased individual engagement with relevant tracks results in higher exposure to paid content due to longer listening sessions. In subscription-based platforms, increased engagement accomplishes the same goal at a longer horizon, retaining users month to month and maintaining subscription revenue. In both cases, commercial platforms aim to select each track in a stream to maximize the lifetime value of users to the platform.

Yet increasing evidence suggests that, while personalization may be one desirable property of a recommender system, it fails to capture the cumulative influence of recommender systems on the evolution of cultural experience and taste across populations and over time. For personalized recommendations *are* having cumulative effects, shaping the cultures and societies in which they are used.¹⁴ Recommender systems—conceptualized, again, as an assemblage including algorithms, interfaces, and catalogs—influence content consumption, creator incentives, and dominant formats. The personalization paradigm understands the effects on consumption as a kind of aggregate individuation; but this is inadequate both empirically and normatively. In

light of PSM principles and related perspectives from democratic theory, the question is: if we acknowledge the cumulative cultural and social influence of recommender systems, *to which cultural and societal ends should this influence be directed?*

The result of personalization is arguably, then, to encourage fragmentation and atomization based on the recursive individuation to which users are subjected. It is ironic that, in an era when the identity politics of difference have become heightened, personalization is the dominant mode of address of digital platforms and recommender systems, since this belies the intensity of people's commitment to and problematization of their membership in social and cultural groups. Such identity politics depend on the existence of social communities that, often by virtue of shared demographic features, experience both common inequalities and injustices *and* the pleasures and benefits of solidarity and belonging.

The principles of citizenship and universality at the heart of PSM recognize human life as embedded in social and cultural communities, addressing the PSM audience as *publics* composed of *citizen-consumers*.¹⁵ Under the principle of universality, from the 1920s to the 1980s the PSM audience was assumed to be a relatively homogeneous national public; from the 1980s to the present strides have been made toward greater pluralism of representation among multiple publics or “counterpublics.”¹⁶ In fact, universality encompasses three distinct normative aims:

1. universality of *access*—that the whole population should have free access to PSM services (a principle compromised by the privatization of the internet);
2. universality of *genre*—provision of the full spectrum of types of content, from news and education to entertainment;
3. and central to this discussion, *social and cultural universality*, which itself integrates two complementary goals: provision of content serving the interests and needs of minorities and subaltern groups as well as majorities, and in parallel enhancing social unity by creating “universal” experiences, thereby encouraging and building a common culture.¹⁷

The principles of PSM therefore articulate a key architecture of multicultural democracies: the need for media to stage for a society communicative *and cultural* encounters within and between its component minorities in order to enhance both solidarity within groups *and* mutual understanding, empathy, and tolerance between them.¹⁸ The dialectic between universality and diversity should be evident here.

This last norm, social and cultural universality, summarizes several developments in democratic theory. Given the reign of personalization, it is salutary, first, to recall the

sheer significance of social groups for pluralist democracies. As the political philosopher Iris Marion Young (2020 (1997)) puts it, “social groups are real”:

Social group designation and experience is meaningful for the expectations we have of one another ... and the status we assign to ourselves and others. These social group designations have serious consequences for people’s relative privilege or disadvantage. The politics of difference arose from a frustration with exhortations that everyone should just be thought of as a *unique individual person*, that group ascriptions are arbitrary ..., that liberal politics should transcend such petty affiliations and create a public world of equal citizenship where no particularist differences matter to the allocation of ... opportunities. [But] oppressed groups found that this humanist ideology resulted in ignoring rather than transcending the real material consequences of social group difference.

Of course, “everyone relates to a plurality of social groups.” Yet, “to deny a reality to social groupings both devalues ... cultural and social affinities and makes political actors unable to analyze patterns of oppression.”¹⁹ It is the recognition of human beings as embedded in social and cultural communities, and the need for communication platforms and media to support mutuality both within and between groups, that personalization occludes.

A second productive angle beyond personalization turns on the normative concept of a *public*—after all, the very idea of public service media turns on the existence of publics. So how should we understand them? In debates over digital platforms the idea is often captured by a post-Habermasian focus on the rational-critical space of debate encapsulated in the idea of the public sphere, undermined as it is by information filter bubbles, echo chambers, and so on.²⁰ However, a number of political theorists insist that this focus on news and information should be accompanied by an equal concern with the publics generated by common exposure to *cultural* content. According to Michael Warner, publics in this wider sense are always “mediated by cultural forms” like music and entertainment; that is to say, publics are the groups that coalesce by virtue of being commonly addressed by such cultural forms. Moreover, a public is *reflexive* in that its members are imaginatively aware of their common cultural experience and of this generating an ongoing space of discourse and encounter, of mutuality.²¹ A public is, then, the social formation created by common experiences of, say, music, movies, or literature. Personalization in music recommendation, by neglecting both the existence and the desirability of musical publics, undermines the public nature of musical life. The implication is: to reinstate the genesis of musical publics, we need platforms and recommender systems to support the commonality of experience of the music they

distribute, to make this known to users, and to enable channels of both discourse and sociability.

A third normative perspective adds further post-Habermasian weight by stressing that the dialogical exchanges central to pluralist democracies cannot be confined to critical reason but must include the ways in which expressive cultural forms—music, literature, entertainment—generate the imaginative, aesthetic, and emotional identifications with others on which democratic politics depend. Indeed, for the philosopher Martha Nussbaum, emotion is a core component of ethical reasoning, and a compassionate citizenry depends on cultural forms, by engaging the emotions, to extend its capacity for not only empathy but reason—processes essential to the wellbeing of the political culture.²² The critical race theorist Stuart Hall contends, in turn, that “the quality of life for black or ethnic minorities depends on the whole society knowing more about the ‘black experience’,”²³ experience that he argues is gained most compellingly via the riches of black expressive cultures, whether music, movies, or rap poetry.

Together, the norms of citizenship, universality, and diversity converge in the concept of cultural citizenship. In recent decades, this has been portrayed as the primary form for the exercise of citizenship in pluralist societies. Cultural citizenship responds to recognition of the vast social transformations and challenges posed by globalization, increased migration, the growing heterogeneity of the populations of nation states, and the intensification of identity politics among subaltern, marginalized, and indigenous groups.²⁴ Given these profound changes, cultural citizenship draws attention to a “new domain of cultural rights [involving] the right to symbolic presence, dignifying representation,” and “the maintenance and propagation of distinct cultural identities.”²⁵ Hence, as we have suggested, in the context of multicultural societies, cultural citizenship requires a focus on both commonality and plurality, and platforms disseminating a diversity of cultural content through recommendation should aspire to enhance both *intercultural* and *intracultural* experience.²⁶

The triad of citizenship, universality, and diversity is therefore particularly relevant for recommender systems curating cultural content, highlighting the challenges of acting as a medium for both integration and pluralistic cultural experience.²⁷ If we acknowledge the role of recommender systems in influencing users’ tastes, then by analogy with the concern in democratic theory for the formation of an educated and informed citizenry, we might add a concern for the formation of a *culturally* mature and pluralistic citizenry. From this perspective, platforms distributing cultural content should be considered “theatres” of contemporary pluralism, and their recommender systems should be designed to promote common experiences of diverse cultural forms.

In light of these ideas, we note that there are currently three ways in which the recommender system research community *does* examine population-scale

recommendation properties. First, recent work on fair recommendation focuses on the representation of content creators from different demographic backgrounds across all personalization decisions.²⁸ The evaluation metrics associated with algorithmic fairness are often functions of the rank positions of tracks from different groups. While this contributes to enhancing diversity, such metrics emphasize either representation *in toto* across the platform or compute average expected exposure across users. However, this does not recognize the challenge of delivering such fair content as a *common* experience, as mandated by the principles of universality and cultural citizenship. The second way in which system designers think about common experience is negatively, by identifying content that should be universally “off-limits” in recommendation, for example tracks that are deemed “too risky.” This creates a common experience—but one of absence.²⁹ The third way is the surfacing of popular content, as defined by the frequency with which tracks are streamed by users. The recommender system research community, however, often sees recommending popular items as problematic and against the spirit of personalization, resulting in the development of algorithmic strategies to mitigate “popularity bias.”³⁰

Our recent work developing a new measure of commonality in recommender systems is an effort to translate two of the most important PSM principles, universality (commonality) and diversity (of source and content), into recommender system design, in the service of progress towards a third principle—cultural citizenship. We leverage methods and models from recommender system evaluation to formally measure commonality. But we note that our commonality metric falls short of capturing the reflexivity required of a public. Consistent with most research in the recommender system community, we assume that recommended tracks, including those shared across a public, can be transparently interleaved with personalized tracks. This is an artifact of the model of recommendations as lists or other arrangements of content, which, in turn, are often based on interface decisions, which do not currently include a highlighting of shared tracks. Even if algorithms were designed to support a common experience among users, nothing in the current framing of music or other content by recommendation playlists indicates to users that the cultural experience they are having is shared. Recommended tracks are presented as selected for individuals, and a track shared in common will not be recognized as shared. In this way, personalization reflects, but also accelerates, the attrition of any awareness of the value of common cultural experience among recommender designers and users. As such, while the algorithm may play a role in commonality, it will be bottlenecked by interface decisions that undermine the existence of a reflexive public.

Problems With the Model of the User Immanent in Music Recommender Systems

A second problem that we want to highlight in the design of music recommender systems concerns the model of the user, or consuming subject, immanent in them. As science and technology studies tells us, technological design always entails an implicit model of the user.³¹ Once again, we begin by identifying a problem, and then read out to a cascade of challenges and opportunities facing design.

Currently, music recommender systems largely bracket questions of aesthetic experience and judgement, and they do this in relation to two linked elements of the assemblage: in their conceptualization and modelling of the user's relationship to music, and of the editorial processes that guide curation. The ways in which recommender systems currently frame what users want to hear, we suggest, entails an impoverished understanding of the nature and the development of musical taste. Whereas, as we will show, PSM is predicated on quite different models of the consuming subject and her relationship to the cultural content provided by the PSM.

The mindset of the designers of music recommender systems is that individual consumers come with fully formed tastes, and that they merely seek something similar in the next track they listen to. The process of recommendation is modelled in the terms of serial, individual one-off choices, guided broadly by ideas of similarity between tracks, users, and contexts. Seaver points to the influence of the idea of information overload—that users face an overwhelming online archive—as bolstering the conviction that a user's main need is for automated filtering devices to delimit their consumption choices;³² and this in turn depends on a naturalized idea that a sovereign consumer's primary concern is with choosing among a given range of items or services. Such a belief in culturally self-sufficient, fully-formed individuals whose autonomous choices need automated nudging based on data on past behavior can be linked to the tenets of liberalism as well as to the long-standing links between computer science and behaviorist psychology.³³

The abstract “problem definition” of recommender systems also assumes a narrow idea of *why* users engage with a platform. Algorithmic recommendation often studies a single predictive task, most visible in the (re)use of publicly available benchmark datasets. Research with data such as the Last.fm, Spotify Million Playlist, or MovieLens datasets generally focuses on the task of predicting relevant items for a user, as evaluated by their historic data. This is aligned with well-studied methods in information retrieval, the research community behind search systems such as those that power Google. In the case of recommender systems, we only need to replace “keyword query” with “user” in order to adopt information retrieval interfaces (e.g., rankings) and evaluation (e.g., retrieval metrics). However, users approach music recommender systems with a variety of intents and needs, including new music discovery but also focused and immersive listening, nostalgia, and retrieval of known items. So, instead of music recommendation

being a homogenous task, the appropriate recommended tracks, interfaces, and metrics vary considerably depending on a user's musical knowledge, emotional and psychological state, and other relevant dimensions of social and cultural context.

In recommender system designers' preoccupation with the meandering pathways of individuated choice via the attractions of similarity, any more temporally-extended concern with the development of taste, or with how taste *should* evolve over time—either across the individual life course, or collectively in the sense of progressive cultural change—are evacuated in favor of an inductive, behavioral functionalism. The effect is that the design culture of recommender systems lacks awareness of its responsibilities for assisting in the progressive development of users' aesthetic experiences and musical tastes.

Our contention is that we should *not* conceive of taste or aesthetic experience as “fully formed” on the part of either individuals or collectives, but as developing and evolving, even progressing. It follows that the curation of what might be encountered by individuals and groups to *further* the development of their aesthetic experience carries serious responsibilities that necessitate judgment. There are two steps here: first, the need for an awareness that users' aesthetic judgements are being formed cumulatively, over time, by exposure to the music they encounter through recommendation; and as a corollary, the need to acknowledge that curation must entail judgement about what is made available to users as food for their aesthetic development. At stake here is the fundamental question of what kinds of *developmental pathways* are required to enable users' musical experience to grow and flourish. In some ways, the challenge is akin to the use of algorithmic recommendation in the classroom, where researchers often consider longer horizons than the next item and include hierarchical and sequential structure reflecting learning objectives.

It is essential to stress that in raising aesthetic experience, we are not making elitist arguments: these points hold for the appreciation of popular and folk musics as much as art musics—and here we join all those from musicology and cultural studies who consider that the progressive development of aesthetic experience both *matters* and *occurs* in relation to popular culture as much as the “high” arts.

This argument suggests the need for a different account to those prevalent in the design of algorithmic music recommendation of the *dynamic and social nature of the development of taste*, and of how musical experiences and the aesthetic sensibilities they nurture *evolve*. It should be obvious that these ideas underpin and complement the points made earlier about how cultural citizenship requires exposure to cultural content that will catalyse the further development of the cultural and social sensibilities of citizen-consumers—how music, entertainment, and the arts contribute to individual and collective inter- and intra-cultural awareness in the ways demanded by cultural

citizenship. Such an alternative account of the dynamic and social development of taste has to be both empirically-informed and normative. This perspective has similarities to research looking at large-scale dynamics of recommendation from a marketplace perspective.³⁴ Yet while also looking at collective and longer-term dynamics, the primary focus of these studies is *economic* measures of marketplace health, particularly platform revenue generated by attracting and retaining users and content providers.

PSM has operated with a markedly different model of how audiences relate to the cultural content they provide, a model intrinsically linked to the PSM principles of quality, innovation, and (content) diversity. It centres on an ontological claim and a model of the dynamic nature of culture. The ontological claim is a disarmingly simple one: that “producer intentionality in combination with the conditions bearing on production together determine the character of the output, and in this way condition and set the limits to consumption.”³⁵ This *ecological* account of the priority of production and its role in conditioning consumption clearly contradicts the consumer sovereignty model, which rests on a notion of pre-existing, autonomous consumer tastes that producers and distributors are required simply to serve. “In short, production is ontologically prior to consumption. For these reasons—even given the democratic importance of attending to the degree to which the content provided [by a PSM organisation] fulfils consumer desires and needs...—any normative framework concerned with quality of output must attend first and foremost to the conditions of production affecting that output.”³⁶

This approach is quite different from the model of track quality in music recommendation, where a given track is judged relevant based on consumer behavior. Signals such as explicit ratings, streams, and skips are taken to provide evidence for the relevance of an item to a user at a specific point in time³⁷ —once again, enshrining the ideology of consumer sovereignty. These signals are aggregated across an individual user’s logged responses when consuming tracks, as well as across other users whose data are also logged by the platform. As such, the relevance of a track is derived from the aggregation of individual consumer decisions, and this is often conflated with the algorithmic quality of a track, removing the producer and their intentionality from any notion of quality.

Two qualifications follow: first, these ideas might, again, be mistakenly seen as elitist, but they are not. “They do not rest on the assumption that producer judgements of quality are necessarily superior to consumer judgements, but on an ontological argument for production’s temporal and sequential priority over consumption and hence the necessity of attending to production.”³⁸ This is a model common in cultural theory, whether applied to popular culture or the “high” arts. And second, given that a focus on the effects of recommender systems must be concerned with what Helberger *et*

al., discussing news, call “exposure diversity”³⁹ —the “diversity of content or sources [actually] consumed by audience members, which... may be very different from the diversity of content or sources [made] available”⁴⁰ —this does not obviate the need to be concerned *also* with what is produced.

A final step in this cascade of arguments derives from cultural theories about the dynamic and social nature of aesthetic experience. The key writer is Hans-Robert Jauss (1982), who proffers a normative model of the changing nature of the experience of the consumer or audience in relation to a literary text—a model that can readily be extended to music or entertainment. His model turns on the concept of “horizons of expectation,” which are embodied in the text and also in the mind of the consumer. Literary criticism, he contends, must base its standards on a “reconstruction of the horizon of expectations, in the face of which a work was created and received.”⁴¹ On the one hand, Jauss’s account illuminates the *production* aesthetics immanent in a cultural text by attending to the prevailing aesthetic and formal conventions—what he calls the horizon—in light of which the text was conceived and created. His key insight is that when musicians are creating the next track or work, their task is not only to *meet* the existing horizon of expectation of the genre within which they are working but also to *exceed* that horizon of expectation, introducing a quantum of *difference* that advances the genre, so generating new experiences and new expectations. Hence, a “process of the continuous establishing and altering of horizons... determines the relationship of the individual text to the succession of texts that form a genre.”⁴² On the other hand, the model also accounts for the nature of aesthetic experience in *reception*, since as consumers we seek not merely to have our horizon of expectation about the next track met but, again, exceeded. Only in this way can the next track, the next aesthetic experience, reignite our interest, providing aesthetic pleasure and nourishment *in ways we could not possibly have anticipated or imagined*.

It is instructive to contrast the goal of exceeding existing horizons of expectation with how recommender systems are currently designed. Whereas early methods based on collaborative filtering focused on recommending tracks that people with similar listening histories have liked, contemporary recommender systems incorporate that long-term history with short-term listening history (e.g., of the last few tracks), demographics (when available), and any ancillary information logged by the system. Although much more sophisticated in their representation of user, context, and (potentially) trajectories of listening through genres, recommendations consist of elaborate collages of logged user behavior. As such, recommender systems are constrained by the past behavior that the system has already observed. In this way, any model of taste development that a recommender system employs is limited to what earlier users have experienced. The space of recommendations is therefore bounded by logged consumption behavior, and any novel trajectories of taste development, i.e.,

those that explore new “horizons,” lie outside the “imagination” of current recommender design.

It is a combination of the ontological primacy of production and this dynamic model of the development of aesthetic taste that underlie PSM’s model of the consuming subject and her relation to the cultural content provided. Whereas in the sovereign consumer model the issue is the adequacy of producers’ and distributors’ response to users’ putatively pre-existing tastes, in the ecological model proposed here the critical issue is the quality, innovation, and diversity of the cultural content produced and made available to users, content that by continuously fuelling the ever-evolving horizons of expectation will cumulatively condition the future direction not only of audience tastes and aesthetic sensibilities, and through them wider currents of public culture, but of wider content markets. Once again, this is no elitist stance. Quality, innovation, and diversity have been—and will continue to be—defined pluralistically, relative to specific genres of content, including popular and entertainment genres. Quality is likely to encompass such values as high standards of professionalism, aesthetic imagination, ethical integrity, and execution relative to specific genres of content. Innovation, in turn, is likely to signal a stronger type of difference introduced into a certain genre or through the hybridisation of genres, strenuously shifting the horizon of expectation. Diversity of content is likely to refer to the range of genres, or range within a genre, in the content produced and distributed, but it can also refer to diversity qua the source of the content—whether in terms of musicians, artists, or production companies, with diversity defined in terms of their demographic, geographical, and/or cultural underrepresentation. If making judgments of this kind relative to specific kinds of content is thought impossible, then Jauss’s model provides a way, enabling an ongoing assessment of how a particular piece of content—say, a music track—either recapitulates the existing horizon of expectation in the relevant genre or exhibits a degree of inventiveness, markedly departing from that horizon. It is, then, “against the background of an analysis of the history of a genre-in-process... [that it is] possible to assess the degree of inventiveness or redundancy of the cultural object in question.”⁴³

A final guide to quality and innovation stems from studies of the production cultures of popular music and entertainment within PSM organizations. Born’s two-years of ethnographic research inside the BBC’s production departments and channels shows how the BBC, “founded as a value-imbued public institution,” intended “to foster the evolution of the ethics and aesthetics driving its [content creation and programming], values that would be manifest in its productions.”⁴⁴ On the basis of her ethnography, Born charts empirically how the ethics and aesthetics of BBC content producers differ in relation to the particular genres in which they specialize. Although having a professional production culture replete with shared ethical and aesthetic reflexivities,⁴⁵ overseen by external regulation, public feedback and critical assessment, does not

guarantee that high standards of quality or innovation will be met, it is likely to foster them—more so than if they were absent.

As an example, take the BBC's main popular music station, Radio 1. Its repositioning in the later 1990s testifies to the values mentioned. As Born's ethnography shows, those overseeing the channel posed the normative question: What was the BBC's justification for intervening in popular music radio, given the plethora of competing commercial channels available? As a result of this reflexive normative exercise, the station's new "theology," informed but not dictated by market research on their target audiences, was "New Music First": the network aimed to become a showcase for up-and-coming bands, not only reflecting but also catalyzing current trends in a way the collusive duo of the record companies and commercial radio would not. "Through its independence from commerce, the revamped Radio 1 should find and nurture new talent... It should take risks and innovate by exposing its audiences to unfamiliar musical genres.... Independence and integrity—those age-old BBC values, imaginatively reinterpreted—were the watchwords."⁴⁶ Or, in the words of a leading music executive involved in the repositioning:

Radio 1's got to be for young people; it's got to be mixed genre; it's got to lead by playing more new music, encouraging new British artists and DJs and investing in live acts. It's got to be about the young experience and that passion for music. That's what distinguishes us from the commercial market, which is about maximizing share... Radio 1 leads and invests in new music in a way the market won't.⁴⁷

Zooming Out to the Music Recommender Assemblage: Editors and Industry Structure

For music recommender systems to achieve the normative orientation toward quality, innovation, and diversity we have identified as desirable, the previous ideas must be combined with the broader conditions that are likely to facilitate their achievement. This points to two last moves we consider necessary, both of which take us beyond a focus on algorithms out toward the wider assemblage.

First, we consider human editors to be a vital element of the assemblage: human editors must be involved in these judgments. But in addition, we seek to move beyond the existing "individual gatekeeper" model of editors whose judgements set the tone—the prevailing, centralized model of expert curation. We must recognize that aesthetic judgement is both individual and social, shared among those participating in a type of musical public that we designate a "value community," and the object of reflexive

discourse centered on particular artists, genres, works or tracks. In this light, the role of editors is, first, to reflect on the quality, innovative nature, or diversity of a recommender with respect to a given category or categories by drawing on insights, orientations, and judgements generated by the larger value community knowledgeable about the relevant musical expression (whether genre, work, or track), and then to intervene editorially to amplify these desired qualities. By value community, we refer to the existence of communities sharing cultural interests and tastes (such as genres, artists, or works), who embody an evolving consensus about the shared cultural interests they enjoy, and about which members have varying degrees of expertise.⁴⁸ More or less consensual and relational judgments of value will emerge from such a value community—yet they will inevitably encompass a lively and shifting dissensus within the consensus.⁴⁹ The human editors we envisage act as conduits for these larger communities of taste and interest, and, crucially, their judgments will be informed, legitimised, and validated by this grounding, as well as accountable to those communities.

This is a social model of evolving judgement, acknowledging the social knowledge and social labour immanent in aesthetic judgement. It is one more likely than the individual expert model to be alert to the ever-shifting perceptions that underpin judgments about quality, innovation, and diversity in how a music recommender system functions and the nature of its rankings. Furthermore, the relationship we have proposed between editors and value communities resonates with conversations in the human–computer interaction (HCI) community aimed at democratizing design through participatory and community-based methods. At the same time, participatory methods are increasingly of interest to researchers in the “ethics and AI” community in order to better capture and represent values held by protected and underrepresented communities and cultures.⁵⁰ This is why, in developing our commonality metric, we explicitly rely on accountable editors to understand the types of shared experience required in order to orchestrate those intercultural and intracultural experiences that together compose a cosmopolitan version of cultural universality. While human involvement is often considered a negative design principle in computer science, we stress the importance of non-algorithmic stakeholders in these normative conversations, especially those concerning the nature of editorial processes, the desirability of publics, and the development of individual and collective aesthetic experience.

The final element of our normative rethinking of the music recommender assemblage zooms out to the industry structure within which it operates, in several interconnected ways. We are surprised that, thus far, this aspect of the recommendation of cultural content has attracted less attention. For what is blazingly clear is the extreme degree of concentration exhibited by the major global platforms as they function worldwide through licencing and acquisition deals with the major record companies. David

Hesmondhalgh et al. (2023) provide a cogent account of the development of this situation through the lens of how infrastructures shape culture. On the basis of a case study of music, they argue “that one important way to consider infrastructure as part of an account of how culture is shaped and influenced is to examine developments in infrastructural politics over a relatively long duration, as part of a macro-historical account of change and continuity.”⁵¹ They do this for the changing fortunes of music online employing Julie Cohen’s analytical triad of propertization, datafication, and platformization. The result of these processes, they contend, “is a musical ecosystem that now essentially consists of two parallel oligopolies: music platforms owned and controlled by technology companies (with Spotify, Apple, Google, and Amazon dominant across much of the world, and Tencent in China) and a recording sector with corporate rights owners scarcely less profitable and dominant than before the internet.”

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One major implication of their analysis concerns the resultant gatekeeping regarding the catalog. Music recommended on the major platforms is drawn from a catalog of tracks procured through licensing and acquisition agreements with the corporate recording sector, effectively constraining the space of possible tracks that can ever be recommended as well as dictating the cost associated with tracks. The former sets limits on the decisions an algorithm can make (i.e., it cannot recommend tracks that are not in the catalog); the latter adds the pressure of monetization to these decisions (i.e., it may be more lucrative to recommend less costly tracks). Our proposal is that alternative public interest models of the catalog should be developed to complement and counteract this existing commercial structure with its dual lock-ins: the dominant platforms exerting monopolistic tendencies in distribution and curation, the major record companies’ grip on global music markets favoring monopolistic provision of music for the catalog backed by IP law and its presumption of privatized music. Of course, this raises a vast number of issues, but we contend that such thinking must now be advanced and that regulation to open up alternatives is an essential challenge for the present moment.

To throw light on our proposition about alternative, public interest institutional bases for the catalog, and suggesting that it may not be so unthinkable: In the 2000s the BBC nurtured a project called the Creative Archive (CA). Responding to Lawrence Lessig’s idea of a creative commons,⁵³ and to the burgeoning of user-generated content, the CA was intended to make available free content from the BBC’s vast, publicly-funded audiovisual and music archives as well as other publicly-owned content for consumption and nonprofit creative reuse. By 2005, the CA project had led to the formation of multi-institutional partnerships with other British public cultural bodies, including the British Film Institute, Britain’s second PSM, Channel 4, and the Open University. All were committed to making content available under the terms of the CA

Licence: a shared user licence scheme for access to moving images, audio, and stills. Inevitably, the CA sparked fierce debate over the future shape of IP rights in the content; it also met some regulatory resistance. Yet the vision of a public catalog remains, and a key commentator noted the synergies between the CA and “creative economy” policies, arguing that “public sector organizations have seized the initiative to liberate a broader creativity among the public.”⁵⁴

Our second observation about industry structure centers again on the conditions conducive to diversity of both source and content, as well as the relationship between them. It concerns a different criticism of the existing lock-in manifest in the licensing and acquisition agreements between global platforms and record companies, and it is informed by established arguments about media industries from critical political economy and their implications for the platform present. It has long been debated in the history of the recorded music industry that a rise in innovative and diverse output can generally be correlated with those periods in which the industry structure was less concentrated and more pluralistic, containing not only large but medium-sized and small, “independent” companies. In music, such a plural industry structure was a feature of much of the second half of the 20th century; it was always unstable and changing, and history shows waves of more and less industry concentration.⁵⁵ Although more research would be needed to substantiate this point, it seems likely that, worldwide, small and local music producers and record labels and their rosters of artists are being doubly disenfranchised by the extreme concentration of marketing and distribution represented by the licensing and acquisition agreements characterizing the dominant music platforms.⁵⁶ Returning to a key earlier theme: increasing diversity of source and producer, both as an issue of equity in itself and as it bears on the diversity of content, is critically important in order to achieve recommender systems oriented toward enhancing cultural citizenship. Regulation to (re)generate more pluralistic production and distribution sectors in the digital music economy, even given the disintermediation represented by platforms like Bandcamp, would unleash greater source diversity, which in turn is likely to result in more diverse content. This would redress the problematic underrepresentation of certain categories of both source and content.

Conclusions

We began with two contentions: that the normative principles underlying the curation of cultural content by public service media deserve special attention and point to important wider implications for design; and that, in order to uncover and mitigate critical problems associated with existing music recommender systems, it is imperative to look beyond the algorithm and conceptualize these systems as assemblages. Fostering the existence of reflexive musical publics, themselves components of the cultural

citizenship deemed essential to the well-being of multicultural democracies, necessitates not only fundamentally shifting away from purely personalized understandings of the needs of users, but also changing interfaces to highlight the music shared. The pursuit of the principles of quality, innovation, and diversity in cultural recommendation demands both a reconceptualization of the user, for which, as we have shown, strong resources exist, and a move away from recommendations that merely interpolate past user behavior.

Together, these two changes depend on a radical reconceptualization of the relationships linking cultural production, distribution, curation, and consumption. The values of quality, innovation, and diversity also require the involvement of accountable human editors—because algorithmic development alone will never draw curation closer to value communities, given the limitations of the consumer-driven assumptions behind how “good” is quantified in recommender systems. And finally, to enhance diversity of both source and content in cultural recommendation requires an interrogation of the privatized nature of the catalog, its construction, and its meaning, beyond a collection of identifiers, and will be enhanced by achieving a less concentrated, plural industry structure. Indeed, in the oligopolistic platform present, public interventions are likely to be necessary to create the preconditions for cultural citizenship.

These combined observations highlight the need for a research program focused on the development of strategies to address the frictions between current recommender system research and the normative values we have outlined—values that point toward the redesign and retuning of music recommender systems in order to achieve profound musical, cultural and social benefits.

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