Distances in the Field: Mapping Similarity and Familiarity in the Production, Curation and Consumption of Australian Art Music

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Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

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Abbreviations

ABC	Australian Broadcasting Corporation
ABS	Australian Bureau of Statistics
ACF	Australian Cultural Fields
AMC	Australian Music Centre
ANOVA	Analysis of variance
API	Application programming interface
APRA	Australasian Performing Right Association
BPM	Beats per minute
CA	Correspondence analysis
CD	Compact disc
CEO	Chief executive officer
EIC	Ensemble intercontemporain
EFA	Exploratory factor analysis
ERB	Equivalent rectangular bandwidth
ERGM	Exponential random graph model
HPCP	Harmonic pitch class profile
INSEE	Institut national de la statistique et des études économiques [National Institute of Statistics and Economic Studies (France)]
IRCAM	Institut de Recherche et Coordination Acoustique/Musique [Institute for Research and Coordination in Acoustics/Music]
MCA	Multiple correspondence analysis

MDS	Multidimensional scaling
MFCC	Mel frequency cepstral coefficient
MIR	Music information retrieval
MPEG	Moving Picture Experts Group
PAM	Partitioning around medoids
PCA	Principal components analysis
SD	Standard deviation
SE	Standard error
SNA	Social network analysis

Abstract

This thesis provides a timely intervention in the investigation of cultural fields by employing traditional and new data analytics to expand our understanding of fields as multi-dimensional sites of production, curation and consumption. Through a case study of contemporary Australian art music, the research explores the multiple ways in which the concept of 'distance' contributes to how we conceive of and engage with fields of artistic practice. While the concept of distance has often been an implicit or axiomatic concern for cultural sociology, this thesis foregrounds how it can be used to analyse fields from multiple perspectives, at multiple scales of enquiry and using diverse methodologies. In doing so, it distinguishes between notions of distance in the related concepts of *similarity* and *familiarity*. In the former, the relative proximities of cultural producers can be mapped to discern and contrast the organising principles which underlie different perspectives of a field. In the latter, the degree of an individual's familiarity with an item or genre can be included in theorisations of cultural preferences and their social dimensions. This is disrupted in a field such as Australian art music, however, as its emphasis on experimentation and innovation presents barriers to developing familiarity. Distance can be considered a defining characteristic of this field, and motivates its selection as a critical case study from which to investigate how audiences form attachments to distant musical sounds.

The empirical analysis begins in Chapter 2 by contrasting how the similarity of cultural producers is variously conceived of from different perspectives and positions in the field. Composers, curators, audiences on social media, and the music itself, each produce a distinct representation of the field with its own structuring dimensions. Chapter 3 then draws on these models of similarity to develop proxy measures of perceived familiarity. These are used in a quantitative content analysis which contrasts how the space of Australian art music producers is curated and mediated to audiences across radio, live concerts and digital playlists. Chapter 4 shifts the scale of analysis by drawing on interviews with concert attendees to examine how audiences negotiate their interest in a musical genre which is frequently distant, difficult and perplexing. The final empirical analysis, in Chapter 5, then examines processes of music discovery in the domain of digital consumption. Drawing on an online survey and responses to personalised music recommendations, the analysis

investigates the relationship between similarity and familiarity, together with the predictors of affective preferences for unfamiliar music.

The investigation of distance from multiple perspectives, using different scales of analysis and across a series of focal points in the lifecycle of artist practice, provides an analysis of Australian art music in terms of the tensions which emerge from these intersecting representations of the field. The singular spatial representation of 'objective relations' in a field, and a concern with power and domination – as found in the approach of Bourdieu – is replaced by a multiplicity of sets of relations and a concern with their organising principles and juxtapositions. The thesis argues that the actor constellations which distances produce are intimately linked to our capacity to engage with fields as discrete and knowable domains of cultural practice. Beyond our capacity to know a cultural field, it also argues for the importance of reconsidering how we form attachments to distant musical tastes. As an avant-garde genre which embraces foreign and confounding sounds, audiences require the capacity to draw on a range of consumption strategies and techniques to successfully engage with and value the unfamiliar.

1 Introduction

The question of how and why audiences are attracted to new and unfamiliar sounds has been a concern for both academic research and diverse professionals involved in the creation, presentation and dissemination of music. This thesis responds to this issue by investigating how our capacity to know and engage with a particular field of musical practice can be understood through the lens of *similarity* and *distance*. Focussing specifically on contemporary Australian art music, these concepts are investigated by analysing the positions of composers in their field of production, together with audience receptions of their music, in order to establish how conceptualisations of distance can inform our engagement with and understanding of the field. The relative positioning of composers identifies them as central or peripheral, prominent or neglected, and makes their collective activities knowable to us as coherent fields of practice. The use of distance to inform how we know and conceive of a field is then applied to consider the related and consumption-oriented conceptual pairing of the *familiar/unfamiliar*. Familiarity has been a long-standing, if often axiomatic, concern of research in fields such as cultural sociology and music psychology. The notion of audiences choosing to engage with music which is distant and unfamiliar fits awkwardly, however, into common theorisations of taste and preferences. This issue is foregrounded in the thesis, by examining how audiences encounter and respond to works and genres which are of varying distance to their habitual musical tastes. The potential correspondence between similarity and familiarity becomes a topic of empirical relevance – both to the operation of taste, and to the design of curatorial and technical systems to support the consumption of culture.

The concept of *distance* examined in this thesis complements the spatial metaphor of 'field' which is used to bound the cultural and artistic practices of Australian art music. The term 'field' can be both a general way of referring to the space of participants and relations involved in cultural production or consumption, and also a specific conceptual lens for analysing hierarchies of social formation (e.g. Bourdieu, 1993). In both cases, 'distance' can be considered in terms of the proximity of different actors to each other and their resulting *similarity*. Whereas Bourdieu's

interest in objective social relations emphasises the distances between sets of actors which result from differential relations to or possession of capital, distances can more generally be articulated from a range of socially embedded perspectives. Composers can share acoustic similarity, be performed at similar venues, or be appreciated by similar audiences. The role of distance can also be observed in the related concept of *familiarity* and (musical) taste. Bourdieu (1984, p. 56) considers taste 'the practical affirmation of difference' in which 'all determination is negation'. Processes of social differentiation not only produce the kinds of distances among the social classes of consumers found in Bourdieu's correspondence analyses, but also produce varying familiarity with the logics of particular works. The potential relationship between the *similarity* of works, and taste born of *familiarity* forms one of the themes examined in this thesis. Beyond the traditional focus given to questions of production and consumption, the thesis also argues for the importance of how distance operates in processes of *curation* – as a particular form of mediation – for understanding field dynamics. This thesis suggests that it is only by grappling with the plural manifestations of distance that we can understand fields as multidimensional sites of practice.

The specific practices of contemporary Australian art music – which encompass genres spanning contemporary classical, improvisation, sound art, and particular styles of jazz and algorithmic music – exhibit a range of qualities which make it a particularly interesting site to conduct these investigations. As a niche field, it is largely unfamiliar to most audiences. Even for those who have an interest in the genre, its heterogeneity of styles and emphasis on experimentation and novelty present a continual challenge to audiences due to the way it evades familiarity. Contemporary art music also occupies an ambiguous position within Australia's cultural landscape. It draws on a lineage which is commonly associated with elite 'highbrow' or 'legitimate' forms of classical music, yet simultaneously proclaims its connections to contemporary time and place.

This remainder of this chapter serves to introduce the research questions which are investigated by the thesis, while also placing the research into its personal, professional, academic and methodological contexts. I begin in Section 1.1 with two

personal reflections on my own engagement with contemporary Australian art music. These reflections not only provide an introduction to the field through cursory sketches, but also touch on many of the professional issues which the research emerges from and engages with. These range from how the field is constructed and understood as institutional actors grapple with its identity, through to the techniques which audiences employ when listening to confronting or perplexing musical sounds.

The central aim of the thesis – to investigate how the concept of distance can be variously quantified to understand the spaces of Australian art music production, curation and reception – is articulated through specific research questions as detailed in Section 1.2. These questions are addressed through four discrete yet logically connected empirical investigations which employ a range of quantitative and qualitative modes of analysis. In addition to the professional concerns which have motivated my thesis, Section 1.3 broadly situates the contributions made by the research within the fields of cultural sociology, music psychology and music information retrieval. Part of that contribution lies in the way the thesis responds to the current era of big data in adopting novel methodological approaches to investigating cultural fields. Section 1.4 expands on this by charting the ways in which the thesis has been shaped by the opportunities and challenges presented by the contemporary socio-technical environment. The structure of the thesis is summarised in Section 1.5, which provides an overview of each of the discrete analyses and places them in the context of the overall narrative which coheres the research.

1.1 Reflecting on the field of contemporary Australian art music

1.1.1 *Cantilena Pacifica*

My recollection of the funeral of Richard Meale is that it was not well attended. Meale was one of Australia's most significant and renowned composers: a pioneering figure in the avant-garde and modernism, he had a formidable reputation for his fiercely held opinions. He performed Australian premieres of music by Boulez and Messiaen, and his own output ranged from operas to solo works. One of the last

works he wrote before his death, the Sydney Symphony commissioned orchestral work *Three Miró Pieces*, received numerous prestigious awards.

In stark contrast to the scale of Meale's contribution to the Australian art music scene, only a small crowd of 20-30 people gathered for his funeral in Sydney in late 2009. Even a subsequent memorial concert celebrating his music, held at the Sydney Conservatorium of Music in February 2010, attracted fewer than 200 attendees. That one of Australia's greatest composers should be remembered and publicly celebrated by so few speaks to the marginal position occupied by art music in Australia's cultural landscape.

Beyond the scarce attendance, my memories of the funeral also extend to the music which was performed. A group of hastily convened students performed *Cantilena Pacifica*, which forms the final movement of his *String Quartet No. 2* – a work which marked a turning point for Meale, in which he largely rejected the principles of modernism and instead turned to traditional tonality and harmony as the basis for expressive material. Whereas my interest in art music was largely driven by intellectual curiosity, *Cantilena Pacifica* was one of those rare works which I enjoyed at an emotional level. The lyrical straining of the first violin, as it rises over the gradually shifting harmonies emerging from the gentle rocking motif of the lower strings, had left me with an intense feeling of poignancy long before I had heard it performed in the emotionally charged context of a funeral.

Meale is also of personal significance in reflecting on the origins of my interest in contemporary Australian art music. Rather than a story of a transformative encounter with his music, it is a far more mundane one of fulfilling the requirements of a high school assignment. My music class had been tasked with a musicology project on different eras of Australian composition, and we undertook an excursion to the library of the Australian Music Centre (AMC) – an organisation which housed an unparalleled collection of over 20,000 recordings and sheet music of works by Australian composers. As a flutist, I guessed it might be apt to choose Meale's *Sonata for Flute* as the basis for examining modernist trends of the 1960s. It lent itself readily enough to musicological analysis, but as a young performer and listener it was confounding, foreign, impenetrable and of little personal interest. The next year of

high school meant a new assignment and another excursion to the AMC. Instead of musicology, this time the task was to select a contemporary piece for performance. Poring over scores and recordings, I was hooked. What had previously been unappealing in its unfamiliarity had become a source of fascination and intrigue. This personal evolution speaks to the thesis' concern with the multidimensional and multidisciplinary ways in which the concept of distance can be understood and which help render the experience of the unfamiliar as socially and perceptually intelligible.

1.1.2 Taking the art out of art music

Skipping forward to 2019, the AMC was one of over 400 arts organisations which submitted an application for multi-year funding to the Australia Council, the federal government's arts funding body. With as few as one in five applicants expected to be successful (Francis, 2019), organisations entered into the competitive process acutely aware of the need to carefully construct applications which suitably addressed the Australia Council's strategic priorities. For most organisations, failure to achieve the goal of guaranteed four-year funding would pose an existential threat – not only for themselves, but also for the art forms and the livelihoods of the artists they represent.

Having ended up working for the AMC between 2000 and 2011, and still working there in a part-time capacity among other roles in the music industry, I was invited to be part of a working group to prepare their multi-year funding application. The gravity of the submission was reflected in the AMC having appointed an external consultancy to guide and coordinate the development of the application through a series of focus groups, planning workshops and group writing sessions. The cornerstone of the resulting application was a strategic plan which articulated the AMC's goals and ambitions through to 2024.

The primary point of contention among the working group pivoted around what 'music' the Australian Music Centre should concern itself with. Since its inception in 1974, the AMC's mandate had been to serve the interests of composers, but since the 2000s this term was increasingly regarded as too narrow and exclusionary. Contemporary practitioners drew on hybrid stylistic influences; in addition to 'composer', they were identifying as sound artists, improvisers and jazz musicians. The overlapping and myriad roles demanded by the financially precarious nature of

the Australian music scene (Throsby & Hollister, 2003) also placed pressure on practitioners to identify more generally as creative professionals and adopt a more catholic approach to the application of their musical skills. These shifts can be observed in the names given to the AMC's annual awards ceremony and the categories of awards presented. What had been named the Classical Music Awards in 2002 were rebranded as the Art Music Awards in 2011, and gradually included the addition of categories which reflected commercial (as opposed to critical) success, together with awards specifically recognising achievements in jazz and experimental music.

By 2019, the label of 'art music', however, was itself now in question. The Australia Council's strategic goals included references to diversity and inclusion (Australia Council for the Arts, 2014), and the majority of the AMC's working group argued that the organisation could not risk aligning itself with a label which might be interpreted as elitist, narrow and exclusionary. Instead, the AMC would embrace the provision of (predominantly digital) services to 'artists' and 'music creators', without attempting to place explicit style or genre boundaries on the music it represents.

1.1.3 A field in tension

These reflections provide cursory insights into the nature of contemporary Australian art music practice, which is the field of cultural production, curation and consumption at the centre of this thesis. In addition to highlighting some of the tensions which are increasingly unsettling the field, the reflections also touch upon a number of issues and themes which have informed the present study. As a space of cultural production, the definitional crisis in 'art' music points to the ambiguities which disrupt relations between individual and institutional actors in terms of how the art form is legitimately understood. The question of how we might *know* art music as a distinct 'field' – as both an identifiable artistic practice and a bounded social space of position takings – takes on particular relevance at a time of increasing digital mediation. Definitions are disrupted by the amorphous nature of field boundaries and the heterogeneity of practices entailed therein. Beyond internal tensions which beset art music, the second reflection also locates this practice among a broader cultural landscape in which having pretentions to art risks accusations of elitism stemming

from its limited accessibility. Unlike the visual arts in Australia, where the democratisation of high art has been marked by commodification and popular entertainment (McLean, 2020), the corresponding influences in art music have been complicated by the prior existence of popular idioms. The 2018 Pulitzer prize for music was awarded not to a composer or jazz musician, but to rapper Kendrick Lamar, which Hanquinet (2018) suggests points to the 'fragile and dynamic' nature of aesthetics in contemporary music. The unique and conflicted space occupied by this field invites questions pertaining to cultural consumption and how audiences are able to form an attachment to this particular genre of music. As a practice which approaches Bourdieu's (1983, p. 320) notion of a field of 'restricted production', in which producers produce for other producers, Australian art music also presents a context in which there is considerable overlap among, and proximity between, producers and consumers. In terms of the audience segments of Becker's (1982) 'art worlds', the 'innermost circle' of those professionally involved in the arts represents an unusually high proportion of contemporary art music's audience. In analysing how different perspectives of distance contribute to constituting the field, the ways in which composers conceive of and construct the field therefore carry significant influence. Furthermore, it opens up questions of how the social proximity of different actors in a field aligns with those actors' corresponding understandings of distance between producers.

The preceding reflections also point to the practical concern of growing audiences. While the field may enjoy some marginal level of symbolic legitimacy, the small size of its audiences is inescapable. While addressing this represents a key performance indicator for funding bodies evaluating where limited resources should be directed, the challenge of growing audiences is particularly problematic for a field concerned with novel and avant-garde sounds. Not only can works be difficult and off-putting when first encountered – as was my experience with Meale's flute sonata – but processes of listening often favour intellectual modes of appreciation as opposed to more traditional affective pleasures. The marginal nature of art music practice suggests a complementary emphasis on expertise among audiences, which sits awkwardly with official discourses of 'ensuring the arts enrich daily life for all' (Australia Council for the Arts, 2014).

1.2 Research questions

The research questions which are addressed by this thesis emerge from my professional concern for understanding audience engagement with contemporary Australian art music, together with academic research into cultural fields and tastes. As touched upon in the previous reflections, there is a professional concern in the art music sector to develop audiences in a genre which is marked by marginality and ambiguity. Furthermore, the context for this challenge is increasingly being shaped by digital listening environments which involve algorithmic modes of mediating music to audiences. The overall rationale for the investigations stems from a desire to develop new approaches to and insights into the operation of Australian art music, which provides the exemplar cultural field for the study.

In focussing on the key concept of distance in the related contexts of similarity and familiarity, the research questions adopt methodologies which encompass the lifecycle of cultural production and consumption: from the creative endeavours of composers, through to the curation and mediation of that music to audiences, and its ultimate reception and consumption. Previous research has largely focussed on either investigating fields of production (such as the emphasis in Bourdieusian analyses of cultural fields as games of relational positioning played among producers, e.g. Bourdieu, 1983; de Nooy, 2002), or on taking fields as given entities which are the objects of personal taste (as is typically found in studies which take Bourdieu's (1984) analysis of the homologies between social position and cultural preferences as their departure point). Whereas notions of distance are often an implicit aspect of Bourdieusian cultural sociology, this thesis aims to elevate and provide greater scrutiny of how this framing can inform an account of our relationships to culture. My research questions are informed by a desire to explicitly adopt a comparative approach which permits a closer assessment of how mapping a space of cultural production intersects with and informs audience engagement with that field. Instead of separate 'games' of relational positioning, I seek to depart from Bourdieu by examining how the privileged position of cultural producers – mapped by articulating distances among composers – is variously transformed by and drawn upon in processes of curation and consumption. Rather than resolving this dichotomy between production and consumption through approaches which conceive of much

flatter networks of social activity (e.g. Becker, 1982; Hennion, 2007), my approach instead seeks to follow the object of investigation from production through to consumption in a more sequential fashion.

1.2.1 RQ1: How can the field of Australian art music be mapped and modelled as a distinct space of cultural production?

My research is firstly interested in developing new approaches to how we can model, map and understand the field of contemporary Australian art music as a space of cultural production. The salience of this question emerges in particular from the increasing digital and algorithmic mediation of music. Such algorithms encapsulate their own models of the cultural space which they present to audiences, but they do so in ways which are opaque and not neutral. The design of algorithms inevitably involves encoding *choices* made by human beings, yet these decisions are largely invisible to the individuals whom they impact upon (O'Neil, 2016). In the context of recommendation services, algorithms generate and draw upon constellations of artists and their work, which are modelled as spatial relationships of similarity and distance. In doing so, they foreground particular associations and relationships, and disregard others. In addressing this research question, my analysis contrasts different approaches to modelling the field which are afforded by the current era of big data, in order to develop new ways of delineating and knowing a field in tension. These approaches permit mapping the field from different vantage points in the field and develop an understanding of how these perspectives intersect and deviate from each other.

Significantly, my research emphasises mapping Australian art music as a *distinct* field of production. Rather than adopting generic models designed for music more broadly, my interest is in identifying approaches which allow us to map the field on its own terms and which can serve to reproduce the specific dimensions which are relevant to mapping the contours of Australian art music. Responding to this research question is therefore intimately connected to our capacity to engage with and appreciate Australian art music as a distinct and specifically knowable field.

1.2.2 RQ2: How do different platforms mediate the field of Australian art music to audiences?

Having established multiple intersecting spaces of producers, my research is then interested in how contemporary Australian art music is mediated to audiences through curatorial processes. As an art form which places a high level of importance on live performance, it nevertheless exists in an environment which is increasingly dominated by digital music services and where the previously influential role played by radio is diminishing. Each platform – radio, digital playlists and concerts – assembles the space of producers in ways which privilege particular ways of representing the field, and responding to this research question provides an understanding of the different logics of music selection and curation on each of radio, digital playlists and live concert programs.

In addition to dimensions such as gender, nationality and historical era of composition, I also approach this research question through the lens of familiarity in order to establish how different platforms support engaging with music which is distant and challenging. Drawing on a model of similarity and distance established in RQ1, I analyse how the listening environments offered by each mode of presentation provide a different profile of musical heterogeneity and eclecticism. By doing so, my research is able to consider potential threats to Australian art music practice which are introduced as a result of the increasingly digital consumption of music.

1.2.3 RQ3: How do audiences exercise taste in Australian art music?

Whereas the previous research questions seek to establish the context for how notions of distance are represented and presented to audiences, the third research question shifts the focus to how audiences respond to and engage with the field in the process of listening. Doing so entails a corresponding shift from big data to the relatively 'small' data of interviews. In responding to this research question, my analysis develops a nuanced understanding of what is at stake for audiences as they engage with the specific scene of contemporary Australian art music. By considering *why* audiences choose to listen and *how* they articulate their engagement with and form attachments to particular musical works, it complicates the relationship between taste and pleasure.

By analysing how audiences negotiate their responses to specific works, my research shows how audiences draw upon different frames of appreciation in a fluid and contingent manner in order to achieve an affirmation of their taste in unfamiliar music. As with the previous two research questions, the focus on contemporary art music permits this theme of familiarity to be foregrounded. As a field which emphasises and embraces novel and unexpected sounds, the music presented at such concerts has been shown to confound the majority of concert attendees (Menger, 2017), and the research question seeks to resolve this paradox by identifying how audiences form an attachment to the unfamiliar.

1.2.4 RQ4: How do audiences respond to unfamiliar Australian art music in the digital environment?

The final research question directly considers the issue of familiarity in respect to audience engagement with Australian art music in the digital environment. Whereas considerable research has explored how notions of familiarity and preferences are intertwined, such a nexus limits exploring how we might understand audiences' engagements with *unfamiliar* cultural content. My exploration of this research question again draws on the previously established models of distance and similarity to develop a more fine-grained understanding of the operation of musical taste. In particular, it develops mixed effects models which establish how familiarity, modes of appreciation and the affordances of particular musical styles intersect to predict positive affective responses to music recommendations. The focus on digital listening contexts further allows its findings to contribute to the design of recommendation algorithms which encourage audiences to go beyond their comfort zones.

1.3 Situating the research

In addition to the professional concern of engaging audiences with Australian art music, the themes of distance, similarity and familiarity in the production and consumption of culture which are examined in this thesis also emerge from, and form a dialogue with, research in a range of academic disciplines. The discussion in this section of relevant literatures locates the thesis within these broader research contexts and concerns, with each of the subsequent empirical chapters then providing a more

detailed engagement with literature specifically relevant to the research questions being examined.

1.3.1 Mapping fields of cultural production

The very notion of a 'field of cultural production' stems from Bourdieu's (1983) eponymous paper, which also formed the title for his collected edition (Bourdieu, 1993) on the French literary and artistic fields. A primary concern for Bourdieu in his analysis of the structure of such fields is their relationship to the broader field of power, and the historicisation of how hierarchies of legitimacy are established and transformed. As an example of his approach, his map of the French literary field in the second half of the 19th century (Bourdieu, 1993, p. 49) establishes a two-dimensional *space* defined by poles of legitimacy and autonomy. Legitimacy refers to how consecration is bestowed on a practice (e.g. by producers, by 'bourgeois' taste, by consumer culture), whereas autonomy reflects the degree of independence from external forces and demands. Within this space different forms (e.g. poetry, novels, drama), schools (e.g. Symbolists, Decadents), genres (e.g. psychological novel, rural novel) and audiences (e.g. intellectual, bourgeois) are then able to be relationally located. In this context, distances – reflecting processes of relational distinction and their varying proximities – are fundamental to the conception of the field.

By focussing on the objective relations of fields as a dynamic struggle of positions and position-takings, Bourdieu (1993, p. 34) aimed to overcome approaches to accounting for fields which sought their explanation in either internal and external causes. Whereas the former corresponds to 'tautegorical' explanations which refer only to the system of works to which it belongs (as is commonly found in musicological analysis), external explanations reflect an 'allegorical' approach which relies only on analysing the social conditions of production (as in the work of Adorno (1973) and McClary (1991)). A consequence of this focus on position-taking is that empirical work adopting a Bourdieusian lens of field analysis places its emphasis on the role played by actors central to the field's production. In his investigation of positions in the Dutch literary field, for example, de Nooy (2002) takes the relationships between authors and literary magazines as its empirical focus. In doing so, the structure of his chosen field is explained in terms of struggles over prestige

and legitimacy among the field's creators and its mediating publishing institutions. The spatial positioning of creators – and the distances between them – are central to Bourdieu's understanding of the nature of artistic fields. In linking positions to the possession of capital, Bourdieu (1993, p. 30) conceives of 'fields of struggles' in which actors seek to improve their position, and in which meanings emerge from *distinctive* relationships with the field.

In emphasising relations of power, Bourdieu's approach to field analysis is significant for the way in which it draws attention to the relationship between a field's autonomy – its capacity to disrupt the laws which otherwise govern the broader field of which it is a part – and its capacity to exist as an identifiable and discrete practice. This aspect of Bourdieu's approach is central, for example, to the approach of Dubois, Méon, and Pierru (2016) in their investigation of the status of wind bands in contemporary France. Situated in a precarious position, between amateur provincial music and consecration into serious music, it is the threatened capacity for wind bands to follow an autonomous logic, independent of dominant musical conventions, which constitutes an *existential* crisis for their practice. A similarly precarious position can be observed in the identity crisis facing Australian art music (as discussed in 1.1.2 above), whereby it is caught not only between poles of high/low cultural legitimacy but also between what Bellavance (2008) considers to be an under-acknowledged structuring principle of old/new: a connection to art music's historical lineage against its need to espouse its contemporary edge.

In contrast to a focus on core actors in mapping a field, Becker's (1982) conceptualisation of 'art worlds' instead turns to a wider frame of participants – still predominantly from a viewpoint of 'production' – as involved in the constitution of fields. Drawing on a social interactionist framework, Becker conceives of fields as the coordinated efforts of diverse actors – including the 'support personnel' such as technicians and accountants – who must collaborate through a negotiation of shared interests and in a manner constrained by conventions. In the field of art music, these conventions can be observed as extending to the prevailing standards and technologies of documentation in information systems through which music is able to be known and engaged with by audiences (Chambers, 2007). In shifting the lens of

analysis from objective relations to social interactions, Becker's approach serves to undermine any attempt at establishing a priori boundaries as to the definition of a field; in rejecting spatial metaphors which can be mapped, this is replaced, instead, by a network of associations. In focussing on "groups of people who cooperate to produce things that *they*, at least, call art" (Becker, 1982, p. 35, emphasis added), the approach of art worlds also permits greater attention to be paid to marginalised practices and struggles over the very honorific of 'art' (or the specific label of 'art music') within creative fields.

The conceptual differences between Bourdieu and Becker in how they analyse the structure of cultural fields is reflected in their respective methodological approaches. In explicitly rejecting Becker's approach by arguing that fields are not reducible to 'simple relations of interactions' (Bourdieu, 1993, p. 35), Bourdieu's interest in the dynamics of power instead led him to employ the relational approach of multiple correspondence analysis (MCA) as suitable for identifying the 'objective relations' responsible for structuring fields. Becker, conversely, adopted ethnographic methods for tracing the collaborative efforts involved in constituting art worlds. As Bottero and Crossley (2011) observe, however, both theories have eschewed any engagement with the techniques of social network analysis (SNA), which offer considerable scope to empirically interrogate field relations. While Bourdieu's rejection of interactions as the relevant focus of empirical analysis makes his ambivalence towards SNA understandable, Becker's reticence is less obvious, with Bottero and Crossley pointing to his suspicion of imbuing his metaphor of networks with any unfounded solidity.

The opportunities presented by SNA for mapping artistic fields has been explored by a range of empirical research which includes both synchronic and diachronic investigations. McAndrew and Everett (2015), for example, analyse the interactions between composers of British classical music to not only identify different spheres of influence and clusters of activity in their mapping of the field, but also consider how network relations are able to be incorporated into models which predict artistic success. SNA has also been used to analyse trajectories of artists and the evolution of creative practice in local fields such as jazz in the United States (Kirschbaum, 2017), photography in New York (Giuffre, 1999) and post-punk music in Britain (Crossley,

2015). In doing so, SNA is able to draw on the interactionist concern for concrete relationships between actors to map spaces of artistic production. Its concern for concepts such as centrality and prestige mean that it is able to be attentive to dynamics of power which echo Becker's interest in marginalised practices and struggles over legitimacy. Network analysis approaches, therefore, offer an emerging approach in the analysis of cultural fields with the potential to bridge otherwise contrasting conceptual approaches to our understanding of the contours of cultural production.

1.3.2 Fields of cultural consumption

Conspicuous by its absence in the preceding discussion of fields of cultural production is the place afforded to the audiences and consumers of a field's artistic works. In addition to the potential for audiences to influence processes of artistic production, Lahire (2014) draws attention to the implications which follow for Bourdieu's (1984) subsequent conceptualisation of consumption which dominates his treatise on cultural tastes in *Distinction*. Lahire argues that Bourdieu's neglect of audiences amounts to ascribing them to their position in various fields of power, as reflected in their relational cultural attendance patterns. By conceiving of fields of production which inscribe cultural codes in their works, Bourdieu's sociology of cultural consumption becomes limited to one of the acquisition of cultural competency and the mastery of codes (cultural capital) acquired in socialisation (habitus). In doing so, for Lahire, Bourdieu fails to escape from approaches which locate the meaning of works in the works themselves as opposed to in the mediated encounter between work and audience.

In addition to issues of agency and meaning in artistic consumption, the limitations of Bourdieu's approach are of particular relevance to my thesis' concern with the unfamiliar. While Bourdieu appears to acknowledge the potential for multiple and contradictory meanings which musical works are capable of taking on in different contexts for different social agents (Bourdieu, 1984, p. 19), this variation occurs within the boundaries of knowledge of the code. For music which is outside the norms and codes of a field (as is frequently the case in the avant-gardism of contemporary art music), or for audiences which do not yet possesses the codes (as

will be the case for many niche fields of artistic practice), this leaves the analyst unable to describe and analyse such practices without recourse to a discourse of cultural poverty (Lahire, 2014). Familiarity and taste become intertwined in a manner which largely precludes theorising engagement with the unfamiliar.

In contrast to the homology between social space and cultural tastes found in *Distinction*, a considerable body of research has instead posited the emergence of omnivorousness as constituting a new form of socially distinctive consumption. Pioneered by Peterson (1992), the cultural omnivore suggests a consumer capable of appropriating works across the hierarchy of cultural legitimacy, and places them in opposition to univores who limit their consumption habits to a narrow repertoire of cultural tastes. Studies identifying this new category of consumption have focussed particularly on musical tastes (e.g. Peterson & Kern, 1996; Savage & Gayo, 2011) and conceive of a consumer with a cosmopolitan sensibility who valorises eclecticism (Fridman & Ollivier, 2004) in a manner which is far more promising for audience engagement with unfamiliar music. For the omnivore, distance becomes something which is valued and appreciated rather than forming a barrier to the formation of tastes.

The rise of the cultural omnivore, however, has been far from uncontested. Friedman (2012), for example, questions the typically positive and celebrated conception of the omnivore as a high status liberal-minded citizen, while Rimmer (2012) takes issue with the underlying methodological approaches to defining genres and assigning cultural legitimacy as being anachronistic when compared with increasingly fluid conceptions of genre. The different approaches to operationalising omnivorousness were examined by Robette and Roueff (2014), who found they were able to vary the estimated frequency of omnivorousness in the French population from 1.7% to 30.9% depending on choices made in research design. In particular, the need to distinguish between *knowledge* of diverse musical forms, as opposed to *enjoyment* of diverse musical forms, was identified by Bennett, Emmison, and Frow (1999, p. 194) in the interpretation of their findings on Australian musical tastes in the 1990s. While Bourdieu identifies different modalities of enjoyment in consumer tastes, both hedonistic and refined, in both cases it remains the non-calculating pursuit of *pleasure*

– as opposed to possession of knowledge – which is necessary for acts of cultural taste.

Beyond methodological concerns, research into cultural consumption which focusses on patterns of preferences for different musical forms – as exemplar works, or musical genres – is also a source of conceptual critique. In defending Bourdieu from his critiques, Holt (1997) considers such research misplaced in its operationalisation of taste in *objectified* rather than *embodied* forms. Rather than uncovering heterogeneous consumption at the level of Bourdieu's (1984, p. 172) '*opus operatum*', a number of researchers have instead sought to return the focus to the generating principles – the '*modus operandi*' – which give rise to the objects of taste (e.g. Schwarz, 2013; Jarness, 2015; Michael, 2015). In contrast to the logical impossibility of audiences having formed an habituated *opus operatum* for unfamiliar cultural forms, a focus on techniques of consumption is therefore of particular interest to this thesis' concern for audience engagement with unfamiliar music. In addition to qualitative research identifying typologies of consumers who display different forms of openness to cultural forms (e.g. Ollivier, 2008), other studies have sought to quantitatively identify different modes of cultural consumption (e.g. Daenekindt & Roose, 2014; Hanquinet, Roose, & Savage, 2014) and their potential basis in different processes of socialisation (Schwarz, 2013).

Theorising the social space of cultural consumption with respect to tasting techniques is therefore both conducive to investigating unfamiliar cultural content, and avoids conceiving of the meaning of works as inherent in the works themselves. While this affords works more open and divergent meanings, approaches in the sociology of music which draw on the 'practice turn' (e.g. Hennion, 1997; DeNora, 2000; Hennion, 2001; Born, 2011; Varriale, 2015) have sought to take this a step further by emphasising music as an accomplishment achieved through a set of actions and mediations in which the music fan 'co-produces' and constitutes the work. Rather than broad typologies of consumption techniques, the emphasis turns to ethnographic modes of investigation to trace the ways in which audiences appropriate and derive utility from music in their everyday lives. While there may be an unconscious element to the dispositional nature of tastes, this approach echoes Latour (2005) in

emphasising taste as a *reflexive* activity which does not need to be explained by an analyst's privileged recourse to the hidden forces of social theories.

Empirical work which draws on such a sociology of attachment can be seen in Benzecry's (2011) ethnographic research into the practices of opera fans frequenting the upper floor of Buenos Aires' Teatro Colón. Rejecting the suggestion that opera attendees are attracted to its status as 'legitimate' culture, he instead foregrounds the cultural object itself, in all its diversity, to understand how his audiences experience, perform and embody the activity of being an opera fan as a mechanism for agency and what Frith (1996) would regard as music's capacity to produce identity. While Benzecry only briefly addresses processes of initial familiarisation with opera as a novel genre which is initially unfamiliar to his participants, the genesis and formation of taste is the explicit focus of Lembo (2016) in her examination of late-in-life acquired musical tastes. By drawing on Dewey to go beyond what she perceives as Bourdieu's over-emphasis on stability in musical taste, Lembo's approach is particularly useful for considering unfamiliar music and the 'moments of disjuncture' and reorientation which are associated with developing novel tastes.

1.3.3 The materiality of cultural fields

As part of the 'practice turn' in the sociologies of art and music, and the socially inflected mediations which shape audience engagements with works, there has been an acknowledgement of the need to adopt approaches capable of addressing the specificity of artistic and cultural works. In this critique, the approach of critical sociology is regarded as reflecting a 'radical lack of concern for the works themselves' (Hennion, 2012) in which objects of art are reduced to 'arbitrary stakes' in the analysis of social forces (Hennion, 2015, p. 2). While seeking to avoid a return to approaches which locate meaning purely in the works themselves, research has instead sought to restore the material properties of works by focussing on the encounter between the dispositions of social actors and the properties of cultural objects (e.g. Varriale, 2015).

A complication to embracing the materiality of music, however, stems from the challenge of articulating its material specificity without recourse to generic genre labels. Bourdieu (1984, p. 80) regarded music as the most 'spiritual' and 'pure' art

form, with the corollary that it is 'below words' in a manner which disrupts attempts at the discursive articulation of its properties and their bodily effects. In contrast to analysing the physical materiality of works of visual arts (e.g. Dominguez Rubio & Silva, 2013), the intangible and abstracted acoustic nature of music presents unique obstacles to sociologists seeking to engage with its specificities. Hennion (2012) highlights this elusiveness of music by declaring that it has 'nothing but mediations to show'; the *works* are not there to examine but are investigated through instruments, musicians, scores, recordings and discourse.

The acoustic properties of music have, however, been a long-standing object of interest in the field of music psychology. Studies have examined the cognitive, affective and emotional perception of low-level music features such as pitch (Leung, 2017), intensity (Dean, Bailes, & Schubert, 2011) and repetition (Margulis & Simchy-Gross, 2016). While the social dimensions of such research are largely partitioned with respect to concepts such as expertise and cross-cultural communication, they nevertheless point to new methodological and conceptual approaches for considering the materiality of music. Of particular conceptual relevance to this thesis are studies from music psychology which postulate a relationship between affective preference and the properties of music. Berlyne's (1971) influential work on the role of the limbic system in producing reward effects, for example, postulates an inverted-U model for predicting preferences based on optimal levels of arousal stemming from measures of music's perceived complexity and familiarity. As with sociological theories of the homology of taste, however, such approaches which foreground notions of familiarity in explaining preference – by way of mechanisms such as prototypicality (e.g. Martindale & Moore, 1988) or mere exposure effects (e.g. Witvliet & Vrana, 2007) – are limited with respect to their explanatory power for engagement with *unfamiliar* music. The perspectives of music psychology and cognitive prototype theory do, however, offer alternate framings for how distances – in terms of 'similarity' – translate to familiarity and the unfamiliar. It is the perceptual material qualities of the music itself, and the relative proximity to music experienced, which provides individual listeners with the capacity to derive meaning and affect.

1.3.4 The digital mediation of cultural fields

In addition to the mediations of recordings, instruments, publishers and the media which are the primary foci of Hennion, the advent of digital music streaming services in the second decade of the 21st century introduces a significant new mediation for audiences engaging with music. Not only does it offer a new technology for listening and consumption, but it also represents a transformation in the accessibility of musical culture and an era of algorithmic curation which shapes processes of how music is discovered, heard and understood. The speed of this transformation should not be underestimated, with digital sources accounting for over 37% of all music performing rights revenue collected in Australia and New Zealand in 2018/19 – dwarfing traditional media such as radio at just 9.7% (APRA, 2019). For contemporary art music, as a practice whose audiences have typically given far greater prominence to live music concerts over recordings (Dobson, 2008), this shift in consumption patterns represents a particular challenge for its capacity to remain visible and viable.

As a consequence of the digital mediation of music, the traditional cultural intermediaries of artistic producers, publishers and radio programmers are now joined by software engineers and their algorithms. Increasingly, the circulation of cultural goods is achieved through processes involving non-human agents whose legitimacy rests on the efficacy of algorithms and the collection of massive datasets covering both music and users. In coining the term 'infomediary' to refer to these new technology-enabled logics, Morris (2015) argues that they are both non-neutral and represent a disruption to the evaluative practices of traditional intermediaries (which had recourse to discourses of aesthetics), by instead locating value in an algorithm's capacity to fit recommendations within existing individual user preferences. Indeed, the notion of providing accurate recommendations which correspond with a user's existing taste profile represents the dominant approach to evaluating recommendation systems (Aggarwal, 2016, p. 229). From the perspective of audiences, this risks the propagation of filter bubbles, in which users are exposed to a relatively homogeneous range of musical content, and the likelihood of engaging with unfamiliar music becomes more remote. For creative producers, it similarly risks

creating ghettos of musical practice – as evidenced by the high proportion of songs on Spotify which have never been listened to (Palermino, 2014).

In the face of these shortcomings and the often low regard for algorithms to support music discovery (Kjus, 2016), the heterogeneity of content suggested by recommendation services is a topic which is receiving increased attention in music information retrieval (MIR). In addition to the development of approaches which increase the heterogeneity of recommended items (e.g. Karakaya & Aytekin, 2017; Lhérisson, Muhlenbach, & Maret, 2017), research has also demonstrated that users prefer and value systems capable of suggesting music which has a higher perceived degree of diversity (Ferwerda, Graus, Vall, Tkalcic, & Schedl, 2017). Whereas such studies have focussed exclusively on consumption of popular music forms, the capacity for algorithms to support the recommendation of unfamiliar content from niche fields remains a gap which is explored in the context of this thesis.

1.3.5 The field of contemporary (Australian) art music

Having reviewed a range of research relevant to the sociological investigation of cultural production and consumption, this literature review concludes by considering research which has engaged with the specific niche musical context examined in my thesis. While Australian art music and its composers have been a frequent topic of traditional musicological research, examples of sociologically-inflected analysis into this field are more difficult to come by. Research stemming from popular music studies has touched on issues of cultural legitimacy (Homan, 2013) and popular music festivals as sites of consumption and identity formation (Cummings, 2007), but even the broader field of classical music in Australia has rarely been a prominent subject of research outside of audience participation studies produced by government arts funding bodies (e.g. Australia Council for the Arts, 2010). The place of classical music in the context of broader structuring principles of tastes in the Australian music field has, however, featured in national surveys of Australian cultural fields (Bennett et al., 1999; Bennett, Carter, Gayo, Kelly, & Noble, 2020). The 1999 study, for example, found that the homology thesis proposed by Bourdieu to account for tastes in 1960s France was, by and large, able to be identified in the Australian context, albeit with an exaggerated skew towards musical forms with ‘diminished aesthetic

value' (Bennett et al., 1999, p. 199). Such findings emphasise the ambiguity around hierarchies of legitimacy which are particularly pertinent to the current thesis' focus on contemporary art music. The inability for such research programs to distinguish between the internal divisions of classical music, however, represents one of the theoretical gaps which is addressed in the course of my research.

An exception to the dearth of research into contemporary Australian art music is found in Griffiths' (2003) analysis of chamber music and arts policy in Australia. In developing a portrait of audiences and the policy challenges to growing them, Griffiths confirms the stereotype of classical music audiences as being older, more urbane, wealthier and more highly educated than population averages. In response, she argues that the only meaningful way of addressing the small size of audiences in Australia is through 'democratisation of access' in the form of policy measures aimed at fostering the acquisition of cultural capital, thereby enabling participation. This formulation of a recourse to Bourdieu overlooks the structuring processes of distinction in the homology of tastes, but also involves a defence of 'high culture' as a qualitatively different (and, by implication, superior) cultural form which underscores her arguments. Given this interest in protecting the elevated status of art music, it is perhaps unsurprising that sociological analyses of art music are relatively uncommon. In identifying the divide between musicological and sociological approaches to music, Martin (1995) notes that the latter is sceptical of regarding any particular tradition of music as having any inherently privileged position or value. While my own thesis has emerged from a long-standing personal and professional involvement in art music, including a vested interest in the ongoing health of the art form, it nevertheless departs from Griffiths in adopting a more circumspect relationship to its chosen object of research.

Despite the limited research on the Australian context, art music has received considerably more attention in other national contexts. France, in particular, has attracted a program of research which stems in no small part from the significant influence of the composer Pierre Boulez. In addition to his founding role at IRCAM and leadership of the musical avant-garde (Born, 1995), Boulez's foundation of the Ensemble intercontemporain (EIC) indirectly led to a range of research into art

music[1] and its audiences. As one of the world's leading contemporary art music ensembles, the EIC has a long-standing program of audience research and ensuing collaboration with academia. As a result, studies by researchers such as Menger (1986, 2017) and Dorin (2013, 2018) have been able to provide analyses of the nature of art music and its audiences, together with its longitudinal evolution. While the French context is not directly transferrable to Australia, their research nevertheless draws attention to a number of idiosyncrasies which permeate art music practice and are relevant to the current thesis. Menger (2017), for example, identifies a disposition of 'benevolent asceticism' among audience members who are largely incapable of distinguishing between the myriad schools of art music – suggesting a strategy of consumption which audiences adopt in the unusual situation where unfamiliarity with the object of taste is customary. Drawing on the concept of the omnivore, Dorin (2013) distinguishes between 'constrained' and 'elective' forms of omnivorism among EIC audiences, which reflect different trajectories of capital accumulation and class positions. In identifying structuring principles of taste for this niche cultural field, this research invites the question of the extent to which observations made in the cultural milieu of contemporary France are reflected in the Australian context. Furthermore, it poses questions of *how* this distant and ambiguous music is variously appropriated and enjoyed by audience members.

1.3.6 Summary

The literature and research canvassed in this review reflects a wide range of disciplinary and theoretical approaches, spanning not only contrasting perspectives and foci within sociology, but extending to music psychology, musicology and music information retrieval. Together they provide a rich source of conceptual, methodological and empirical findings with which my thesis forms a dialogue in investigating its research questions and central themes of distance and familiarity. In the context of the diverse investigations undertaken in my thesis' empirical chapters,

[1] The French language is not without the ambiguities which plague labelling this artistic practice in English. I translate the French term 'la musique savant' as 'art music', however it has also been variously translated as 'serious music', 'intellectual music' and 'scholarly music'. As part of 'la musique classique' (classical music), it subsumes 'la musique contemporaine' (contemporary music). In English this latter term is more likely to refer to non-classical idioms which in French can be distinguished as 'les musique actuelles'.

each of which selectively foregrounds and further engages with this literature, the review also provides an important overview of the theoretical concerns which cohere its exploration of distance in the context of contemporary Australian art music. Finally, the review also points to a number of gaps which this thesis aims to address. Audience engagement with unfamiliar culture generally, and Australian art music in particular, under theorised, inviting new avenues for enquiry as to how and why these distances are bridged by listeners. Furthermore, in the gaps between the objective relations of Bourdieu and the interactionist networks of Becker, there are new methodological opportunities – enriched by a return to the acoustic materiality of the music itself – through which we can examine the dynamics of fields of cultural production.

1.4 Epistemological conditions of investigating taste and cultural fields in an era of 'big data'

When Bourdieu (1984) conducted his analysis of the cultural practices of French society, he amassed what was, for the time, an impressive and innovative array of data and analytical tools. The 39 questions of his survey provided a demographic profile of his respondents, together with detailed information on their cultural preferences in categories ranging from home furnishings to the visual arts. Over the course of two tranches, in 1963 and 1967-68, the survey was administered to 1,217 participants in Paris, Lille and an anonymous small provincial town. In addition to interviews with a sample of respondents, he supplemented his own survey with data from the French national statistics bureau (INSEE) and surveys commissioned by each of the Ministry of Culture and a professional media industry body[2]. Together with his colleague, statistician Jean-Paul Benzécri, his subsequent analysis of this dataset involved pioneering work in the application of correspondence analysis to the social sciences. His broadly influential research uncovered coherent sets of preferences which he identified as stemming from "distinct and distinctive systems of dispositions" (p. 261).

[2] Bourdieu obtained access to two surveys commissioned by the Centre d'études des supports de publicité (CESP) which targeted respondents in professional occupations with a range of questions pertaining to their cultural practices and media habits.

Fifty years on from Bourdieu's data collection, the Australian Cultural Fields (ACF) project (Bennett, Carter, et al., 2020) represents a contrasting study undertaken in a new national and temporal context. A telephone survey of 1,461 participants across Australia asked 93 questions covering demographics and preferences across six cultural fields: television, sport, music, heritage, visual art and literature. This data was supplemented by interviews with sector specialists and 42 survey respondents, together with data from the Australian Bureau of Statistics (ABS) and surveys commissioned by each of the Australia Council and a consumer market research company. The approach to analysing the quantitative data was based on the same multiple correspondence analysis (MCA) techniques developed by Bourdieu and Benzécri, with the addition of cluster analysis techniques to strengthen the visual presentation of the findings.

Notwithstanding the fact that ACF was explicitly inspired by Bourdieu's methodological and conceptual framework, it is nevertheless remarkable to observe the similarity in approach between studies whose data collection is separated by half a century. While a range of techniques has emerged which build upon the work of Bourdieu, the original methods found in *Distinction* continue to have currency in major research projects in cultural sociology. My own involvement in the ACF project as a research assistant, however, was part of my motivation to consider alternative approaches to the production of knowledge. Not only have there been substantial shifts in the production and consumption of culture which have emerged in contemporary society, but there has also been an explosion in statistical techniques for the analysis of the vast quantum of data which is now available to researchers.

In acknowledging the legacy and contribution of such Bourdieusian research, a key starting point for this thesis was to consider how I might go about investigating and understanding a specific cultural field in a manner which reflects and takes advantage of the opportunities afforded to contemporary researchers in cultural sociology. Rather than replicating the particular research questions of the relations between social structure and cultural preferences, this thesis is in one sense exploratory and opportunistic in considering the avenues of enquiry which are opened up by and able to be explored with access to new datasets and techniques. In another sense, such

exploration illustrates the capacity to produce new understandings of distance and represent an epistemological opportunity. The thesis also takes the constructed nature of fields as a primary concern. Instead of the macro level field of 'music' which supposedly presents itself to the researcher, the problematic of how a researcher constructs the field in question becomes a more substantial and practical issue with which to engage. This is particularly the case when the field is small, local, and itself mired in definitional contestation, as noted in Section 1.1 above.

Against this backdrop, the following sections describe the epistemological conditions, both empirical and theoretical, that variously constrain and make possible the unique nature of the research presented in this thesis. Whereas the era of big data promised untold potential for researchers, the fits and starts of my thesis instead point to the challenges faced by academic researchers in the context of the present-day environment in which the richest sources of data are increasingly held by private commercial interests. In situating how the thesis responded to the unique digital environment in which it was conducted, this section also provides context to the diversity of methodologies which are employed and described in further detail in each empirical chapter. This diversity, which is detailed in each empirical chapter, is itself one way of responding to this fluid digital context by adopting an exploratory and opportunistic approach to analysis.

1.4.1 Music in the era of big data

The dramatic growth of digital streaming services has opened up new ways for audiences to engage with musical culture. Instead of the musically limited terrain of recorded music purchases, mix tapes, radio and live gigs – and the relatively local social worlds they entailed – people now have instant, on-demand access to libraries of over 30 million songs and are connected to global music communities. The exponential uptake of these services, and the scale of their growth, is reflected in the increase in royalty revenues collected by the Australasian Performing Right Association (APRA), which saw royalties received from digital streaming licensees such as Spotify grow 350-fold in seven years, from $0.3 million in 2011/12 to $105 million in 2018/19 (APRA, 2019).

This trend towards the digital consumption of music is accompanied by a corresponding wealth of data, spanning detailed metadata on the content being delivered, information on the users of the digital music services, and the patterns of usage arising from their interaction. As Hanquinet, O'Brien, and Taylor (2019) note, there is a suggestion of a 'coming crisis' for the traditional survey methods which cultural statistics have relied on when faced with this new profusion of data. Taken together the various types of data reflect the extent to which music has entered the era of 'big data', which boyd and Crawford (2012) portray as a phenomenon which involves the interplay of large datasets and technological processing power. In addition to the patterns which can be identified and the ability to make claims in spheres ranging from the technical through to the social, boyd and Crawford (2012) also draw critical attention to the 'mythology' which surrounds big data. They warn against a blind belief that this era offers a higher form of knowledge which is necessarily both more objective and more accurate. In considering the research opportunities which are promised by the contemporary abundance of data and computational power, it therefore remains imperative to be mindful of the limitations and biases they have the potential to introduce. By 'triangulating' how the field of Australian art music is *variously* understood, the approach taken in this thesis serves to moderate the mythologising capacities which can emerge from the analysis of large datasets. Furthermore, the findings from Hanquinet et al. (2019) point to the value of big data as lying in its capacity to support nuanced insights in the *specificity* of particular art forms – such as the present interest in contemporary Australian art music – which are otherwise flattened in the approach of large-scale social surveys such as the Australian Cultural Fields project.

1.4.2 Returning to the work Itself

An opportunity presented by this era of big data is for research to redress the limited attention which has often been given to the particular outputs of cultural production. The tradition of critical sociology often comes under criticism – not just from the obvious corners of the humanities and musicology, but also from sociologists who reflect the 'material' turn (e.g. Benzecry, 2011; Hennion, 2012; Dominguez Rubio & Silva, 2013) – for reducing musical works to mere conduits for broader social forces. Such critiques are also commonly made in the context of comparing 'rich' qualitative

investigations with quantitative analyses which, supposedly by their nature, are required to forgo a corresponding level of fidelity with the works themselves. The growth of digitised collections of music, however, suggests opportunities for quantitative approaches to embrace some form of a 'return to the work'. The comprehensive material output of the field can itself be subjected to analysis, which can, in turn, be used in subsequent research into how audiences interact with particular musical works. This is not to suggest that the nature of interactions should be reduced to the work itself, but that the mediations between work and listener can permit greater consideration of the work's specificity.

In examining the digital footprint of a cultural field, challenges arise in both delimiting the boundaries of the field, and in then enumerating the works which fall within that boundary. My research interests were not just in the specific sub-field of Australian contemporary art music, but also in considering aspects of how this practice fits within the broader field of music more generally. The former presents the challenge of defining and delimiting a sub-field for enquiry, while the latter faces issues of being suitably exhaustive. My approach to resolving the scope of Australian art music was to draw on an institutional definition. As a niche and marginal field, much of its music does not feature in the databases of large commercial music providers; instead, the largest repository of recordings is held by the Australian Music Centre (AMC). Not only does the AMC hold over 14,000 digitised recordings of discrete musical works, but my personal connections to the organisation also provided an opportunity to overcome the non-trivial consideration of access to the collection of digital objects.

The decision to adopt an institutional definition of the field was not taken without regard for the implications this entails. Where research involves selecting musical data to form the basis of investigations into the nature and contours of a field, the decisions of the researcher inevitably contribute to defining a particular version of that field. As is shown in the debates on terminology in Section 1.1.2, the AMC is itself situated and invested in positionings over what is and is not included in the domain of Australian art music practice. From the perspective of Bourdieu's (1992) theorisation of the structure of artistic fields, the AMC can be taken to represent an

orthodoxy, which aims to systematise and normalise a doxic understanding of the field, but which is inevitably doing so alongside competing possibilities which pursue their own framings of what constitutes Australian art music. To the extent that my research can be said to involve a return to the work, I am therefore cognisant that it returns to *particular* works. The strategies I used to mitigate this limitation were to incorporate datasets which go beyond this exclusive definition (e.g. APRA[3] and ABC Classic FM[4]) elsewhere in my research and through qualitative work which allowed for open-ended reflection on what constitutes the Australian art music scene.

Turning to the broader field of music, the challenge of returning to the work shifts to the overwhelming quantity of music available. In April 2018 the catalogue of Apple's iTunes service alone contained over 71 million songs. Selecting a random sample may suffice for particular analytical approaches, however others – such as responding in real-time to musical interests nominated by participants, or calculating the statistical differences between artists – require ensuring maximum coverage of different artists and of works by each artist. It is also necessary to acknowledge that while a repository of this size might be expected to be exhaustive, just as it has blind spots with regard to its coverage of contemporary Australian art music, it will inevitably exhibit similar omissions with respect to other niche musical practices with limited commercial exploitation. The user-generated content model of YouTube, for example, was responsible for 47% of all on-demand music streaming in 2018 (ifpi, 2018) and is likely to represent a greater source of musical diversity compared to the record label and aggregator dependent models of Spotify and Apple. Without access to YouTube's library of content, I respond to this issue by taking the concept of 'graceful degradation' from computer programming and applying it to my research instruments. In circumstances where the more limited musical coverage of services to which I did have access, such as Spotify and iTunes, might have constrained

[3] The Australasian Performing Right Association (APRA) is a collective rights management organisation which represents the interests of its composer, song-writer and publisher members.

[4] ABC Classic FM (now known as ABC Classic) is the classical music radio network of the Australian Broadcasting Corporation (ABC), which is Australia's national broadcaster.

participant responses, I used an approach of being able to identify this anomaly and implement less feature-rich functionality in place of the original intended analysis.

Beyond enumerating the extent of musical works in broad or specific fields, I was ultimately concerned with obtaining data capable of describing each work in detail. The mode of musical analysis I employ in this thesis primarily draws upon the techniques of acoustic feature analysis found in music psychology and music information retrieval disciplines (Siedenburg, Fujinaga, & McAdams, 2016). Rather than high-level categorisations which have developed (contested) applications in particular contexts, such as 'genre', acoustic feature analysis instead provides low-level statistics summarising a range of descriptors derived from the audio signal encoded in digital music files. Hundreds of such features can be discerned for an individual work and they span attributes associated with rhythm (e.g. beats per minute), tonality (e.g. chord progressions), timbre (e.g. spectral envelope) and more. As the acoustic fundamentals of sound, they are typically used as the inputs for machine-learning to train the recognition of higher-level categorisations (e.g. Tzanetakis & Cook, 2002).

1.4.3 Relying on third-party services in research

When this research project began in 2016, the challenge of developing a comprehensive database of musical works and their usage seemed eminently achievable. Digital music services such The Echo Nest and Last.fm provided public interfaces which supported retrieving detailed information on musical works and the digital traces left by individuals who had explicitly authorised a researcher to track their listening habits. In contrast to settling for analysing *stated* musical preferences – which was commonly the approach of sociological investigations of taste – the era of big data promised unobtrusive and detailed access to actual listening behaviours.

The reality of cultural research which draws upon third-party services is, unfortunately, a far cry from a digital utopia and instead demands persistence, flexibility and constant updating of technical skills. Not only has the quality of the data underlying repositories of musical metadata been questioned (Eriksson, 2016), but the public availability of services is increasingly at the whim of commercial entities. Shortly after commencing my research, for example, The Echo Nest – which

had been acquired by Spotify in 2014 – shut down its application programming interface (API) and required developers to move to Spotify's own API product. Whereas The Echo Nest had often been used in the service of academic research (e.g. Bertin-Mahieux, Ellis, Whitman, & Lamere, 2011) and was utilised by commercial competitors to Spotify such as Rdio and Deezer, Spotify's API was unashamedly designed to support third-party applications which pushed more user engagement with Spotify services.

The implications for my (and others') research were substantial and required both shifts in research questions and the pursuit of novel solutions to overcome newly introduced limitations. The goal of collecting digital traces through 'scrobbling' listening habits via Last.fm became impossible due to instabilities in its integration with different digital music services. Previous research has amassed and published datasets of listening habits retrieved using this method gathered in 2013-14 (Schedl, 2016), however Vigliensoni and Fujinaga (2017) acknowledged that their own dataset had to rely on undocumented and deprecated methods which are no longer supported. The goal of amassing a comprehensive database of musical metadata and acoustic features was still possible, but required increasing technical complexity. As Spotify's API did not support the capacity to iteratively enumerate each of the tracks in its catalogue of musical works, I turned to seeding API song searches with titles listed in the public MusicBrainz database (MetaBrainz Foundation, 2019). Metadata on 41 million songs and 2.8 million artists was retrieved in this manner, representing an unknown but likely high proportion of the overall Spotify catalogue. In contrast to Spotify's strong metadata and uncertain comprehensiveness, the inverse was true of Apple's iTunes service. Obtaining data on its entire catalogue was unproblematic and was able to yield a broader database of 71.3 million songs and 13.5 million artists, but the data contained less rich information on each item.

Neither Spotify or iTunes, however, was able to provide the kind of detailed acoustic features of individual works demanded by my research. To resolve this barrier, it became necessary to develop the programming skills to extract audio features from input audio files and I turned to using Python libraries available in the Essentia audio analysis toolkit (Bogdanov et al., 2013) maintained by the Music Technology Group

at Universitat Pompeu Fabra. The scale of data analysed extended to over 64 million audio files, comprising over 125 terabytes of data.

Beyond alluding to the large datasets and computational processing demanded by returning to the work in a digital fashion, this cursory tour highlights many of the challenges and issues faced in pursuing such a mode of analysis. Resolving issues of field boundaries, together with the breadth and depth of data, are far from inconsequential and became important in shaping both the questions which can be asked and the authority with which they can be answered.

1.4.4 The socially conspicuous consumption of music

The phenomenal rise of digital music streaming services has intersected with the rise of social media platforms, which not only points to shifts in how audiences engage with music (e.g. Baym, 2007; Krause, North, & Heritage, 2018), but also provides new avenues of enquiry for researchers seeking to understand specific cultural fields (e.g. Brewer & Rickels, 2014). Offering both public and closed spaces for socially performative participation in musical fandom through groups and hashtags, traditional platforms such as Facebook and Twitter provide macro-level platform affordances of friend/follower relations, co-membership and 'likes' which are conducive to network analysis techniques. Music-specific platforms, such as SoundCloud, supplement this by interweaving the actual musical material of artists into the fabric of its user interface.

In contrast to digital music services, social media platforms promise data which is able to illuminate specifically *social* aspects of people's engagement with musical culture. As with my experience with digital music services, however, the research questions which this surfeit of social media traces suggested at the outset of my research were quickly forced to be reconsidered in response to the evolving socio-technical landscape. In particular, the scandal surrounding Cambridge Analytica's exploitation of Facebook to harvest personal profile data resulted in 'drastic reductions' (Venturini & Rogers, 2019) in the data which researchers – including those acting with the informed consent of participants – were able to retrieve through Facebook's API. In contrast to the outcry over the implications for valid research which was raised by some academics (e.g. Bastos & Walker, 2018), Venturini and

Rogers instead took the opportunity to critically appraise the limitations inherent in digital fieldwork in sociology and journalism studies. Their concern at a tendency of researchers to be blindly 'living on the breadcrumbs of the Facebook, Twitter and Google APIs' draws attention to the need to critically engage with these new sources of big data.

In light of both the technical restrictions and methodological concerns, the research questions and approaches pursued in this thesis have leaned much less substantially on social media data than was first anticipated. SoundCloud's public API service, for example, has suffered considerable reductions in functionality (Weinberger, 2015) and in 2018 stopped permitting new accounts to access the data offered through its API. While I was still able to extract and incorporate extracts of the platform's social relationship data into my research, it nevertheless restricted the types of analysis which could be explored. Twitter, conversely, continues to offer a robust and well-documented API which reflects its status as the platform of preference for much academic research (Rogers, 2012, p. xxi). This is despite acknowledged limitations on the representativeness of Twitter's population of users (Gaffney & Puschmann, 2013), and the gradual commercialisation of its API, whereby parts of its service are only exposed to paying customers.

Beyond issues of *access* to the abundance of data being generated as audiences engage with music on social media, the quantum of data it represents also introduces analytical challenges. Starting with the Twitter accounts of 130 composers represented by the Australian Music Centre as my first-order network, by capturing data on the friend/follower relationships of just those composers, together with the friend/followers of their friends/followers, this quickly expanded to a network encompassing nearly 60 million user accounts. At nearly 18% of the total number of active monthly Twitter users, the computational challenge of applying meaningful analysis to this data becomes an issue in itself and similarly required flexibility in formulating the final research questions and analytical approaches adopted in my research.

1.4.5 Mashups

A final observation on the context of big data which has contributed to shaping my research concerns the idea of the mashup. Originally referring to musical works which blend previously released songs, the term has more recently been applied to web applications which combine multiple pre-existing data sources into a new service. While my research is substantially concerned with generating its own data for analysis, it also seeks to enrich this data by linking to a range of third-party sources which includes and goes beyond those APIs already mentioned. The amalgamation of sources – such as my own survey data, the AMC's catalogue, Spotify, MusicBrainz, Twitter, the Musicalics composer database and ABC Classic FM radio logs – ultimately coalesced into a massive relational datastore from which I was able to approach investigations into the object of my research.

Increasingly common in research, this approach of combining heterogeneous sources is particularly appropriate to the investigation of cultural fields which are documented from different perspectives by different institutional participants. In doing so, it is of interest to reflect on two key challenges which emerge in this approach: the quality and reliability of third-party data sources, and the technical problem of accurately resolving issues of object identity across different systems. The former issue unavoidably arises in any process of data collection and has already been touched on in the case of questionable musical metadata in services such as The Echo Nest (Eriksson, 2016). For third-party sources, it demanded scrutinising not simply services in their entirety, but also the detailed variation in the quality of different data points. MusicBrainz might have comprehensive coverage of albums, but the year of birth it documents for artists was too often populated with the year the database record was created. Spotify's genre categories are more specific than Apple's, but they are less consistently applied. It was crucial, therefore, to take a critical and informed approach to the way in which particular data sources were not only selected and ingested, but also how individual data points featuring in multiple sources were prioritised for use in analysis.

The second issue, of object identity, is also one which ultimately impacts the quality of the inputs to analysis. It concerns the methods used to form a link between the Richard Meale record which exists in the AMC database, the Richard Meale in

Spotify's API, the Richard Meale in the ABC Classic FM radio logs and so on. Resolving this issue necessitated the development of scripts which not only sought to identify the closest matching record(s) in different systems, but which were also able to indicate a confidence score for the reliability of the suggested match. With the number of records often reaching into the millions, it was necessary to rely on algorithmic approaches and to determine confidence scores which struck an appropriate balance between accuracy and comprehensiveness of matched data.

1.4.6 Quantitative data analysis

In addition to the breadth and depth of data available to contemporary researchers, it is also useful to reflect on the shifts which have occurred in the realm of statistical analysis since the time of Bourdieu's seminal study. In the memoriam given by Jean-Paul Benzécri to Pierre Bourdieu, his close friend and statistical collaborator since the 1950s noted that the last letter Bourdieu wrote to him included a reflection on the question of 'What is data analysis?' (Benzécri, 2006 cited in Blasius & Schmitz, 2014, p. 206). Rather than Bourdieu's interest in analytical methods being reducible to his much heralded use of correspondence analysis, his concern for critically interrogating new techniques spanned the course of his academic career. Just as his research distinguishes between the *dispositions* of socially differentiated individuals and the specific *objects* of taste which those dispositions give rise to, it is useful to contrast Bourdieu's disposition as a researcher with the specific techniques for which he is famed. While considerable research has sought to reproduce and refine the application of MCA to cultural sociology (e.g. Leguina, 2015; Coulangeon, 2017; Bennett, Carter, et al., 2020), my own approach has instead been informed by seeking to embrace modes of analysis which are suggested by the challenge of making sense of the depth and breadth of data on the field of Australian art music which was amassed in the course of my research.

Even in journals oriented towards quantitative empirical analysis, such as *Poetics*, cultural sociology typically follows the broader trend within mainstream sociology of shying away from the cutting edge of quantitative techniques. This is reflected in studies of tertiary tuition, with Deckard's (2017) survey of US undergraduate sociology programs showing a strong preference for courses which teach traditional

statistical software such as SPSS (43%) and STATA (18%), followed by Excel (13%). While these packages implement methods such as ANOVA, regression and time series techniques, they stand in contrast to the modern tendency towards statistical analysis which draws on R (which featured in 7% of statistical courses in Deckard's survey) and statistical libraries which can be incorporated into scripts written in Python and other languages. Comparing Deckard's study with an analysis of citations which involve statistical analysis across all disciplines on Google Scholar (Muenchen, 2019) suggests that sociology trails rather than leads. While Muenchen does identify the continued dominance of SPSS based on its inertia of over 20 years, its usage is declining at a dramatic rate, with R occupying second place and the strongest growth coming from packages focussed on deep learning, such as Keras and TensorFlow. This suggests a divide in the community of sociologists as statistical technique becomes a point of competition. It contrasts a production of knowledge based on tried and tested techniques (where the notion of *discipline* extends to rules of behaviour), against more experimental (and potentially error prone) methods of investigation.

This brief review of trends in statistical software is not meant to suggest that the adoption of R and Python in my research was simply an attempt to keep pace with the latest in statistical fashion. I began my research as a novice in statistical techniques and sought to incorporate methods and tools which were appropriate to the exploratory investigation of my data. In addition to the benefits of reproducible research offered by packages which take the form of programming languages, they are also readily extensible. As of December 2019, R boasts 15,300 actively maintained community packages covering everything from data visualisation to machine learning and natural language processing. A domain such as network modelling highlights the particular advantages offered by R over traditional software. SPSS itself lacks any support for network analysis, whereas specialist network analysis software such as PNet and Pajek are not only awkward to use, but offer only very limited functionality and are without any programmatic capacity to investigate and compare network models. R, by contrast offers multiple packages to choose from for both descriptive network analysis and inferential modelling. The `ergm` package (Handcock et al., 2019) for fitting exponential random graph models, for example, is maintained by leading researchers in the field and offers not just the most comprehensive set of

modelling options available, but also supports extensive goodness-of-fit diagnostics for evaluating model performance.

The evolving landscape of statistical analysis forms a significant part of the landscape in which my research takes place. While my own research has not extended into the domains of deep learning and neural networks, it has nevertheless sought to respond to and exploit the variety of statistical techniques being developed by a range of research communities. The approaches utilised in my thesis borrow techniques developed to serve the needs of fields as disparate as agricultural science (da Silva, 2017) and community ecology (Oksanen et al., 2019). In this regard, it is in keeping with the tradition of Bourdieu's analytical disposition, which itself led to collaborations which crossed disciplinary boundaries. Ultimately, the application of novel techniques to the investigation of cultural fields makes possible new ways of conceptualising 'distance', which in turn adds to our understanding of similarity and familiarity. The resulting panoply of analytical techniques which the reader is asked to traverse has not been pursued as a form of eclecticism. In exploring new ways of investigating audience engagement with a cultural field, this thesis does so in a manner which has always been guided by the demands and opportunities reflected by the intersection between research questions and the data amassed to inform each investigation.

1.4.7 The contemporary independent academic researcher

As an academic researcher working in the 1960s and 1970s, the data amassed in Bourdieu's own survey instruments represented an unparalleled collection of data on the minutiae of cultural preferences. Synthesising this data with small targeted surveys by market research firms and national surveys of the INSEE, Bourdieu was in a unique and commanding position from which to comment with authority on the state of cultural habits in France. Contrasting this with the digital era, Latour (2007) is both cautionary and optimistic when considering the consequences of the unprecedented traces of data which are generated by the digital consumption of culture. Beyond implications for issues such as how subjectivities are formed in digitally mediated environments and the blurring of facts and opinions, he also saw the opportunity this raised for the social sciences. For Latour, in this wealth of data,

the scientific ambition of Gabriel Tarde's sociology in which 'the social is everywhere and everything' (Tarde, 1999 cited in Latour, 2005, p. 14) now had its empirical means; the social scientist finally had access to the same magnitude of data as their colleagues in the natural sciences.

The reality facing a solitary researcher working in academia today, however, is far from any such data utopia. Digital traces are increasingly owned and exploited by commercial entities, resulting in the increasingly limited capacity for independent researchers to access big data for analysis. Latour's optimism possibly reflects the specificity of, and opportunities afforded by, his own academic environment, which necessitated and exploited strong links to industry and pursued research driven by market pressures (Schinkel, 2007). For researchers working within or in collaboration with the companies amassing big data, there may well be a new abundance of opportunities; for those without such privileged access, however, their capacity to contribute to the production of knowledge risks marginalisation.

The implication of this trend for my own research is to carefully consider which avenues of enquiry permit substantive investigations and are prudent to pursue. Critical reflection on the limitations and gaps introduced by big data demands acknowledging that particular research questions, particularly on the minutiae of music consumption behaviours, are ill-suited to independent research. Not only do such reflections focus attention on areas which are amenable to analysis, but it also elevates the importance of qualitative modes of enquiry to consider questions which do not lend themselves to the analysis of big data. This echoes the approach of Crossley (2010), who, in the particular context of social network analysis, argues for the need to integrate the complementary strengths of both qualitative and quantitative approaches to address their individual weaknesses. Rather than a process of 'fleshing-out' survey data with depictions of interviewed participants as in *Distinction*, my research sought to incorporate qualitative methods which could both fill gaps left by quantitative approaches while also opening up new complementary questions on the nature of the field of contemporary Australian art music.

1.5 Thesis structure

It is against the previously discussed backdrops – of my engagement with the field, of academic research and of the challenges of exploratory research in a digital environment – that my thesis coheres into a series of investigations into the field of contemporary Australian art music and the ways in which audiences engage with that field. There is a sequential logic to the issues explored by each of the empirical chapters: from understanding how the field is constituted, to how it is mediated to audiences and to how audiences engage with and respond to particular music. Each chapter also separately engages with and responds to one of the particular research questions outlined in Section 1.2 above.

Within this sequence, Chapter 2 begins by establishing the common thread of similarity and distance which underpins each chapter. By considering how (dis)similarity among producers can be modelled in ways which capture the specificity of Australian art music, it informs subsequent investigations of how audiences navigate the field in terms of similarity and its neighbouring concept of familiarity. As discussed in Section 1.3 above, this latter concept has a strong lineage in both sociological and psychological investigations of taste, and considering how and why audiences respond to music which is unfamiliar to them is a recurring theme explored in the thesis. Chapter 3 then considers how the space of Australian art music is mediated to audiences through the platforms of radio, live concerts and digital playlists. The curatorial processes embedded in each presents a different version of the field to audiences, and the concept of distance provides a mechanism for investigating how each platform differently mediates the art form. Chapter 4 shifts the focus from the space of producers to audiences, by examining the shifting frames of appreciation and evaluation, as discursive strategies, which emerge in how and why individuals engage with Australian art music. It considers the tensions which emerge when the object of taste is largely unfamiliar, and the strategies which are employed by listeners to form an attachment to the music. Chapter 5 concludes the empirical analysis by examining the relationship between familiarity and preferences in the context of music discovery. The concept of distance, as expressed in terms of both the similarity of producers and familiarity with musical works, is examined

alongside aesthetic dispositions and the materiality of works in understanding people's affective evaluations.

1.5.1 Chapter 2: The space of producers in Australian art music

The empirical investigations begin by considering how the contours of the field of contemporary Australian art music can be variously modelled, mapped and understood. The significance of this analysis stems directly from the increasing digital mediation of culture, and the need to be vigilant about the ways in which the algorithms which underpin these services assemble the cultural space which they are representing. Bourdieu's specific theorisation of *field* is useful in this respect, as he draws attention to the specific logics which operate in fields while also observing that the autonomy of a field is a function of how independently it can adhere to its own distinct logic and suspend or disrupt dominant principles of hierarchisation (Bourdieu, 1983). If algorithms are unable to reflect the specific logics of Australian art music – and the particular distances between creators which emerge from those organising principles which the field regards as salient – then the capacity for audiences to engage with the field on its own terms is compromised.

The chapter's concern with mapping the field focusses in particular on the concepts of similarity and distance between different artists and their creative output as central to our capacity to know and constitute artistic fields of practice. It contrasts four approaches to how similarity and distance can be represented in Australian art music: the perspective of composers, the material musical output of the field, the artistic networks in which composers are curatorially imbricated, and the social networks which bind composers together. While the former approach explicitly reflects a return to the work, all three privilege understandings of the field based on the outputs of producers rather than the usage patterns of consumers. While a consumer-oriented perspective would provide an interesting contrast, as a field of restricted production, which privileges the perspective of producers, such a composer-oriented approach can be justified.

The analytical approaches adopted in this chapter firstly draw on a survey of composers and how they perceive of similarity among their peers in the field. This is then used as an input to train the development of a model of acoustic features using

multivariate techniques. After extracting detailed mathematical representations of individual musical works – comprising 327 acoustic feature descriptors for each recording – an essential challenge was to identify which minimal subset of features could usefully model the space of contemporary Australian art music. A range of multivariate and machine learning techniques were applied to achieve this task, the output of which was an optimised set of 13 descriptors. To visualise how the model represents the field, visualisation techniques such as cluster analysis and multi-dimensional scaling (MDS) were used to ascertain which differential properties of the field were being discerned.

In contrast to analysing the qualities of the music itself, the chapter also considers how various network relationships might be used to construct and model the field. 'Curatorial networks', for instance can be considered as the ways in which artistic curators juxtapose different composers in the course of assembling programs for concerts and track listings for commercial recordings. Doing so provides a complimentary understanding of which composers are similar to or distant from each other within the field. The analytical techniques of network analysis are pertinent in this respect, as they are able to both visualise and model distances between actors represented in the networks. The final approach to mapping the field draws on the same network analysis techniques to consider how audiences engaging with Australian art music composers on social media platforms serve to collectively produce a constellation of cultural producers.

The selection of variables used in this modelling and analysis is exploratory, but nevertheless seeks to understand the potential varying levels of significance contributed by factors which emerge from a variety of theoretical contexts. These include the role played by traditional demographics (e.g. gender, location, age) in shaping networks, while also examining more explicitly Bourdieusian concepts of capital. The potential for the accrual of symbolic and economic capital, operationalised as artistic prestige and commercial earnings, allows for an analysis of how these concepts may be differentially significant in the formation of various networks. Finally, the network modelling is also able to draw upon the acoustic

modelling to consider the degree to which different *musical* clusters adhere in their curation and social networks.

In responding to RQ1, the chapter's analysis points to the differing organising principles which can be observed in acoustic, curatorial and social media perspectives on Australian art music composers. Whereas the acoustic model foregrounds traditionally understood organising principles of the field – jazz vs modernism; conservatism vs experimentalism; spirituality vs serialism – subsequent approaches to modelling largely eschew such dimensions. Whereas curatorial processes moderate the distances between actors and emphasise highly prominent composers, stylistic considerations are largely absent in how social media audiences assemble the space of art music composers which are instead far more heterogeneous in nature.

1.5.2 Chapter 3: Mediating Australian art music

The thesis then turns to the issue of how the domain of Australian art music is mediated to audiences. The concept of mediation in music has been theorised as the multiplicity of social, technical and institutional actors which contribute to the shifting ontology by which music is known, understood and appreciated (Born, 2005). Within that broad array of factors, Chapter 3 focusses specifically on the different modes through which Australian art music is presented to audiences through curatorial processes. By contrasting how music is programmed among three dominant presentation modes – concerts, radio, and digital playlists – the analysis identifies the different ways in which the cultural space of Australian art music is presented to audiences. In particular, the chapter draws on the previous modelling of similarity and distance to focus on the concept of unfamiliar music. Not only will Australian art music constitute a niche and unfamiliar genre for most audiences, but within the genre there is music which occupies a middle ground alongside more stylistic extremes.

To conduct its investigation, the chapter amasses three distinct datasets reflecting each of the modes of presentation analysed: over 900,000 discrete radio broadcasts from ABC Classic FM, 4,500 concert programs of music featuring Australian art music, and 43,000 entries from 37 different Spotify playlists. It then formalises three different approaches to measuring familiarity across this data, based on frequency,

popularity and uniqueness. While familiarity is ultimately a measurement at the level of an individual's engagement with an individual work, these three measures provide approximations for investigating how each platform mediates unfamiliar music. To analyse this data, the chapter draws on traditional descriptive statistics to examine how variances across different dimensions – such as historical era, composer gender and nationality – are distributed across different modes of presentation. It further draws on simulation techniques to assess the homogeneity of programming, and traditional modelling techniques to understand relationships between popularity, broadcast frequency and uniqueness. In particular, the modelling approach incorporates novel proxies for measuring symbolic and economic capital to examine how these dimensions, which Bourdieu considers central to the structuring of broad delineations in culture, apply to the more restricted domain of art music.

The findings of this chapter respond to RQ2 by providing a comparative analysis of how each of the three platforms it investigates mediates the space of contemporary art music to audiences and provides different opportunities for audiences to engage with the unfamiliar. Whereas the maps produced in Chapter 2 include those arising from particular curatorial practices, the analysis presented here gives a clearer indication of how different modes of curation produce different representations of the field. In particular, the analytical frame of familiarity permits an evaluation of how different platforms entail different approaches to the heterogeneity and diversity of music presented to audiences. As the previously pervasive influence of radio increasingly gives way to digital streaming services, for instance, audiences are exposed to a narrower musical landscape and a relative paucity of Australian musical voices.

1.5.3 Chapter 4: Appreciating Australian art music

Whereas the previous two chapters provide broad level analyses of the field of Australian art music, focussing in particular on producers, Chapter 4 shifts attention to how audiences interact with this music. In particular, its starting point emerges from the disjuncture between Bourdieu's (1984) assertion that pleasure is a precondition for successful acts of cultural investment, and the art music concert attendees in Menger's (2017) study who were largely confounded by the music they

encountered. The theme of familiarity is central again, as the chapter considers how audiences negotiate their professed interest in the field of Australian art music in response to musical experiences which are often foreign, difficult and perplexing. By examining why and how musical taste is exercised, it identifies the negotiations and shifting frames of appreciations which audiences engage in to form an attachment to the distant objects of their taste.

The data for this analysis comes from a series of interviews conducted with art music concert attendees in Sydney in 2017. Prior to each interview, I co-attended a concert selected by each participant; this approach provided the opportunity to generate data pertaining to responses to particular works, in addition to participants' broader interactions with contemporary Australian art music. In addressing RQ3, the findings showed that for all participants, the decision to practise their taste in this field of music was remarkable for the absence or limited role played by the anticipation of common forms of pleasure. In examining the discursive strategies used to articulate their taste, the analysis identifies three discrete frames for evaluating the music they encountered: intellectual, affective and presentation. Respondents were able to move between these in ways which both strengthened and reinforced their own conceptualisation of the field. Furthermore, the analysis points to the ways in which the very ambiguities and tensions which are evident in the field contribute to the diversity of approaches which listeners draw upon as they engage with contemporary art music.

1.5.4 Chapter 5: Discovering Australian art music

The thesis concludes by examining processes of music discovery in contemporary Australian art music. It provides a contrast to the intimate processes of attachment found in Chapter 4's concern with concert attendees by instead focussing on the domain of digital consumption. The central theoretical concern examined in Chapter 5 is the relationship between familiarity and preference, and how this translates to a field which places particular emphasis on novel creative practices. By examining affective responses to samples of musical works, the analysis considers the interplay of familiarity – at the levels of both genre and individual musical work – with preferred modes of music appreciation and the stylistic attributes of the music itself.

The research involved an online survey of 350 respondents across three cohorts of varying prior familiarity with Australian art music. In addition to demographic information and broad musical preferences, the survey collected participant liking and familiarity data on a range of contemporary Australian art music samples selected by personalised algorithms. The chapter firstly uses exploratory factor analysis (EFA) as a statistical method for identifying the different 'modes of appreciation' which listeners adopt when listening to music. This approach builds on Bourdieu's notion that investigations of taste should seek to identify the structuring principles which give rise to particular cultural objects as opposed to the specific objects themselves. Complementing the fluid discursive frames used to practise taste in Chapter 4, the analysis identifies four distinct 'modes' of appreciation as broad aesthetic dispositions: intellectual, emotional, functional and hierarchical. The findings do not, however, provide significant support for locating these modes in different processes of socialisation.

Having identified these modes of appreciation, the analysis then uses mixed effects modelling to examine how different 'independent' variables interact to predict positive evaluations of music. The notion of independence here does not require any assumption that the assembled variables are orthogonal to each other. Rather, the approaches taken to modelling permit analysing the mutual influences which may be present. In addition to the aesthetic disposition factors identified above and standard sociological measures of cultural and social capital, this modelling also incorporates the previously developed acoustic model of similarity and distance between composers in the field of Australian art music as candidate independent variables. This is done to assess the capacity for similarity to act as a surrogate for familiarity, but also to incorporate a 'return to the work'. The multi-dimensional scaling conducted in Chapter 2 becomes a way of positioning the stylistic properties of each work being recommended and the capacity for different styles to more readily engage users with music that is unfamiliar to them.

In responding to RQ4, this chapter's findings emphasise the need to go beyond familiarity in theorising affective responses to music. Instead, it points to the need to consider the ways in which different modes of appreciation intersect with specific

styles of musical content to produce affective responses to unfamiliar music in digital environments. The analysis shows that different levels of familiarity with a genre, as opposed to specific works, impact the capacity for distances in acoustic similarity to correspond with individual perceptions of familiarity. A model of similarity based on the perspective of producers is only able to provide a proxy for familiarity for listeners who are themselves less familiar with Australian art music practice. For listeners with a stronger overlap with the field of producers, the fine-grained nuances of perceived familiarity are unable to be approximated by the same acoustic models.

1.5.5 Chapter 6: Conclusion

The thesis concludes by evaluating the collective contributions made by the thesis in its investigations of how distance can be employed to extent a sociological understanding of cultural practices. In particular, it argues that a multidimensional approach to distance – incorporating multiple perspectives and scales of analysis – permits new ways of understanding fields of cultural practice and the broader social spaces in which they are located. The multiple sets of organising principles which are uncovered in this mode of analysis bring attention to the intersecting classificatory schemes which are brought to bear to guide our action in relation to culture. The conclusion also considers limitations of the thesis' program of research, together with identifying opportunities to extend the research in new empirical, conceptual, and technical directions.

2 The space of producers in Australian art music: Composer, acoustic, curator and audience perspectives

Notions of similarity and distance between artists can be argued as central to our capacity to know, understand and constitute artistic fields of practice. The concept of distance is crucial, for example, to the operation of most recommendation algorithms. Accordingly, it helps determine how consumers engage with a field. This chapter contrasts four approaches to how distance and similarity can be represented in the specific domain of Australian art music. The perspective of composers themselves, the 'material' acoustic output of the field, the artistic networks in which composers are curatorially assembled, and networks of social media usage, are all used to derive mappings, models and descriptions of the field. The resulting importance given to stylistic concerns in the composer and acoustic models, is then contrasted with the organising principles through which the field is understood from curatorial and social media perspectives. Whereas curatorial networks emphasise hierarchies and minimise distance, the mappings of producers which result from social media are far more heterogeneous in how composers are juxtaposed. The resulting models of distance are used to inform the analysis of similarity, and the related concept of familiarity, in subsequent chapters.

2.1 Introduction

When considering the dimensions of a cultural practice, be it in the development of recommendation algorithms or in the sociological analysis of 'fields', the notions of *distance* and *similarity* between actors are central concerns. The very act of making a delineation or association, whether it takes the form of juxtaposing composers in a concert program or algorithmically deriving a dissimilarity matrix of composers, can, in and of itself, be considered part of the work of constituting a cultural practice. By variously maintaining and reconfiguring the proximities between cultural producers,

geographic metaphors such as ‘field’, ‘map’ and ‘landscape’ become possible, and the space of cultural practice becomes knowable in terms of its collective similarities and distances. Furthermore, these distances are multiple. Different sets of differences can be produced – each representing a different perspective of the field and each with its own salient organising principles for how it is cohered and understood.

The present chapter engages with this multiplicity by investigating various approaches to *mapping* the field of Australian art music practice. The aims of doing so are twofold: to contrast how different perspectives construct Australian art music as a field of cultural production and to gain insights into how we can better understand the field itself. In doing so, it responds to the issues raised by the thesis’ first research question which is concerned with the *multiple* ways in which a field can be mapped and modelled. At the same time as acknowledging this multiplicity, the research question also showed a concern for identifying models which are specific to Australian art music as a *distinct* space. Rather than applying generic models, the investigations in this chapter respond to this by considering processes of modelling Australian art music on its own terms.

In pursuing the first aim of establishing and contrasting ‘objective’ representations of different perspectives within the field, I am not proposing access to some ‘truth’, but am instead interested in the reproducibility of models of the field given a set of inputs I select. The chapter’s emphasis on contrasting different ways of mapping the field corresponds with Bourdieu’s exhortation to work with multiple perspectives and points of view and, in doing so, to foreground the antagonisms and incompatibilities which emerge (Bourdieu, 1999, p. 3). Many such models can be constructed, each fitting its own approximations to data which is selected to reflect relevant features – and particular perspectives – of how the field is constituted. By articulating these understandings of the field as formal models, they further lend themselves to being programmatically employed in subsequent analysis. Chapters 3 and 5 of this thesis, in particular, draw upon the work in this chapter to consider broader questions pertaining to the related concepts of diversity and familiarity in the curation and consumption of Australian art music.

A key concern for this chapter is to consider how models can be produced which are specifically relevant to and meaningful for Australian art music practice. This brings my research into dialogue with two themes relating to power found in Bourdieu's work: the relationships between knowledge and social action, and between logics of practice and the autonomy of fields. In emphasising his concern with 'human activity' as opposed to 'human theorising', Snook (1990) places Bourdieu in a philosophical tradition of Kant and Nietzsche in which knowledge is not an impartial search for truth, but instead involves ways of viewing the world which satisfy particular needs. In this theorisation, different ways of representing the field of contemporary Australian art music can be posited not simply as arbitrary, but as tied to enabling particular kinds of action for people and groups. The capacity for particular schemas of representation to establish themselves with broader legitimacy, in turn, becomes implicated in issues of power. To borrow from Lukács (1923), rather than presuming the 'fact' of a field's existence, it is the varying processes which give rise to the phenomenon of a field which become the pertinent object of critique.

Beyond contestations which emerge *within* fields, the very capacity of a field to be recognised as such is linked to the existence of ways of knowing and understanding its practices which are specific to, and on the terms of, that field. Bourdieu's theorisation of *field* is useful in this respect, in that he not only draws attention to the specific logics which can be said to operate in fields, but also observes that the autonomy of a field is a function of how independently it can adhere to its own distinct logic and suspend or disrupt dominant principles of hierarchisation (Bourdieu, 1983). Previously, I have drawn on Becker's (1982) notion of 'conventions' in art worlds, to emphasise how these logics can be embedded and systematised in technologies of music documentation, and in doing so are crucial to our capacity to construct and identify art music as a discrete area of practice (Chambers, 2007). In music, these conventions and logics extend to the ways in which algorithms and user interfaces are constructed with the dominant commercial forms of music in mind. This goes beyond the level of design considerations, with algorithms often implicitly embedding particular understandings of the field in the way they function. The generic set of acoustic features which are used to inform the development of content-based recommendation systems will not necessarily be able

to reflect the dimensions which are salient to distinguishing practices within Australian art music. The specificity of these dimensions can be observed in the frequently hostile 'style wars' which emerged among Australian art music composers in the 1990s (Heino, 2019). These arguments positioned particular schools of avant-garde composition against more conventional approaches, and produced distances between actors which were significant in understanding and knowing the field. By isolating a set of acoustic features which are most capable of representing the latent organising principles of the field as perceived by its producers, my research is complicit in processes which seek to make the field distinctly knowable.

The second aim of this chapter regards the processes of mapping, modelling and more generally representing fields as useful ends in themselves. By systematically taking aspects of the field, be they the properties of acoustic signals in the field's material output, or the curatorial and social relationships which tie actors together, the subsequent derivation of representations of the field can bring into relief aspects which are otherwise difficult to apprehend. In contrasting how the space of Australian art music producers is variously understood by the producers themselves, recordings, curators and audiences, I argue that important gaps and contradictions occur. In contrast to the well-structured stylistic dimensions which define the field from the perspective of composers, curatorial processes reconfigure this space in presenting it to audiences in a manner which both underplays distance and emphasises the prominence of selected actors. Conversely, the proximities among composers which arise from audience engagement with the field largely eschew stylistic dimensions and instead demonstrate more heterogeneous and ideological aspects of how the field is understood.

2.1.1 Chapter overview

The empirical analysis presented in this chapter proceeds by separately investigating the projections of the field which result from each of the composer, acoustic, curatorial and audience perspectives. A review of the particular methodologies used to collate and analyse the data for each perspective is followed by a presentation of the results and their subsequent analysis. Drawing on a survey of Australian composers which asked them to rank the similarity of other composers to their own

work, the first section considers how the field's producers consider similarity and distance. While showing a bias towards selecting highly regarded and successful composers as similar to themselves, this provides an important baseline which can be incorporated into the subsequent analysis of recordings. The second section utilises acoustic feature analysis to develop a multivariate model capable of representing the space of Australian art music. By training the model's development on the composer survey data and how producers in the field conceive of distance, this ensures a model which is specifically relevant to the dimensions of art music practice. Clustering and multi-dimensional scaling (MDS) techniques are then used to identify the latent organising principles of the field which arise from this acoustically derived model.

The analysis then turns to the biographical and curatorial networks which mediate Australian art music to audiences. Performers, venues, CD recordings and concert programs all involve assembling composers together in ways which can be analysed in terms of distance and similarity using network analysis techniques. These techniques also permit analysing the varying prominence of actors, together with modelling endogenous and exogenous variables which give rise to the observed network structures. In contrast to the previous representations of the field derived from the perspective of composers and acoustic analysis, curation processes are shown to involve a reconfiguration which moderates stylistic influence and places an emphasis on highly regarded composers in presenting the field to audiences.

The way in which audiences perceive of the field of producers forms the fourth and final perspective considered, and is examined by way of social media relationships on Twitter and SoundCloud. As much flatter networks which result from the low cost of establishing friend and follower relationships between actors, both these platforms produce very different representations of actor prominence which, skewed in part by their younger demographics, favour early and mid-career composers and which disregard the importance given to artistic prestige evident in composer and curatorial representations of the field. The section concludes by developing novel approaches to deriving maps of the field which address limitations in the small diameter yet low density nature of social network data. Significantly, these maps downplay the importance of stylistic differences in representations of the field and instead point to

the heterogeneous associations which are made by social media audiences. The capacity for clusters of composers to coalesce around ideological, rather than aesthetic concerns, provides a further differentiation in how this perspective is able to construct the space of Australian art music composers.

The remainder of the current section explores how the chapter's various quantitative approaches relate to broader questions of the interpretation of cultural fields, raised in the Bourdieusian tradition of cultural sociology.

2.1.2 Network analysis and fields of cultural production

The different perspectives of the space of Australian art music composers which are modelled in this chapter – the composers themselves, the material outputs of the field, artistic curators and social media audiences – are each examined by way of separate data collection and analysis techniques. The variety of approaches has sought to reflect the different affordances presented by the data and ranges from a survey of composers, to acoustic feature analysis of recordings and network analysis of curatorial and social network data. While the first two of these methods have variously been applied to develop understandings of artistic fields of production (even if from substantially divergent disciplinary perspectives and aims), network analysis techniques have received less attention. This is due in part, perhaps, to the challenges of collating sufficiently comprehensive datasets capable of representing the rich relationships inherent in artistic practice. Instead, the majority of such studies have focussed on communities of consumption, typically around problems of collaborative recommendation (e.g. Konstas, Stathopoulos, & Jose, 2009) and investigating the function of homophily[5] in musical taste (e.g. Baym & Ledbetter, 2009).

A smaller body of network analysis research does focus explicitly on networks of cultural production (rather than consumption), such as the study by de Nooy (2002), who modelled network dynamics in the Dutch literary field to explore the relational character of fields and the way in which prestige operates in the affiliations between

[5] Homophily refers to a pattern in social network analysis in which the propensity for two actors to form a relationship is increased if the actors share a common characteristic. McPherson, Smith-Lovin, and Cook (2001) neatly paraphrase the pattern as 'birds of a feather flock together'.

authors and literary magazines. The longitudinal evolution of networks is a similar focus of Kirschbaum (2017), who applied traditional network analysis and clustering techniques to network data derived from joint recording sessions of jazz musicians. Drawing on networks arising from the curatorial practices which co-produce and mediate the field, Kirschbaum focussed on both the networked trajectories of musicians across different historical eras, and contrasting normative and competitive bases for structuring the jazz music field. The study by McAndrew and Everett (2015) on the social networks among 505 British composers has parallels to the current study and provides a useful point of comparison to the present focus on contemporary Australian composers. In constructing 'social networks' of composers, McAndrew and Everett relied solely on network relationships identified in the analysis of biographies (specifically from *Oxford Music Online*) and, in focussing explicitly on social rather than broader biographical relationships of influence, also placed a relatively high threshold of personal contact between composers to establish whether or not a network relationship exists.

In addition to situating composers in networks which arise from biographical and curatorial practices in the field, we can also observe the location of composers from the perspective of what are *social* networks in a more explicit manner. The biographical form of social connectedness observed by McAndrew and Everett (2015), and replicated here in a network derived from Australian Music Centre (AMC) composer biographies (see 2.4.1.5), inevitably suffers from reflecting only a very partial representation of the social networks in which a composer is involved. In contrast to the expansive networks of collaboration seen in Becker's (1982) conception of 'art worlds', the low density statistics observed in biographical networks reflect an approach which not only presents interactions between just one type of actor – composers – but also includes only a highly selective subset of these relationships. Biographical networks tend to privilege articulating relationships with composers who are already perceived as influential in the field, with this finding observed in the self-reported similarity survey data (see Section 2.2).

While the scarcity of relationships captured in biographical analysis presents a limitation, its capacity to be relatively exhaustive by including an entire population of

actors does enable topographical analysis of a field and represents an inversion of the sort of ethnographic modes of analysis favoured by art world oriented approaches (Becker & Pessin, 2006). The proliferation of social media platforms, however, offers an alternative way of addressing the issue of depth in a manner which is conducive to quantitative network analysis of the field as a whole. While in no way approximating the richness of data found in Becker's approach, the analysis of online social networks does at least permit a consideration of how composers are located among a much wider set of actors. The analysis of social media platforms, therefore, offers an additional perspective from which to consider how the space of Australian composers can be understood. In contrast to the composer, acoustic and curatorial perspectives analysed in this chapter, social media platforms instead offer representations of the field from audience-oriented points of view. While the sociological investigation of social media platforms frequently approaches them as sites of *social behaviour* (McCay-Peet & Quan-Haase, 2017), the current chapter's interest is limited to their capacity to variously situate the relative positions of composers within social networks utilised by audiences.

2.1.3 Boundaries in the field of production

Beyond the specific analytical techniques pursued in response to the various data, the approach to data collection in the quantitative analysis of cultural fields becomes a central methodological concern. The choices made by the researcher not only determine which aspects of the field are considered salient and how they are operationalised, but also serve to establish and pre-determine the boundaries of the field under investigation. Briefly reflecting on the boundaries established in my research is therefore appropriate to contextualise the interpretation of the results which are produced.

The approach taken in this chapter has been to adopt an institutional definition of the field of producers, specifically that delimited by the documentation activities of the Australian Music Centre (AMC). The AMC is a national service organisation representing Australian composers, sound artists and improvisers whose practice lies in the broadly defined domain of art music. Founded in 1974 and funded in part by the Australia Council (the federal government's arts funding body), the AMC is part of

an international network of music information centres and undertakes a range of documentation and promotional activities on behalf of composers who have applied for and been granted representation status. Representation is granted based on either peer-review or as a result of a composer's work having achieved a level of utility in the field (e.g. through public performances or recordings). A total of 765 composers were represented as of March 2019 and these composers are featured in a detailed catalogue of their works, sheet music, recordings and events, together with a library of physical and digital materials.

In using the activities of the AMC as a proxy into investigating the field, it is acknowledged that the AMC can, in Bourdieusian terms, be taken to represent an orthodoxy, which seeks to systematise and normalise a doxic understanding of Australian art music, but which is inevitably doing so alongside competing possibilities which pursue their own framings of the field. Not only do other major institutional actors, such as the Australia Council and Australian Broadcasting Corporation (ABC), pursue their own delineations of the field, but so do the collaborations and networks which unfold from individual practitioners pursuing their artistic practice. In addition to adopting a particular institutional definition, the orientation I have chosen is acknowledged as inherently composer-centric and reproduces understandings which privilege composers by placing them at the centre of the field of production. My research responds to these methodological constraints by firstly foregrounding the diversity in how this orthodoxy might be modelled and understood. Secondly, the composer-centrality is moderated by considering broader networks of performers, venues and social media actors in the analysis of artistic networks. Finally, subsequent chapters of this thesis expand to consider broader framings of how the field of production is mediated to audiences. Chapter 3, for example, considers the field as presented by both ABC radio and Spotify, while Chapter 4 draws on interview data which allows for greater fluidity in how respondents approach articulating the boundaries of Australian art music practice.

2.1.4 'Ground truth' in a field of restricted production

In developing a map of the field of Australian art music, particularly one based on the acoustic features of its music (see Section 2.3 below), a preliminary issue arises in

assessing the extent to which any resulting map, and any fitted model on which it may be based, can be said to successfully reflect the field it is attempting to describe. Any combination from hundreds of potential acoustic features could be chosen, such as the 17 parameters in the MPEG-7[6] industry standard (International Organization for Standardization, 2002), with each representing the field based on a different set of inputs. As previously noted, however, this chapter is concerned with contrasting approaches which are specifically meaningful to the domain of Australian art music practice. In music information retrieval (MIR), this type of challenge is commonly addressed by adopting a singular notion of 'ground truth'. This can take the form of an a priori classification scheme, such as genre labels, to inform the development of classification algorithms. Similarly, in the discipline of recommender studies, its interest in the algorithms and technologies which connect users with content leads to privileging particular configurations of the consumer as a singular truth. The quality of algorithms can then be empirically tested by operationalising this truth in the form of user studies (Aggarwal, 2016).

In these approaches, however, any such 'truth' which informs the development of a model is also open to criticism for being uncritically accepted as universal and unproblematic (Sturm, 2014). In seeking a grounding against which to train the development of acoustic models of the field, I am not proposing that there is a single 'real' version of the field which all models should be seeking to approximate. Any map or model serves to privilege, legitimise and reproduce particular understandings of a field, and the approach advocated here is to foreground this issue and the implications it has for how that model is deployed. Whereas Wittgenstein provides the metaphor of completely throwing away the ladder in abandoning attempts at beliefs (Reid, 1998), the process of doing so remains a useful reminder of the constructed and partial footings on which our models are built.

The approach taken here in responding to this epistemological concern has been to establish a 'ground truth' from the perspective of the field's cultural producers. In contrast to the consumer's pre-eminence in fields of commercial mass production, in

[6] MPEG-7 is a multimedia content description standard used to support music information retrieval.

fields of restricted production the perspective of producers can be seen as having greater legitimacy in influencing understandings on how such fields are perceived to be structured. Bourdieu, for instance, considers that in an ideal field of restricted production, "producers produce for other producers" (Bourdieu, 1983, p. 320), with a situation of total autonomy being the achievement of 'specific consecration' in which the only valid criteria for legitimacy is the recognition of those whom they themselves recognise. While Australian art music cannot be said to exhibit this level of autonomy, the purview of composers – adjudicating on award juries, assessing grant applications, peer-reviewing representation at the Australian Music Centre – nevertheless holds a significant and influential position in delimiting and establishing the hierarchies and organising principles of the field.

2.2 Composer perspective analysis

The capacity to develop a comprehensive map of similarities between Australian art music producers, based on the perspective of the producers themselves, is both logistically and computationally intractable. Taking just the 765 composers represented by the AMC, an exhaustive map would require compiling a matrix of over 580,000 distances between pairs of composers. Not only does this represent a quantum challenge, but it also introduces the complexity of asymmetrical distances. A situation where the distance from composer A to composer B is not required to reciprocate the distance perceived from the opposing point of view may indeed reflect perceptions *within* the field, but introduces considerable analytical complications in mapping the space of actors. One approach to resolving these challenges is to instead draw on biographical networks, such as those found in AMC composer biographies (see 2.4.1.5 below) or the network of British composers compiled by McAndrew and Everett (2015). While these have the capacity to be exhaustive in their coverage, they are unable to represent the depth and varying intensity of relationships. When combined with the low density networks they produce, they lack the discriminatory power to map a field of cultural producers.

As touched upon in Section 2.1.4 above, the approach taken in this chapter is to instead compile a sample of composer similarity data which can then be used to inform the subsequent development of an acoustic model (detailed in Section 2.3). By

embedding the perspective of how composers conceive of the field in the acoustic model, it provides a drastically more flexible means for investigating composer-oriented constructions of the field. Instead of the analysis being limited to a small sample of composers, the ubiquity and accessibility of recordings can be used as a proxy for investigating the relative positions and distances between a much wider range of producers (including deceased composers). An acoustic model derived in this way will inevitably only be an approximation of composer understandings of the field, but the gaps which arise between the two also provide a further avenue of investigation to consider which aspects of distance cannot be explained by acoustic similarity.

2.2.1 Methodology

To obtain a sample of composer perspectives of the space of Australian art music composers, a survey was conducted in July 2018 of the composers whose music is featured in the Australian Music Centre's (AMC) collection. The two criteria for inclusion in the survey sample were, firstly, that the composer had an email address verified with the AMC, and, secondly, that they had at least eight unique works in the AMC's recorded music collection[7]. These criteria were met by 244 composers, each of whom was invited to participate via an email which included a personalised link to the online survey. The survey, which is reproduced in Appendix B, asked respondents to rank a list of five pre-selected composers in order of how similar they regarded each composer's overall musical practice to their own. Pilot testing identified the potential for a negative response among participants from only being offered forced-choice similarity questions; as a result, respondents were first given the opportunity to nominate international and Australian influences on their work through free-text response fields. The list of five pre-selected composers was customised for each potential respondent and was selected from among fellow AMC composers who had at least some similarity to the respondent based on similarity scores derived from acoustic features. The lists were compiled using a variety of candidate audio feature sets identified in preliminary investigations of acoustic features. The rationale for this

[7] This second criterion was necessary due to the algorithmic method used to select the options presented to participants in the forced choice ranking questions.

approach was to increase the likelihood that respondents would be familiar with each of the candidate composers.

A total of 86 responses were received, reflecting a survey response rate of 35.24%, representing 11.24% of all AMC represented composers. Of these responses, 63 (25.82% of responses; 8.24% of all composers) completed all five rankings and a further four respondents completed partial rankings. Having full data for over one-quarter of the potential candidate composers can be considered a strong foundation from which to build a producer-oriented reference point for the field. The eligibility criterion of having a minimum number of recorded works in the AMC collection, together with the self-selection of respondents, suggest that the sample will likely favour composers who are highly recognised in the field and who, moreover, hold a desire to portray themselves as central to the field's definition.

2.2.2 Results and analysis

The data analysed comprises each individual composer's ordinal ranking of five nominated composers, which they were asked to order from being most to least similar to their own creative practice. In considering how composers conceive of their own position in the field, it is useful to briefly observe the response bias which can be seen among the participant rankings. When considering the artistic prestige and commercial earnings scores (see Section 3.3.5 for the calculation of these scores) of each of the five composers respondents were asked to rank in terms of similarity to their own practice, there was a clear trend whereby participants were much more likely to select 'successful' composers as being most similar to themselves. This is shown in Figure 2.1, which shows participants were much more likely to select the most 'successful' composer option as being most similar to themselves. This is true in the case of publicly recognised forms of artistic prestige (e.g. prizes and commissions) and is even more pronounced with respect to the less conspicuous attribute of commercial earnings.

Figure 2.1 Artistic prestige and commercial success bias in self-reported composer similarity responses

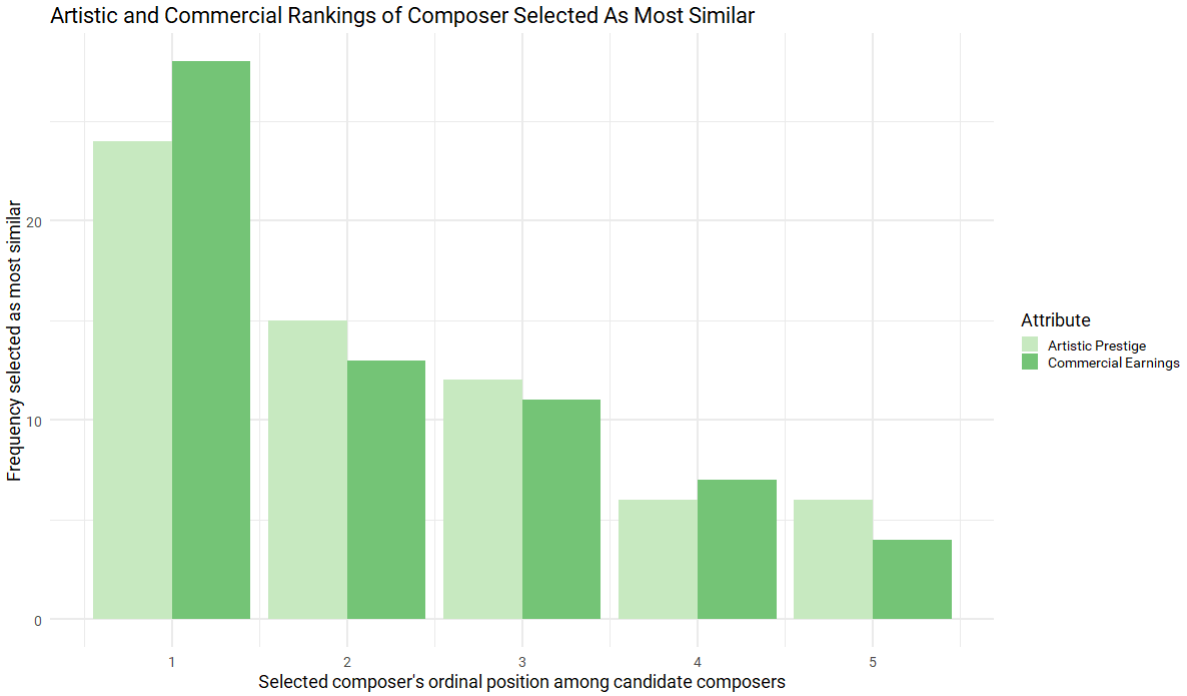

Figure 2.1 takes each of the five customised composer options presented to respondents and assigns them an ordinal rank, from 1 to 5, in terms of their artistic prestige and commercial earnings scores. The graph's frequencies reflect how often respondents selected different ordinal positions as most similar to themselves.

This may be interpreted as being partially attributable to a function of familiarity, whereby composers opted to choose the most recognisable name from their personalised list of five composers. Also potentially present, however, is an effect of an attempt to 'game the system', in that the invitation to composers asking them to complete the self-reported similarity survey was presented in the context of the AMC's efforts to develop improved recommendation systems. By aligning themselves with composers regarded as artistically and commercially successful, some respondents may have been hoping to influence the logic by which such recommendations are made.

Regardless of the underlying cause of the observed trend, its presence serves to emphasise that a producer-oriented version of the field clearly captures elements which go beyond a simple similarity with acoustic properties and instead involves adopting positions in relation to figures of perceived authority. As such, it alludes to

some of the challenges which are addressed in the subsequent acoustic analysis, which seeks to reproduce the constellation of distances which is reflected in this producer perspective of the field by drawing solely on the acoustic features of recordings of Australian art music.

2.3 Acoustic feature analysis

The composer rankings obtained in the preceding section become an input to use in refining a model of Australian art music based on the material output of the field in the form of musical recordings. While the notion of using the artistic output of a cultural field might appear self-evident, it can also be understood as somewhat provocative given the discursive positioning which frequently accompanies the presentation of works. Martin's (2006, p. 63) observation, from the viewpoint of popular music studies, that musical meanings are frequently derived from non-musical sources can equally be seen to apply to art music, where program notes at concerts and introductions given to works broadcast on the radio all serve to place the work in a context to prepare the listener to hear sounds in a prescribed relational context. Similarly, the analysis of acoustic features is, inevitably, a reductionist approach which can be argued undermines and is fundamentally incompatible with understandings of the field which emphasise the depth and richness of individual compositional voices.

Stripping music to its audio signal and asking it to 'speak for itself', however, also reflects the increasing prevalence of consumption environments, epitomised in digital music services, which largely eschew such contextual cues. Not only does the contemporary era of digital infomediaries contribute to shaping processes of valuation and evaluation (Morris, 2015), but the new processes of mediation which they accompany similarly reconfigure how meanings are produced. Furthermore, by here adopting an approach in which the development of acoustic models is informed by a 'ground truth' of composer understandings of the field, I continue to follow a logic which is derived from within the field. Indeed, the resulting juxtapositions and contrasts produced in mappings generated from such an analysis of acoustic features, particularly those which might be unexpected or disputed, are instructive to consider how discursive framings seek to foreground and disregard different musical features

and characteristics. The specific aim of the present acoustic feature analysis, therefore, is to derive a parsimonious set of features which are capable of capturing as much of the variation in the underlying dataset of Australian composers and their music as possible. In doing so, the goal is the enumeration of a suitably small set of features which, when utilised in multivariate statistical techniques to derive distances between composers, are best able to approximate the distances derived from the producer perspective discussed in 2.2 above. Whereas the producer distances are only able to recreate the space of participants included in the survey, using acoustic features to develop a model which approximates those distances supports mapping a space bounded only by the range of works available for acoustic analysis.

2.3.1 Methodology

Approaches to identifying acoustic feature sets can be distinguished between those used in MIR and music psychology. As discussed by Siedenburg et al. (2016), studies based in MIR are typically goal-oriented and involve computationally analysing a large battery of acoustic features (which the authors distinguish as 'descriptors') to solve problems such as classification, and often using machine learning. Music psychology, conversely, usually utilises a much smaller set of features which are selected to reflect the physical correlates of psychological processes and which address issues pertaining to subjective perception using techniques such as dissimilarity ratings, together with modelling informed by cognitive processes of music perception and cognition.

The approach taken in this analysis is closest to the approach found in MIR, which reflects the current study's goal-oriented concern with modelling a field of practice from a corpus of recordings, as opposed to engaging with issues of perception and cognition. A large set of audio descriptors are deployed to find a suitably small set of the most salient features through dimension reduction techniques. In doing so, however, the goal is not one of classification (as is typically the task in MIR), but rather of generating a set of *distances* between the music's composers. Part of the methodological novelty in this analysis, therefore, is the way in which the acoustic modelling seeks to represent multiple sets of *distances* in the field (as perceived by its producers in the survey discussed in 2.2), as opposed to merely solving a problem of

classification. The end result remains a set of features – akin to those developed in music psychology – which reflects their selection based on fitting composer (i.e. human) perceptions.

2.3.1.1 Dataset

The primary input for the acoustic analysis was the digitised recorded music library of the Australian Music Centre (AMC). At the time of analysis, this library comprised 11,053 recordings of unique musical works by 815[8] different composers. For each of these works, the composer was identified together with a broad-level classification of the work's instrumental and vocal forces. The Australian Music Centre's Instrumental Subject Headings (ISH) already assigned to each work in its catalogue were used for this purpose. The ISH classification is a hierarchical description of specific instrumental forces (i.e. the combination of musical instruments and vocalists necessary to perform a work) with nearly 4,000 discrete terms. As this fine-grained classification is too specific, only the highest level terms in the hierarchy were used to form a categorical descriptive variable in the analysis, resulting in the distribution of recordings listed in Table 2.1.

Table 2.1 Distribution of recordings by instrumental classification

Instrumentation	Count	Proportion
Chamber music	2,809	25.40%
Choral music	649	5.90%
Dramatic music	122	1.10%
Electronic music	498	4.50%
Instrumental music	4,301	38.90%
Miscellaneous	524	4.70%
Orchestral music	1,069	9.70%
Vocal ensemble music	130	1.20%
Vocal music	951	8.60%

[8] The number of composers in the digitised recorded music collection is greater than the number of represented composers due to the AMC occasionally extending its documentation activities to encompass non-represented Australian composers whose work is presented alongside represented composers.

2.3.1.2 Feature extraction

The extraction of audio features for each recording was performed using the Essentia software (Bogdanov et al., 2013). Essentia's `Music` and `Freesound` extractors provide a comprehensive set of 327 descriptors, representing a range of statistics (e.g. mean, standard deviation) calculated across 156 different audio features (see Appendix A). For sequential frame-based features, which analyse successive samples of a recording, the standard set of statistics (mean, variance, median, minimum, maximum) were supplemented with calculations of the mean difference and mean absolute difference in order to capture the 'differencing' effect in time-series analysis, which has been identified as a primary source of interest in music perception (Dean & Bailes, 2010, p. 154).

The initial phase of feature reduction was conducted by removing highly related features (e.g. Essentia provides both Mel-scale and Bark-scale based energy bands), together with features which literature has demonstrated to be of little value (e.g. Tzanetakis and Cook (2002) found that Mel frequency cepstral coefficients beyond the first five provide minimal useful information). A total of 144 descriptors were removed in this process, leaving 183 candidate statistics derived from 70 different acoustic features retained for initial analysis.

2.3.1.3 Normality

As a number of multivariate techniques assume at least vaguely multivariate normal data (Manly, 2016), the next stage was to remove those variables which were not normally distributed. Each descriptor was assessed for normality by dividing each of its skewness and kurtosis scores by the respective standard error for these statistics[9]. If the absolute value of the resulting skewness or kurtosis 'z-sores' was greater than 1.96 (representing a 95% confidence interval), it was taken to indicate a non-normal distribution (Kim, 2013). For any descriptors so identified, an attempt was made to

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[9] Skewness standard error was estimated by the formula $Skewness_{se} = \sqrt{\frac{6n(n-1)}{(n-2)(n+1)(n+3)}}$, where n is the number of observations in the data.

Kurtosis standard error was estimated by the formula $Kurtosis_{se} = \sqrt{\frac{4(n^2-1) \cdot {Skewness_{se}}^2}{(n-3)(n+5)}}$, where n is the number of observations in the data.

apply a transformation which would provide a normal distribution of its values. A Box Cox transformation was applied to these descriptors using a lambda value selected using R's `forecast` package (Hyndman et al., 2019); rather than estimating lambda based on maximising log-likelihood, the analysis employed `forecast's` implementation of Guerrero's (1993) subsequent work on minimising transformation. Transformed descriptors which were still unable to meet the previous criteria for normality were discarded. This resulted in 152 descriptors being discarded during this phase, leaving 31 descriptors retained as potential candidates.

2.3.1.4 Possible instrumentation-specific descriptors

As the goal is a set of acoustic features which are able to distinguish on the broader musical style of a composer, it was desired to omit any descriptors which instead serve to distinguish on the basis of a specific instrumental form. As some composers write predominantly for particular instrument genres, this serves to eliminate this as a confounding factor in mapping the acoustic space of producers. To make this assessment, for each remaining acoustic descriptor, pairwise t-tests were performed to assess if the distribution of values for the descriptor was significantly different for each combination of instrumentations. The tests were conducted without the assumption of equal variances. If the mean of a particular instrumentation was found to be significantly different ($p < 0.05$) from the mean of all other instrumentations for a particular descriptor, a boxplot showing the descriptor's distribution for each instrumentation was generated. This was used as the basis to visually inspect the extent to which the instrumentation-based deviations could be considered to reflect that the descriptor was uniquely identifying an aspect of instrumentation. This resulted in boxplots of 22 acoustic descriptors, none of which were considered to exhibit the characteristic of uniquely identifying the features of one or more instrumentations. As a result, all 31 candidate descriptors were retained at this stage of dimension reduction.

2.3.1.5 Correlated descriptors

The final set of 31 candidate descriptors were standardised, that is, converted to Z-scores having a common mean of zero and a standard deviation of 1, thereby removing variations introduced by the different scales of each variable. The next

stage in dimension reduction was to remove variables which exhibited a high degree of correlation with other candidate descriptors. The Pearson correlation coefficient between each pair of descriptors was calculated, with different thresholds used to identify descriptors which could be discarded due to their variability being adequately captured in the paired audio features. In such instances, the variable with the lowest variance (as measured by the median absolution deviation (MAD)) was chosen to be discarded. Based on different correlation thresholds, this resulted in retaining between 9 and 17 descriptors as per Table 2.2 below.

Table 2.2 Number of retained acoustic descriptors at various correlation thresholds

Correlation Threshold	Retained Descriptors
$\|r\| < 0.7$	17
$\|r\| < 0.6$	15
$\|r\| < 0.5$	9

2.3.1.6 Combination Analysis

The final stage of dimension reduction involved assessing how different combinations of the 17 descriptors retained at the 0.7 correlation threshold were able to reproduce and approximate the distances represented in the composer survey (see Section 2.2). To achieve this, a combination analysis approach was used to successively identify and discard individual acoustic descriptors. In modelling the space of composers based on a particular subset of features, a multivariate dissimilarity matrix was produced to provide a set of relative distances between each pair of composers in the acoustic dataset (with a value of zero corresponding to two composers having identical similarity). The capacity of a particular dissimilarity matrix to reflect the distances observed in the composer survey, in turn, reflects the capacity of the corresponding set of input acoustic features to represent the field from the perspective of its producers.

The full suite of combinations which are possible from 17 elements (n) taken k at a time for all $k < n$ involves 131,053 discrete combinations and was computationally prohibitive. The elimination of descriptors was therefore conducted iteratively by

taking all combinations involving the four largest values for k (i.e. $n > k > n$ - 5) and, for each descriptor, considering the average performance of all models in which it was featured. In these assessments, a multivariate dissimilarity matrix was calculated on each combination of descriptors, separately using each of Penrose and Mahalanobis distance measures. As per Manly (2016, p. 87), the Penrose distances were calculated using Equation 2.1, where f is the total number of acoustic descriptors, μ_{ki} is the mean of the individual descriptor f_k for composer i and V_k is the pooled covariance across all composers for feature f_k.

Equation 2.1 Penrose distance

$$P_{ij} = \sum_{k=1}^{f} \frac{(\mu_{ki} - \mu_{kj})^2}{(f \cdot V_k)}$$

Manly observes that a drawback of the Penrose calculation is that it makes no attempt to address the correlation between the different variables being considered. While a degree of correlation between acoustic descriptors has been addressed in Section 2.3.1.5 above, Mahalanobis distances are able to control for this correlation and were calculated using R's `biotools` package (da Silva, 2017). A limitation of Mahalanobis distances is that they require each population being considered (i.e. each composer) to have more observations (i.e. recordings) than descriptors – thereby limiting the number of composers between which distances can be calculated and adding to the imperative of achieving a parsimonious set of features.

Each combination's resulting dissimilarity matrices were then assessed using two scoring methods. As shown in Equation 2.2, the first simply involved calculating a score (O_{df}) for each combination of distance measure (d) and feature set (f) by summing the absolute values of the difference between each of the five ordinal rankings (r) of each composer (c) in the observed (o) (i.e. composer survey rankings) and modelled (m) datasets.

Equation 2.2 Ordinal ranking score

$$O_{df} = \sum_{c=1}^{c} \sum_{r=1}^{5} | o_r - m_r |$$

The second ranking score, Equation 2.3, proportionally penalises large distance ranking errors over smaller ones. For instances where the modelled ranking was incorrect, the distance between the modelled and ranked composer (d_{ij}), was added to the calculated score (D_{df}).

Equation 2.3 Distance-based ranking score

$$D_{df} = \sum_{c=1}^{c} \sum_{r=1}^{5} \begin{cases} d_{ij}, & o_r \neq m_r \\ 0, & o_r = m_r \end{cases}$$

The performance of each descriptor across all of the combinations in which it was included could then be assessed on any of these four metrics representing the combinations of distance calculations (Penrose or Mahalanobis) and score type (ordinal or distance-based). The worst performing descriptor was removed (thereby lowering the values for each of n and k) and the process repeated, generating a new set of combinations from the reduced set of features. After preliminary analysis, Mahalanobis distance using the distance-based scoring method was selected as the optimal metric to discern the worst performing feature. This was based on its continuous nature corresponding with the continuous nature of the dissimilarities it is ultimately aiming to produce, together with the consistency of its rankings relative to all four scoring methods. The results of the application of this approach, and the resulting refined feature set which models the space of composer distances, is detailed in Section 2.3.2 below.

2.3.1.7 Mapping Similarity

The approach to visualising the dissimilarity matrices produced by the multivariate acoustic analysis techniques above (and subsequent network analyses) is predominantly implemented by way of multidimensional scaling (MDS). In contrast to the approach of Principal Components Analysis (PCA), which emphasises the variance explained in its dimensionality reduction, MDS's focus is on the spatial representation of the proximities between objects (Kruskal & Wish, 1978) and is therefore well suited to observing the sorts of structure and patterns which emerge when applying the developed models to empirical data.

MDS takes a square dissimilarity matrix as its input and seeks to plot each item in n-dimensional space by selecting a set of coordinates which minimises a 'stress' function, the value of which effectively represents the badness of fit between the original proximities and their corresponding distances as represented by a particular configuration. R's `vegan` package (Oksanen et al., 2019) provides the `metaMDS` function, which was utilised for calculating distances using non-continuous (monotonic) scaling.

2.3.1.8 iTunes Library

The methodology above supports the identification of a refined feature set, together with the subsequent development of a dissimilarity matrix within the confined domain of Australian art music practice. To support subsequent analyses which are capable of going beyond this boundary (as in Chapters 3 and 5), however, it was necessary to acquire a broader catalogue of recorded music from which dissimilarity matrices could be generated on the same feature set for a given set of artists or composers. The use of iTunes recordings was limited to this purpose and did not inform any aspect of the selection of acoustic descriptors.

The approach taken was to harvest the entire catalogue of iTunes sample recordings. Access to these recordings, together with metadata pertaining to the track, its album, and artists, was obtained through publicly available APIs. A total of 67,561,130 audio files were obtained in this process, with a full set of audio features extracted for each recording using Essentia.

2.3.2 Acoustic model specification

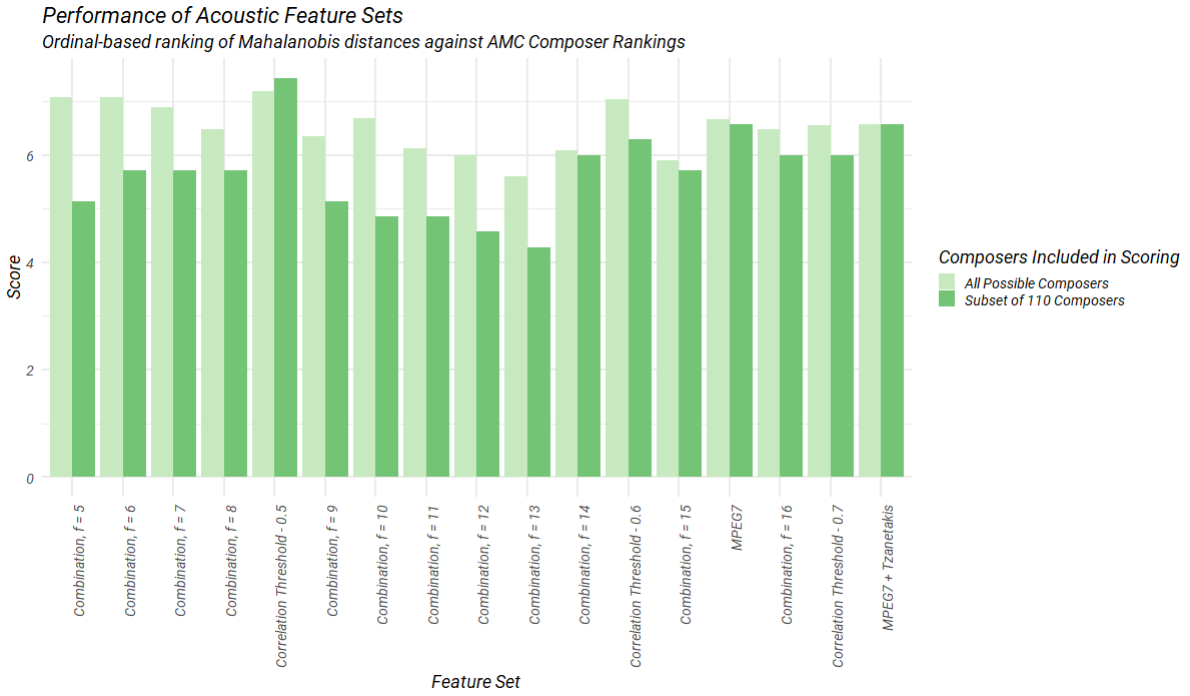
From the initial set of 327 acoustic descriptors, the dimension reduction stages detailed above (as applied to the AMC audio dataset) were able to produce 17 candidate descriptors after applying a correlation threshold of 0.7 (see 2.3.1.5). Identified in Table A.1 in Appendix A, these descriptors provide the starting point for refining the optimised model used to subsequently map the space of Australian art music composers. The list exhibits a mix of different categories of features, including low-level acoustic energy and sound envelope descriptors together with those based on the tonal, rhythmic and harmonic qualities of the audio signal.

In subsequently refining the model using combinations of these candidate features and evaluating model performance against the composer survey data (see 2.3.1.6), five additional feature sets were also included for comparison. The first three represent the feature sets derived from applying different correlation thresholds (see 2.3.1.5) set at 0.7 (17 descriptors), 0.6 (15 descriptors) and 0.5 (9 descriptors). Additionally, a set of features corresponding to the MPEG-7 set of audio descriptors was tested. The MPEG-7 feature set was designed to prioritise perceptual aspects of acoustic signals and this was further supplemented by a set which extends MPEG-7 with features identified by Tzanetakis and Cook (2002). Tzanetakis and Cook's work was similarly perceptually motivated, with the resulting combined feature set including a total of 25 descriptors.

Figure 2.2 shows the performance of the different acoustic feature sets, based on their capacity to reproduce the distance rankings found in the survey of AMC composers using the ordinal Mahalanobis scoring method. The feature sets in this figure are ordered by the number of descriptors included in the model (ranging from 5 to 25) and include two scores for each set, with lower scores indicating improved performance. Firstly, the score for 'All Possible Composers' assesses the performance of the feature set against all composers who meet the criteria for making Mahalanobis distance calculations (i.e. of having more recorded works (observations) in the dataset than there are features in the model). The number of composer survey responses included in the assessment is similarly bounded to those whose ranked candidates have more observations than features.

This approach effectively makes the basis for scoring uneven, as feature sets with a small number of features are required to discern between a much greater number of composers in making their rankings, and are also assessed against a larger number of composer survey ranking responses. The MPEG-7+Tzanetakis model, for instance, has 25 features and includes 110 composers with at least 26 recordings, compared with the model reduced by combination analysis to just five features and which has 310 composers. To address this, Figure 2.2 also shows a second score which assesses each model's performance against just the minimal subset of 110 composers.

Figure 2.2 Performance of acoustic feature sets, ordinal-based ranking of Mahalanobis-based distances

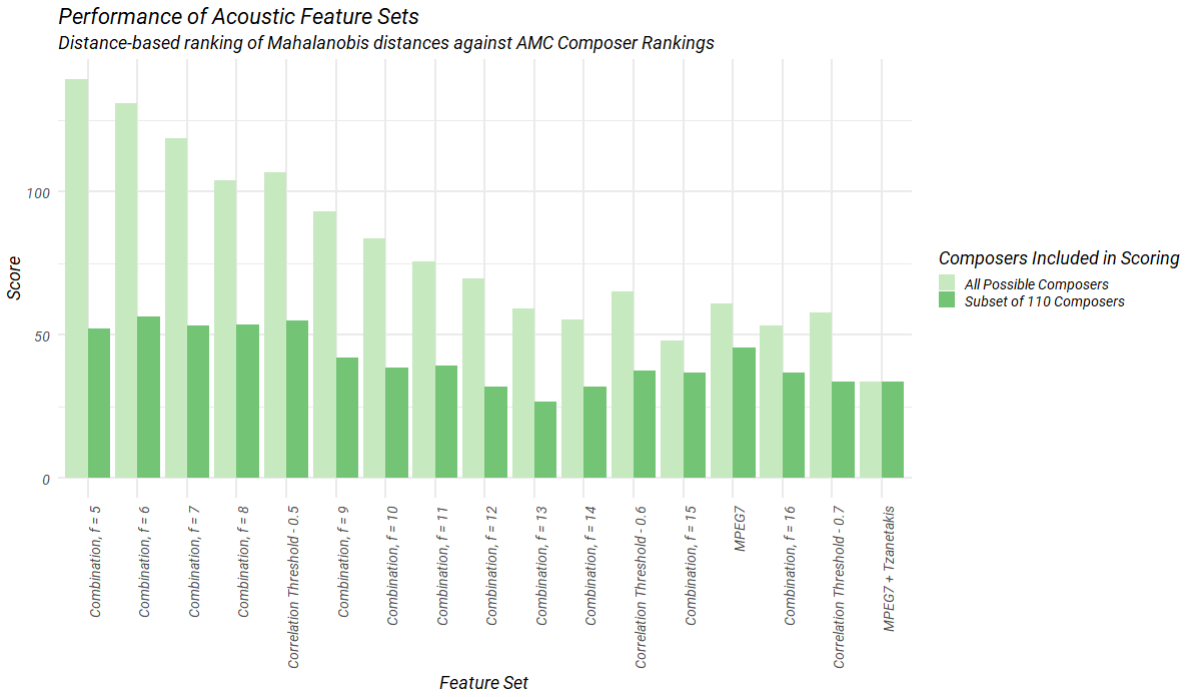


Scores presented on the y-axis represent the ordinal ranking score using Mahalanobis distances (see Equation 2.2) for each acoustic feature set (lower scores reflect improved model performance). Light green bars show model performance against all composers able to be included in the analysis; dark green bars show model performance against a common subset of 110 composers.

As the ordinal scoring method is based on its average performance against a set of five rankings, a random set of features would be expected to achieve a score of 8, which represents the average ordinal score across all 120 permutations of potential rankings. It should also be noted that the composer survey rankings against which the models were assessed did not involve random assignments of candidate composers. Instead, the candidates which survey respondents were ranking in terms of similarity all showed a level of acoustic similarity to the composer undertaking the ranking. This bias introduced into the survey data substantially increases the complexity of the task being assessed. Instead of being asked to discern a random sample of composers, it is being asked to distinguish among composers that already share a degree of acoustic similarity. In this context, the score achieved by the highest performing feature set – 4.29 for the 13-descriptor feature set measured against the subset of 110 composers – can be interpreted as reflecting a well-performing model.

It is interesting to observe that increasing the information in the model, in terms of the number of acoustic features, does not give a corresponding increase in the performance of the model. For the combination analysis derived models, the scores exhibit more of a U-shape, with reduced performance associated with both low and high numbers of features. The poor performance of models with a small number of descriptors is readily understandable in terms of the loss of information which is relevant to reproducing the composer-perspective viewpoint of the field. That having too much information also leads to degraded performance is less intuitive. It suggests that particular acoustic descriptors not only fail to add useful information to improve modelling the field based on the perspective of composers, but that they add inconsistent information which undermines the model's accuracy.

Figure 2.3 Performance of acoustic feature sets, distance-ranking of Mahalanobis-based distances



Scores presented on the y-axis represent the distance ranking score using Mahalanobis distances (see Equation 2.3) for each acoustic feature set (lower scores reflect improved model performance). Light green bars show model performance against all composers able to be included in the analysis; dark green bars show model performance against a common subset of 110 composers.

The performance of the different feature sets based on the Mahalanobis distance score, which proportionally penalises large distance errors over small ones, is shown

in Figure 2.3 and shows a similar U-shape when viewed from the perspective of the limited subset of 110 composers. The feature set comprising 13 descriptors again demonstrates optimal reproduction of the composer survey rankings, with performance degrading with both richer and sparser sets of features. When all possible composers are included in each feature set's scoring calculation, a more linear relationship between number of features and model performance can be observed. The correlation-threshold based models perform significantly worse, which can in part be considered a product of their constituent descriptors not having been optimised against the composer rankings.

Based on the performance of the different feature sets across both ordinal- and distance-based scoring methods, the 'Combination, f = 13' feature set was selected as the optimal set of descriptors for modelling the acoustic space of Australian art music. Its set of 13 descriptors is detailed in Table 2.1 below and includes a number of features common to both the MPEG-7 standard for audio content description, and broader research in music information retrieval and music perception. In this respect, the combination of descriptors included in this model is unsurprising in its inclusion of a balanced mix of tonal, rhythmic and low-level descriptors of the energy in the underlying audio signal. Tonal features are nevertheless strongly represented, suggesting their particular salience in discerning variation in Australian art music.

Table 2.3 Optimal 13-descriptor acoustic feature set

Feature Category	Feature	Statistic
Low Level	ERB Bands Flatness	Mean
Low Level	ERB Bands Kurtosis	Standard Deviation
Low Level	ERB Bands Spread	Standard Deviation
Low Level	Mel Frequency Cepstral Coefficient (MFCC) 1	Mean
Low Level	Mel Frequency Cepstral Coefficient (MFCC) 2	Mean
Low Level	Zero-crossing Rate	Mean Absolute Difference
Rhythm	Beats per Minute (BPM)	
Rhythm	Second-highest peak value of the BPM histogram	
Sound Envelope	Log Attack Time	
Sound Envelope	Temporal spread	
Tonal	Crest of the harmonic pitch class profile (HPCP) vector	Standard Deviation
Tonal	Shannon entropy of the HPCP vector	Mean Absolute Difference
Tonal	Strength of key estimation	

ERB flatness, for instance, is a measure of spectral flatness, which reflects the amount of 'noise' in a sound and which Dean and Bailes (2016) have identified as salient in predicting listeners' perceived affect. Spectral kurtosis has only gained attention relatively recently, having been interpreted as reflecting the frequency of transient patterns (Antoni, 2006) – which indicates whether music contains sharp and sudden changes, as opposed to music which is more subtle in how change is represented. Whereas spectral centroid has been associated with the 'brightness' of a sound, spectral spread measures the extent to which a signal is tightly concentrated around the centroid and which has been shown as relevant to distinguishing between classical, jazz and experimental musical styles (Giannakopoulos, 2014). Mel Frequency Cepstral Coefficients are traditionally used in speech recognition, however they have more recently been investigated with regard to their potential for modelling

music (Logan, 2000) based on their capacity to represent timbral features (Tzanetakis & Cook, 2002). The attack time of a sound is the delay between its onset and maximum intensity; commonly used in timbre classification, Caclin, McAdams, Smith, and Winsberg (2005) suggest that it is specifically relevant in distinguishing between 'impulsive' and sustained tones. As with spectral flatness, zero-crossing rate has been associated with the noisiness of an audio signal and has found applications in the classification of percussive sounds (Gouyon, Pachet, & Delerue, 2000). The harmonic pitch class profile (HPCP) based descriptors are based on the intensities of each of the semi-tone pitch classes in the Western musical scale and emphasise the importance of tonality based features in mapping the space of Australian art music. The remaining BPM and key estimation descriptors relate to more readily interpretable aspects of rhythm and tonality, with the latter reflecting how well a recording implements traditional tonal music structures.

While it is beyond the scope of this analysis to provide a comprehensive contrast between this acoustic feature set and others which have been identified in research, it is interesting to note the importance of discontinuity in modelling the space of Australian art music. Both spectral kurtosis and log attack time can be interpreted in terms of whether music incorporates either smooth or abrupt changes. In addition to the particular acoustic features in the optimal model, it is also of interest to observe that two of the descriptors utilise the mean absolute difference statistic. While the standard deviation provides a global measure of dispersion, the mean absolute difference – when applied to a time series, as in the case of an audio stream – provides a measure of whether a set of values occurs in either a smooth or relatively discontinuous manner. This statistic is not natively supported in either Essentia or MIR Toolbox (Lartillot, Toiviainen, & Eerola, 2008), which are two of the most widespread tools for acoustic feature extraction and analysis, and points to the importance of measuring this differencing effect in frame-based acoustic features.

2.3.3 Clustering

The ways in which the optimal 13-descriptor acoustic feature set identified above can be used to analyse the structure of the contemporary art music practice can firstly be considered in terms of its capacity to partition the field into cohesive groups.

Statistical cluster analysis methods offer a wide range of algorithms to achieve this task, with partitioning around medoids (PAM) constituting one such approach which is regarded as being resilient to the presence of outliers (Park & Jun, 2009). While any number of clusters can be discerned using PAM, the silhouette method (Kaufman & Rousseeuw, 1990) offers a means for identifying the ideal number of clusters based on optimising group cohesion. As shown in Figure 2.4, the silhouette method optimises at three clusters of composers. This optimal number only achieves an average silhouette width of 0.2, which is regarded by Kaufman & Rousseeuw as indicating relatively weak clustering cohesiveness. The lack of distinct groupings among Australian art music composers is further emphasised by a two-dimensional representation of the three-level clustering, shown in Figure 2.5, only being able to capture 58% of the variation in the data between its two axes.

Figure 2.4 Silhouette plot acoustic based clustering

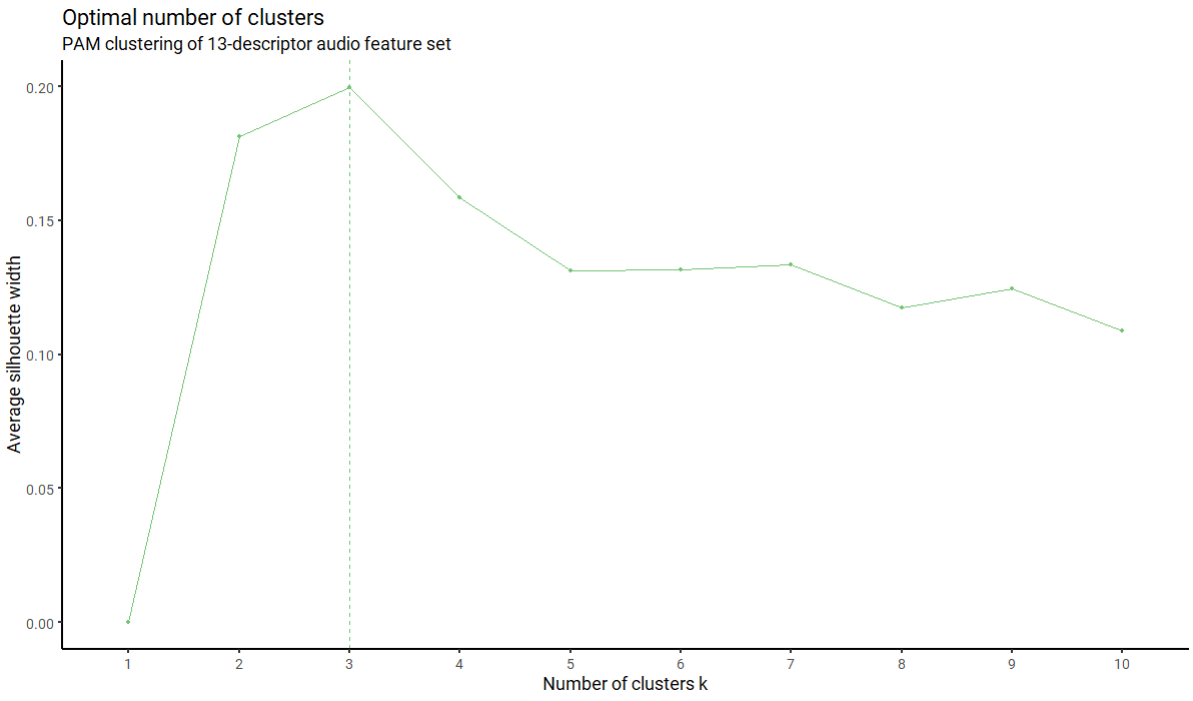
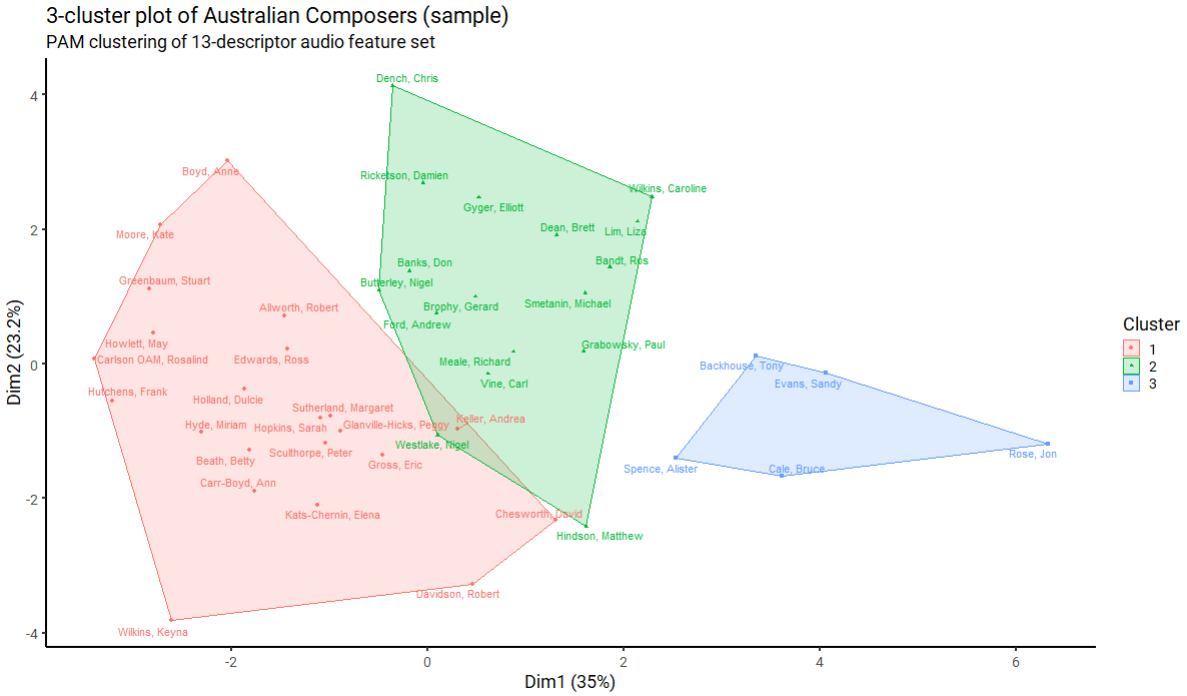


Figure 2.5 Acoustic based clustering of a sample of Australian composers



The percentages shown in the labels for each axis represents the proportion of data variance explained by each dimension.

Within these limitations, the clustering identifies two large clusters which each account for approximately 44% of composers, together with a third smaller cluster. Overlaying a sample of composers on these clusters in Figure 2.5 allows a consideration of the kinds of structuring principles which are identified in this analytical approach. Cluster 1 identifies a cohort of composers who operate in an idiom of traditional tonality, reflecting both composers of earlier generations (e.g. Miriam Hyde, Frank Hutchens, Margaret Sutherland) and contemporary composers whose work draws on largely conventional structures found in the canon of Western art music (e.g. Stuart Greenbaum, Ross Edwards). Cluster 2 brings together a group of composers, centred around the medoid of Gerard Brophy, whose work is more Euro-centric in exhibiting modernist stylistic influences. Finally, Cluster 3 includes composers who work in predominantly jazz-influenced idioms.

Overall, the cluster analysis suggests a field whose acoustic materiality is only able to partition the field into broad stylistic approaches. While Australian art music is commonly framed in terms of a collection of sub-fields and niche practices – a perspective which was often found in the interview data discussed in Chapter 4 – this

is not born out in the acoustic specificity of the music which is produced. While discrete communities of practice may be identified around influential figures, stylistic concerns, or technologies of production, the cluster analysis draws attention to the non-acoustic considerations which are necessary to sustain the identity of these practices. While Cluster 2 brings together a group of composers which audiences of contemporary Australian art music would identify as stylistically coherent, the remaining clusters are less well formed. Whereas the large size of Cluster 1 results in bringing together composers who would not typically be juxtaposed (e.g. Robert Davidson and Rosalind Carlson), Cluster 3 fails on account of its omissions – with jazz figures such as Andrea Keller not included.

That the optimal model had weak group cohesiveness and was only able to partition the data into three clusters further suggests a field which is marked by hybridity. Composers such as Paul Grabowsky and Matthew Hindson, for example, represent a fusion of disparate styles, while the general oeuvre of contemporary composers is less marked by the sort of internal consistency suggested in Bourdieu's mapping of the French nineteenth century literary field. Not only can composers undergo significant stylistic shifts in their careers, as with Richard Meale's eventual rejection of modernism, but composers may also pursue careers which involve them simultaneously working across *multiple* styles. In addition to the potential of creating a unique compositional voice by *fusing* styles, composers such as Nigel Westlake can be seen balancing chamber music commissions with the much more lucrative domain of composing for the screen. A different from of hybridity can be seen in an emerging composer such as Keyna Wilkins, who describes herself as "at home in many musical worlds" (Wilkins, 2020) and works across traditional jazz, theatre and impressionist influenced chamber music. Such hybridity represents a challenge, therefore, to mappings of the field which assume the unity of the composer's artistic voice. This is intrinsic to the particular multivariate approach employed in the current analysis and alternate approaches, such as principal components analysis and factor analysis, offer other avenues for modelling distances at the level of individual observations.

2.3.4 Mapping acoustic features

While the cluster analysis approach to mapping acoustic similarity above was only able to achieve weakly cohering clusters, multi-dimensional scaling offers an alternative means for visualising and investigating the similarity relationships among composers. This analytical approach took the optimal 13-descriptor acoustic feature set's dissimilarity matrix and processed it using non-metric multidimensional scaling (MDS) to produce both two and three-dimensional configurations of the underlying proximities between composers. The two-dimensional configuration resulting from this approach yielded a stress value[10] of 20.42%, with this figure dropping to 13.06% on the addition of a third dimension. Work by Sturrock and Rocha (2000) on evaluating stress scores demonstrates that the threshold below which we can confidently assume a non-metric configuration is non-random is dependent on both the number of dimensions available to fit the items and the number of items themselves. They found that the stress threshold was asymptotic as the number of items increased and that for a non-metric MDS configuration involving 100 items, stress scores of 39.6% for two-dimensions and 30.5% for three-dimensions, indicated that the location of items produced by the MDS would have a 1% chance of being randomly arranged. It can be confidently stated, therefore, that both the two and three dimensional representations of the 173 composers in the acoustic feature dissimilarity matrix are capturing aspects of the underlying structure of proximities.

In addition to stress-based assessments of an MDS model, a linear R-squared can be calculated based on the squared correlation coefficient between observed proximities and fitted distances. The respective values for each of the two- and three-dimensional MDS configurations are 0.847 and 0.916, which can be interpreted as a good fit of the data (Hair, 2019). A visual representation of model fit is provided in the Shepard plots[11] in each of Figure 2.6 and Figure 2.7 below. In both instances, the model is

[10] Stress represents a goodness of fit measure in MDS, with a value of zero representing a perfect correspondence between the distances between items in the original data and the fitted MDS model.

[11] Shepard plots provide scatterplots of the distance between pairs of items in the observed data on the x-axis and the distances in the modelled configuration on the y-axis. They also provide a monotonic line of best fit.

shown to exaggerate distances between more proximate composers and under-estimate them in the most extreme instances.

Figure 2.6 Shepard plot, 2-dimensional configuration of acoustic feature based dissimilarity matrix

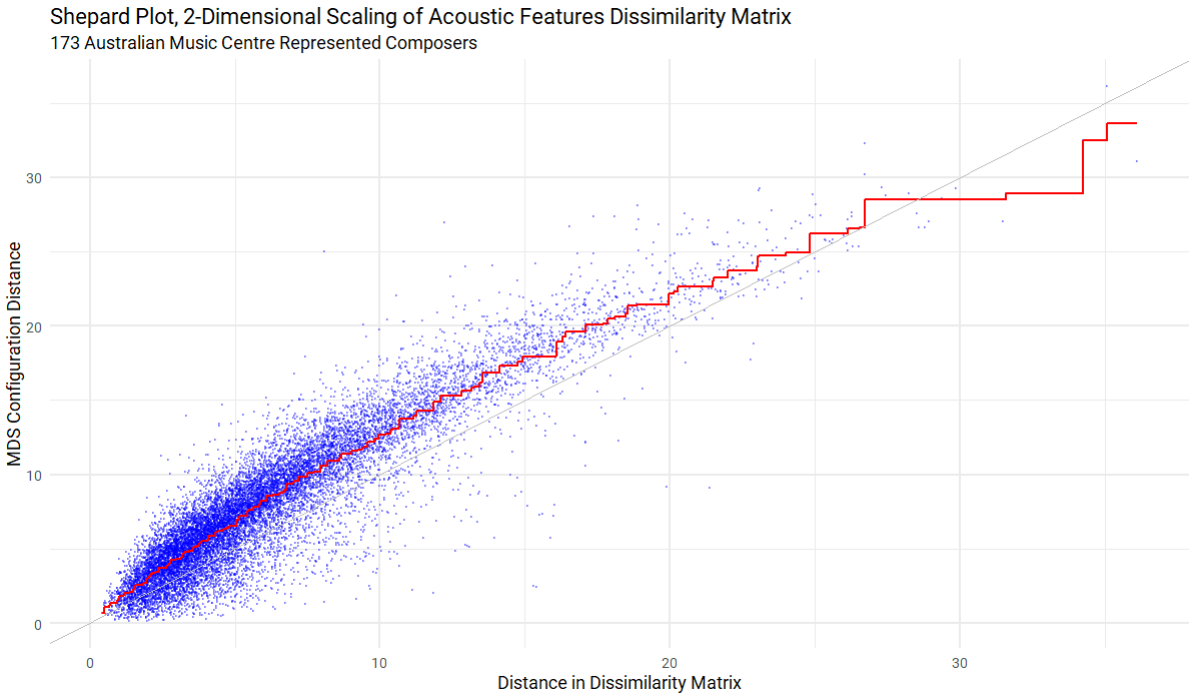
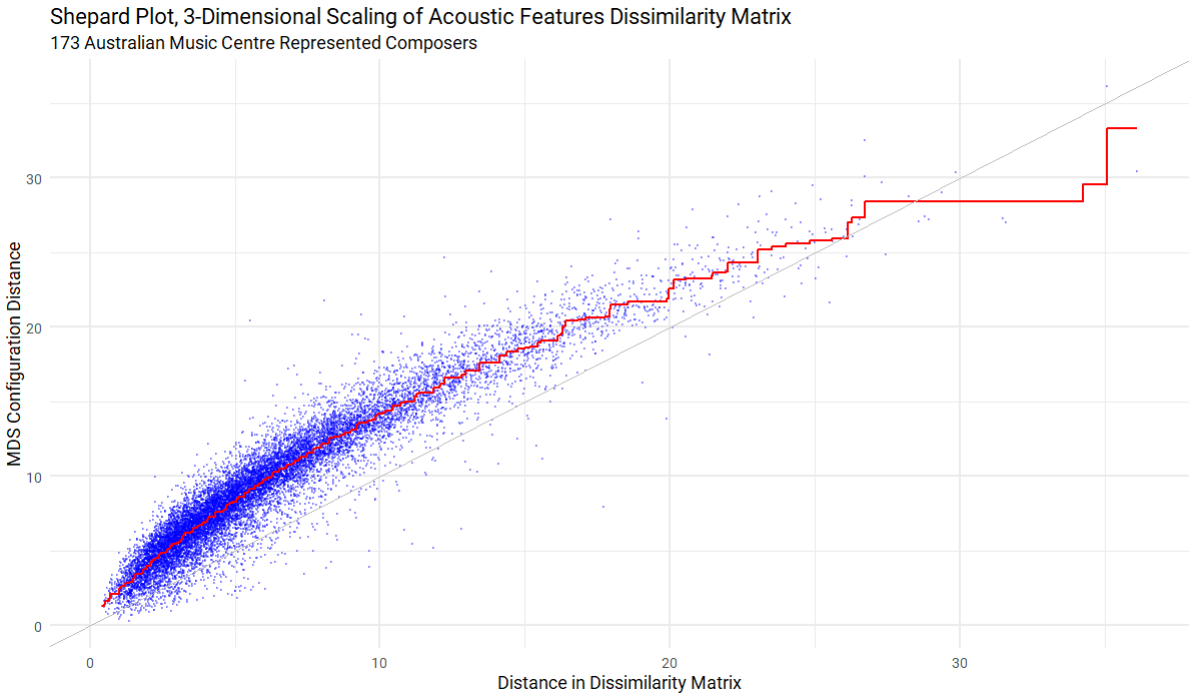


Figure 2.7 Shepard plot, 3-dimensional configuration of acoustic feature based dissimilarity matrix



Finally, the Euclidean distances produced by each MDS configuration can be contrasted against the composer survey rankings and the degree of degradation which results from representing the acoustic model's dissimilarity matrix in n-dimensions. In this regard, the three-dimensional representation can be seen to perform significantly better than its two-dimensional counterpart, with ordinal-based scores improving from 7.26 to 6.42, and distance-based scores improving from 94.84 to 84.21.

To visualise and aid interpretation of the resulting MDS configurations, a sample of 42 composers was selected to avoid over-crowding the figures with all 173 composers. To further simplify analysis, only two dimensions were plotted at a time. Figure 2.8 shows the 2-dimensional representation of composers, with Figure 2.9 and Figure 2.10 showing the relationship between the first and each subsequent dimension of the 3-dimensional representation. The oppositions which are captured in the three-dimensional model are summarised in Table 2.4 below. As a model whose underlying proximities are informed by acoustic features trained on composer rankings of distances in the field, the first two dimensions present contrasts which are readily identifiable as structuring principles of Australian art music practice. By contrast, the less immediately identifiable nature of the third dimension – which is analysed further below as a possible distinction between themes of nature and serialism – points to the capacity of the modelling approach to uncover latent organising principles which can disrupt common understandings of the field.

Table 2.4 Summary of dimensions in 3-dimensional MDS

Dimension	Negative	Positive
1	Modernism	Jazz and minimalism
2	Traditional	Experimental
3	Serialism	Spiritualism and nature

Figure 2.8 2-dimensional MDS map of selected Australian composers, based on acoustic feature based dissimilarity matrix

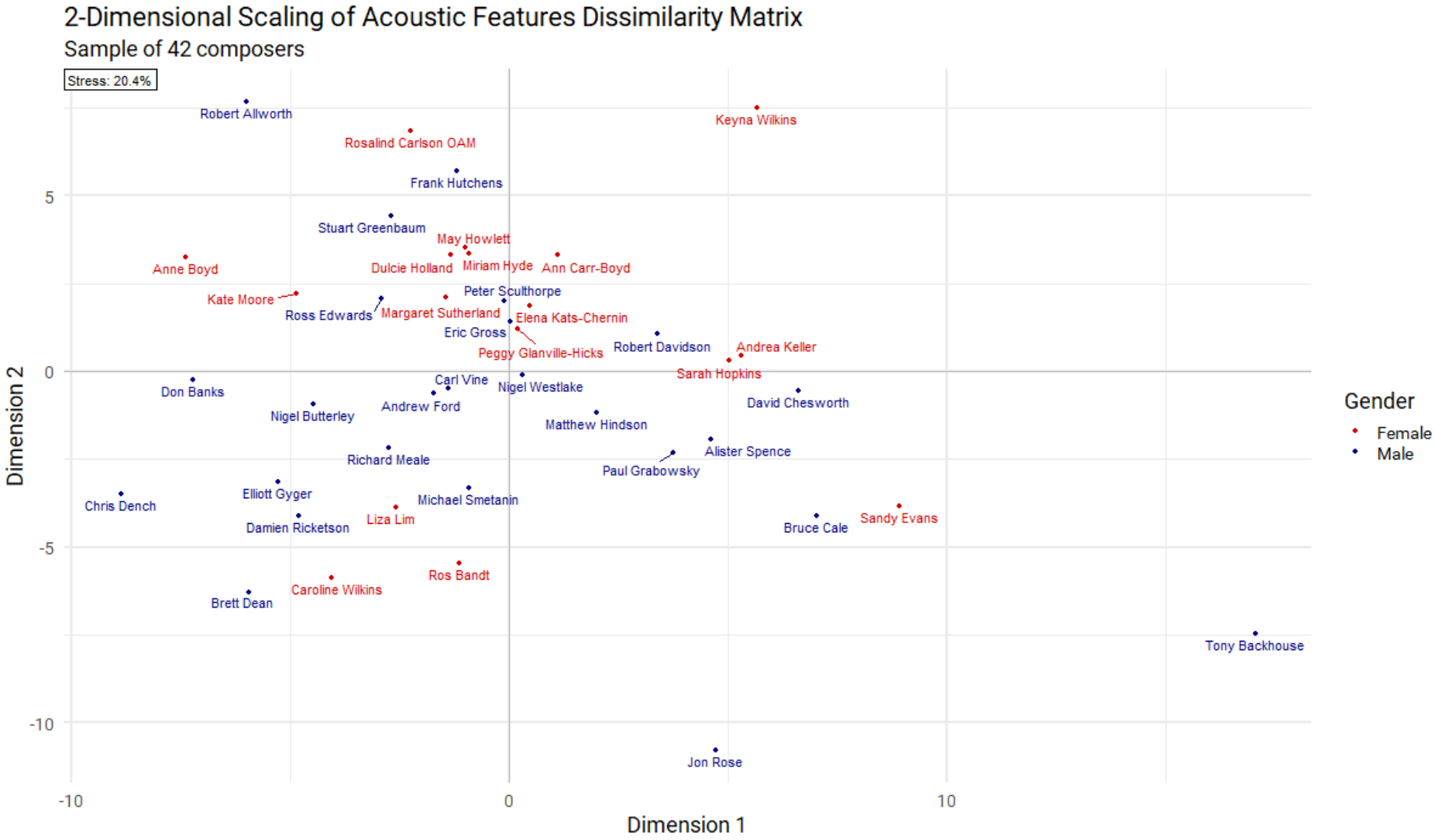


Figure 2.9 3-dimensional MDS map (dimensions 1 and 2) of selected Australian composers, based on acoustic feature based dissimilarity matrix

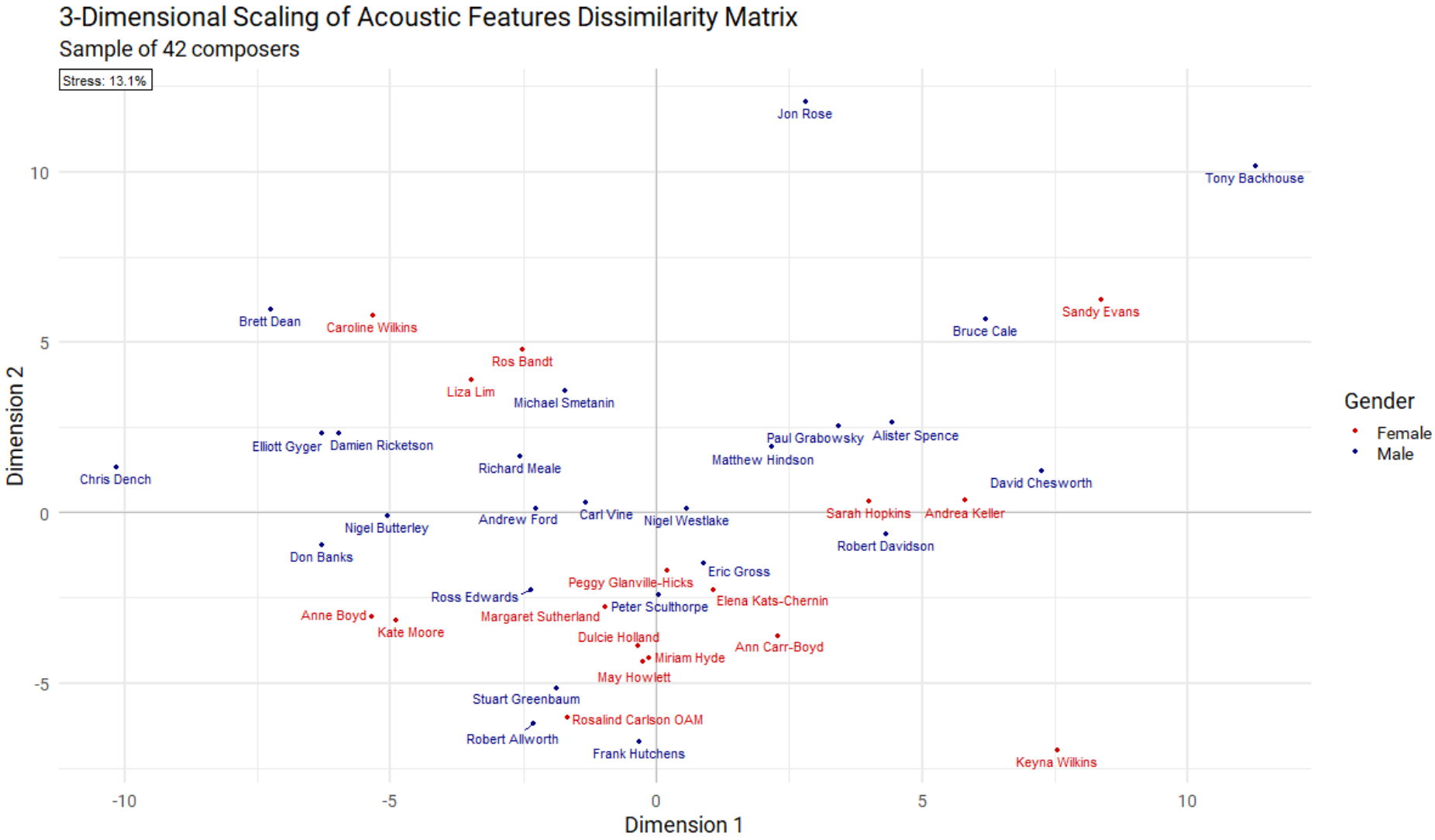
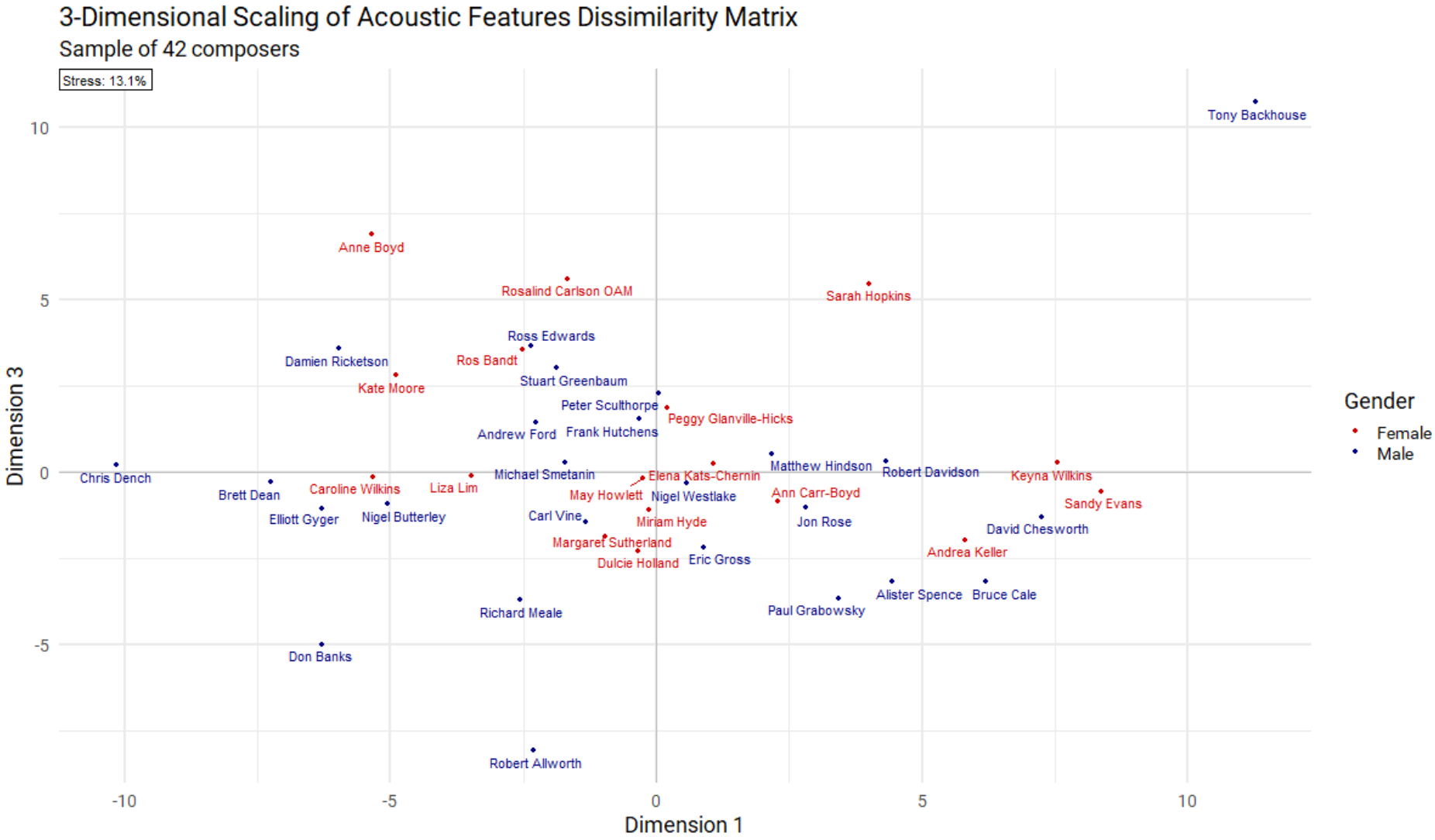


Figure 2.10 3-dimensional MDS map (dimensions 1 and 3) of selected Australian composers, based on acoustic feature based dissimilarity matrix



In both the two and three dimensional maps, the structure captured in Dimension 1 readily corresponds to commonly understood delineations of the field. This interpretation rests on an opposition between modernist influences on the negative end of the spectrum (as represented to the greatest extreme by Chris Dench), and jazz and minimalist influences on the positive side. The importance of modernist influences as an organising principle of Australian art music was similarly found in Cluster 2 of the previous cluster analysis, with the spectrum of values offered by MDS placing this in opposition to specific contrasting musical idioms.

Dimension 2 also captures a common feature of the field in both two and three dimensional representations, though the poles have been inverted in the three-dimensional configuration. Contrasting composers who sit on a similar position on Dimension 1 but are divergent on Dimension 2, such as Keyna Wilkins and Sandy Evans, or Stuart Greenbaum and Liza Lim, the former examples can be regarded as working in more traditional and established styles compared to their more experimental counterparts. This is reinforced by the way in which Dimension 2 reflects generational differences between composers. In Figure 2.9, the upper half of the map features only a single deceased composer. When the mean year of birth is considered for each half of the two and three dimensional maps, the 'traditional' side of the spectrum has an average of 1940, compared with averages of 1956 and 1957 for the two and three dimensional configurations respectively. Performing linear regressions to predict each of Dimension 1 and Dimension 2 based on year of birth similarly reflects this trend, with only the latter regressions having a significant effect ($p < 0.001$) and modest adjusted R-squared values of 0.095 (2 dimensions) and 0.10 (3 dimensions).

When extending the MDS to a third dimension, interpretation of the reflected structure is less straight forward, as it begins to draw composers into less obvious associations and oppositions. This is both a strength and weakness of the MDS process – and dimensionality reduction techniques in general – in that it can disrupt orthodox understandings of how the field is understood, but does so without offering a discursive framework on which to base its findings. As noted previously, the differences captured in the third dimension are clearly statistically relevant in

representing the composer survey rankings, in that they substantially improve the ordinal and distance-based scores over the corresponding scores from its first two dimensions. Considering those composers in the upper half of Figure 2.10, many of them can be seen to employ nature and environmental elements (either stylistically or materially) in their compositional styles.

It is useful to compare these results with statements made by several Australian art music composers themselves, as well as by other commentators and sources. This is not to privilege one mode of describing music composition over another, but rather to understand the possibilities of coordinating music features, in their apparent 'objectivity', against other spaces of this cultural field characterised by such commentary. Ross Edwards, Sarah Hopkins, Kate Moore, Ros Bandt and Rosalind Carlson, for example, have all been said to fit this description of nature and environmental influences and provide a discursive framework for understanding the juxtaposition of composers in Dimension 3. Carlson, for instance, states that "my aim in musical composition is to describe in sound an interpretation of aspects of my natural environment" (Carlson, 2017). The most extreme composer on this axis, Anne Boyd, is perhaps not known for incorporating explicitly environmental themes, but has instead stated that she foregrounds music's spiritual and meditative qualities in her work. Understanding this as a basis for the spectrum of composers in Dimension 3 is further evidenced by considering the distribution of composers whose works have been catalogued in the Australian Music Centre's database as concerning themselves with the thematic subject of 'Environmental themes'. The application of this cataloguing term is not comprehensive, however when considering all 173 composers featured in the configuration, 71% of instances of the cataloguing term are accounted for by composers exhibiting positive values for Dimension 3. When considering the 'Spiritual and Sacred Music' cataloguing subject, the corresponding figure rises to 80%.

A tentative possible interpretation of nature and spiritual aspects of composition at one extreme necessarily poses the question of what might be considered as occupying the opposing pole on Dimension 3. The three most extreme composers, Robert Allworth, Don Banks and Richard Meale have all acknowledged or been described as

having been strongly influenced by Arnold Schoenberg. The negative pole of this dimension can therefore be associated with serialist[12] approaches to composition which eschew traditional hierarchical approaches to tonality. This is reinforced by returning to the acoustic features, specifically the tonal descriptor estimating the strength of the musical key associated with each recording. The Pearson correlation between a composer's score for Dimension 3 and the mean key strength found in their recordings is 0.68 ($R^2 = 0.46$), which suggests a substantial positive linear relationship between the stability of tonal structures in a composer's music and their position in the third dimension. Three of the thirteen descriptors in the acoustic model in Table 2.3 were based on elements of tonality and this further emphasises its role as a relevant structuring principle which determines the distance between Australian art music composers.

It is also interesting to observe that whereas the positive pole of Dimension 3 is identifiable in discursive descriptions of works, and the cataloguing labels they are assigned, the same is not true for the negative pole. As shown in the discussion of serialism and tonality, however, this asymmetry is not simply based on the negative pole representing an absence. Rather, it suggests that only particular poles have been successful in achieving a level of discursive expression and representation. It is not that the labels which might be used to describe the negative pole of Dimension 3 do not exist, however they are more technical and musicological in contrast to the thematic descriptions able to be applied to the positive pole. This reinforces that the poles presented by MDS analysis do not simply signify a presence or absence, but juxtapose two distinct qualities. These qualities are not necessarily entirely oppositional in nature, but they nevertheless bifurcate the social space of cultural production. Instead of a conception of distance which separates items on a scale of mutually exclusive possibilities, it suggests a formulation which is not strictly disjunctive.

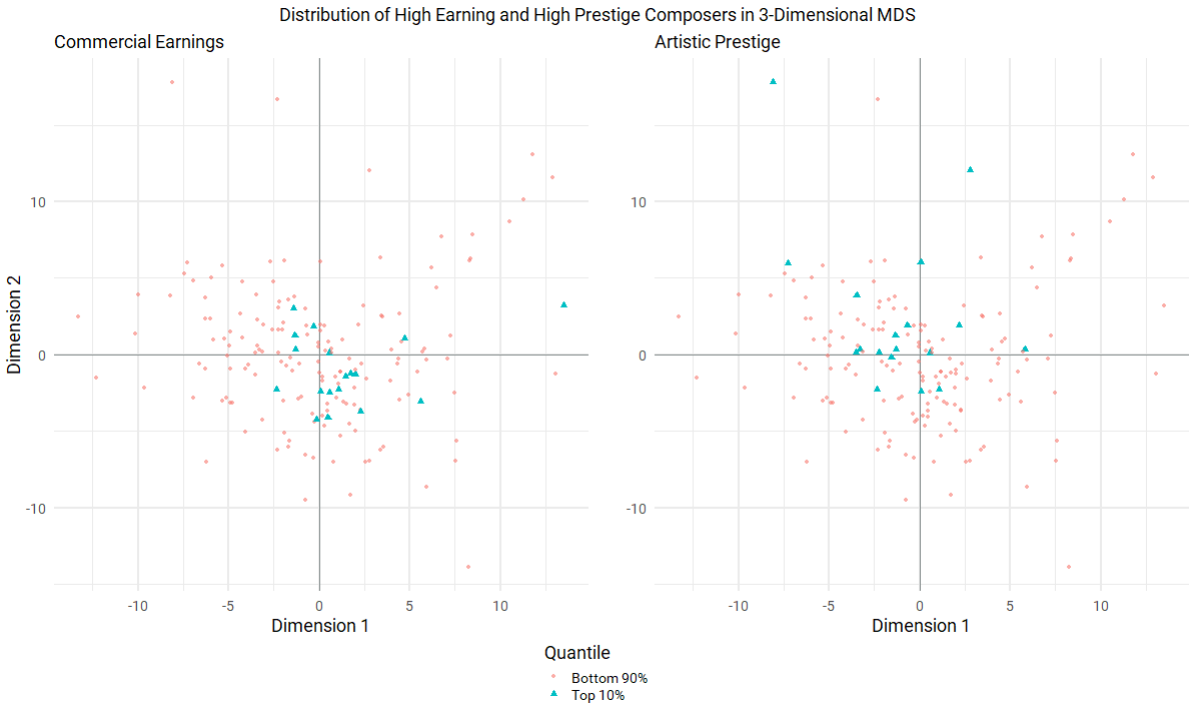
[12] Serialism, particularly the pitch serialism associated with Schoenberg's twelve-tone method of composition, gives equal importance to each of the twelve notes of the chromatic scale. This is in contrast to the traditional tonality of Western music which establishes a hierarchy of pitches based on a particular musical 'key' (e.g. F major; G minor).

In addition to mapping the location of composers based on acoustic similarity in n-dimensions, the approach of MDS also permits overlaying other variables to observe how they are distributed. Symbolic and economic capital have been theorised as dominant structuring principles which relationally position actors in fields of cultural production (Bourdieu, 1993). Measures of these forms of 'capital' specific to the activity of composers in the field of music are developed and detailed in Section 3.3.5 below. Overlaying this data on to Dimensions 1 and 2 of the three-dimensional map further informs how these concepts function in the domain of Australian art music. While no substantial significant linear relationships exist between either dimension and the operationalised measures for economic and symbolic capital, Figure 2.11 plots the top 10% of composers across each of these two measures as blue triangles, with the remaining 90% represented as red dots.

Those composers earning most from the performance of their music cluster fairly tightly around the centre of both dimensions, suggesting that financial success among Australian art music composers is to be found squarely in the middle of the road. No extremes on Dimension 2 are included among the top earning composers, suggesting that neither extreme experimentalism or conservatism is financially rewarded. The presence of more high earning composers in the lower half of the map can be seen to reflect the generational shift evident in that plane, and potentially favouring those who have had more time to establish their careers. As noted in the Conclusion chapter, this points to a limitation of the current study's point-in-time analysis which could be addressed through a longitudinal study to investigate how artistic trajectories unfold and the capacity for artistic pioneers to either shift the field towards their own practice, or otherwise shift themselves to the established centre. In either scenario, a link between similarity and familiarity emerges. Sustaining a longer career gives more time for a composer's work to receive exposure and canonisation, increasing their familiarity among audiences, which in turn further contributes to the accumulation of capital. Successful composers become less distant and more stylistically central within the field, but do so with the risk of losing credibility among devotees of the avant-garde.

The distribution of composers with high levels of artistic prestige loosely reflects a vertical and horizontal mirroring of the commercial distribution of top decile composers. There are only a small number of composers in the bottom half of the map, with a much stronger representation found in those who exemplify the artistic values of experimentalism more favoured in fields of restricted production. While there is moderately more spread across Dimension 1 among the high scoring artistic prestige composers, there is no strong tendency toward either the left or right-hand side of the map for either top-ranking artistic or commercial composers. In both instances, being a pioneer on the extremes of one's artistic practice is neither financially nor symbolically rewarded.

Figure 2.11 Distribution of high earning and high prestige composers in 3-dimensional MDS



2.3.5 Summary

The acoustic feature analysis here demonstrates the capacity to derive a model for representing the space of Australian art music which is specific to the organising principles of the field as expressed by its producers. Instead of generic and standardised approaches to representing the acoustic space of music, such as variance inflation factor (VIF), the thirteen descriptors identified in Table 2.3 have been selected to best reproduce how composers themselves perceive of distance in the field. This composer perspective was derived using the composer similarity ranking

survey discussed in Section 2.2. The resulting combination of tonal, harmonic, timbral and rhythmic features are of particular interest for both the relative significance afforded to tonal descriptors and for the importance of discontinuity in representing the space of Australian art music. Beyond the feature set itself, the analysis also demonstrates the capacity for acoustic features to produce dimensional mappings which represent stylistic influences. The cluster analysis, while only exhibiting moderate statistical coherence, suggests that particular sub-genres, namely jazz, have been able to maintain their distinct identity, whereas only broad divisions were otherwise observed in art music practice. The dimensions produced through MDS supported interpretations along stylistic and generational approaches. That they readily lend themselves to such interpretation further supports the utility of an acoustic model, trained on composer perspectives of the field, in representing the space of Australian art music producers from this producer orientation. It demonstrates the capacity for the distances which emerge from carefully selected acoustic features to reproduce a phenomenological sense of distance observed among the field's composers.

This research also suggests a number of avenues for future enquiry. The ways in which composers and other practitioners in the field respond to the maps which have been produced by this analysis would be informative in itself. The resulting gaps and inconsistencies revealed between acoustic and composer understandings of the field would allow for an interrogation of how these discrepancies emerge and are discursively articulated. Furthermore, beyond the synchronic nature of the current analysis, there is scope to consider the trajectories of composers and their musical output over time. Just as Richard Meale's compositional style shifted and evolved in his relationship to the tenents of modernism, there are limits to representing composers as the point-in-time acoustic sum of their oeuvre. As discussed in the Conclusion, an analysis of how composer trajectories locate themselves over time would also allow a consideration of how the accumulation of symbolic and financial capital serves to relationally shift the output of composers within the broader field of production, but also the degree to which positions in the field evolve 'outside the work' in response to the conditions of cultural production.

2.4 Artistic network analysis

In contrast to mapping the field based on *self-declared* relationships in the composer survey, network analysis methods permit rendering the field of Australian art music practice based on *observable* relationships and affiliations between composers. In network theory, the concept of distances between actors becomes a consideration of the length of the shortest path of relationships (edges) between each actor (vertex) and other vertices in the network. These distances can be further refined by taking into account an edge 'weighting' which reflects the varying intensity of the relationship between two actors.

Processes of selecting repertoire, presenting concerts and releasing recordings all represent mediations which variously assemble and juxtapose different composers from the field of Australian art music. The cumulative effect of these curatorial processes presents an opportunity to consider the varying intensities (as network edges) with which different pairs of composers (as network vertices) are drawn into these mediations alongside each other. In particular, the resulting relative mathematical network distances between all composers can be expressed as mappings of the field which reflect how the field is perceived and assembled by cultural intermediaries as they make their curatorial decisions. In contrast to the stylistic notions of distance which predominate among composers, curators face a different set of commercial imperatives in assembling the space of producers.

In addition to generating resulting dissimilarity matrices and maps based on these distances, the analytical methods supported by network analysis are also utilised to further investigate the structure of the field of Australian art music. Measures of network cohesiveness, the identification of sub-groups and community detection, together with the prominence of individual actors, are all employed to consider the types of knowledge which can be generated on how the field of art music can be conceptualised and understood. In addition to these descriptive modes of analysis, the chapter also incorporates network modelling techniques to consider endogenous and exogenous factors which can be identified as giving rise to the observed networks. In addition to the typical forms of clustering commonly observed in networks, composer

attributes such as gender and age, together with artistic prestige and commercial success are among the variables examined.

2.4.1 Methodology

To conduct this analysis, the quantitative techniques of network analysis were applied to a series of datasets compiled to provide static representations of the kinds of artistic networks which arise from curatorial and biographical practices in the field. These networks were primarily derived by drawing upon the detailed data in the AMC's catalogue of composers and their works, recordings and performances. Six discrete networks in total were constructed, four of which were based on curatorial processes which introduce a varying degree of proximity between composers: (i) being co-featured on commercial CD releases; (ii) being co-programmed at public concerts; (iii) having their works presented at the same venues; and (iv) having their works presented by the same performer. A further two networks were constructed based on biographical features of the field: (v) biographical influences between composers; and (vi) self-reported artistic similarity between composers, both of which were derived from the composer survey in Section 2.2. Whereas the curatorial networks are all able to reflect the varying intensity with which two actors are associated with each other, the biographical networks only reflect a binary presence or absence of a relationship. Conversely, the relationships depicted in curatorial networks are all undirected in their nature, whereas the biographical relationships capture directionality in the way they draw composers into associations.

The technical realisation of these networks was achieved by treating the combined set of composers, performers and venues referenced across all of the networks as a common set of shared vertices. The networks were then effectively constituted as a multigraph, with the combined relationships identified in each of the six artistic networks represented as a discrete set of edges linking a subset of the shared vertices. The vertices were subsequently decorated with the eleven attributes listed in Table 2.5. Technically, this realisation was prepared utilising R's `tidygraph` package (Penderson, 2019), which provides wrappers around the underlying `igraph` package (Csárdi, 2019) to aid the preparation and manipulation of graph objects.

Table 2.5 Artistic network vertex attributes

#	**Attribute**
1	Gender
2	Date of birth
3	Date of death
4	State (Australian province) where the actor is primarily active
5	AMC representation status
6	Number of works composed in the AMC collection
7	Number of commercial CDs (in the AMC collection) on which they are featured
8	Number of commissions documented in the AMC collection
9	Number of public concert events (in the AMC database) in which they are featured
10	Commercial earnings[13]
11	Artistic prestige score[14]

Details on the data used to derive each of the six artistic networks is detailed below, with the total number of vertices and edges included in each network presented in Table 2.6.

[13] The method of deriving this attribute is detailed in Section 3.3.5.2.

[14] The method of deriving this attribute is detailed in Section 3.3.5.2.

Table 2.6 Vertices and edges in artistic networks

Artistic Network	Network Type	Vertices	Edges
Commercial CD affiliation	Bipartite[15] projection, weighted	655	5,375
Concert program affiliation	Bipartite projection, weighted	1,256	8,025
Venue affiliation	Bipartite projection, weighted	2,406	7,798
Performer affiliation	Bipartite projection, weighted	8,525	17,617
Biographical influences	Unweighted, directed	434	761
Self-reported similarity	Unweighted, directed	405	638

2.4.1.1 Commercial CD affiliation

Commercial CDs represent the outcome of curatorial processes which bring together music by a set of composers who are regarded as representing a degree of artistic or stylistic similarity. This dataset was constructed in the form of unweighted bipartite edges created by connecting each composer with each commercial CD release on which their work has been featured. Composers and CDs represent the two distinct sets of vertices. A weighted bipartite projection of the composer vertices was then produced using simple weightings based on the number of common CD associations.

2.4.1.2 Concert program affiliation

As with commercial recordings, concert programs represent a curatorial decision-making process which brings selected composers together based on a perceived degree of artistic similarity. A set of unweighted bipartite edges was created by connecting each composer with each public concert program in which their work has been featured. Composers and concert programs represent the two distinct sets of vertices. A weighted bipartite projection of the composer vertices was then produced using simple weightings based on the number of common concert program associations.

[15] Bipartite networks refer to graphs in which edges are only formed between two mutually exclusive sets of vertices (e.g. composers and CDs). Projections of these networks can be produced which only include a single set of vertices, with weighted edges produced based on the frequency with which pairs were connected to common neighbours in the original network.

2.4.1.3 Venue affiliation

The collection of composers whose music has been presented at particular venues represents a third form of curatorial decision making. While some venues will have a narrow and exclusive stylistic focus, it is anticipated that venues will provide a looser threshold for positing an affinity relationship between composers. A set of weighted bipartite edges was created by connecting each composer with each venue where their work has been performed in public concerts. Each edge's weighting was based on the number of occasions a composer's music has been presented at a particular venue. Composers and venues represent the two distinct sets of vertices. Bipartite weighted projections of each set of vertices are created using simple weightings based on the number of common associations.

2.4.1.4 Performer affiliation

The repertoire choices made by performers over the course of their careers offers a final curatorial practice which is examined in terms of how it assembles a corresponding map of composer relationships. A set of weighted bipartite edges was created by connecting each composer with each performer who has presented their work. Each edge's weighting was based on the number of occasions a performer has presented each composer's music. Composers and performers represent the two distinct sets of vertices. In instances where the same individual acts in the capacity as both a composer and a performer, the vertex is duplicated in each set. Bipartite weighted projections of each set of vertices are created using simple weightings based on the number of common associations.

2.4.1.5 Biographical influences

In addition to networks formed from curatorial decisions in the presentation of contemporary art music, stylistic and artistic relationships can also be observed from the biographical relationships which are found in how the field conceives of itself. The AMC's website features 300-400 word biographies of each represented composer, a standard feature of which is listing other composers who have acted as pedagogical and stylistic influences. A set of unweighted directed edges was created by automated text analysis of these biographies, with each reference to another composer created as a directed edge indicating a biographical influence.

2.4.1.6 Self-reported similarity

A second source of biographical influences was obtained from the composer survey (see Section 2.2 and Appendix B) by utilising responses to the open-ended question of which composers respondents considered most similar to their own practice. A set of unweighted directed edges was created indicating self-reported similarity, with each reference to another composer created as a directed edge from the survey respondent to the referenced composer.

2.4.2 Network characteristics

The overall network characteristics for the six artistic networks, as summarised in Table 2.7, reflect generally sparse networks encompassing between 370 (Commercial CD affiliation) and 583 (Performer affiliation) composers. A further vertex-induced subgraph[16] was generated for the self-similarity network by only including vertices corresponding to AMC-represented composers, resulting in a network with just 164 vertices, which emphasises the challenges which such low density networks present for the analysis of fields. Conversely, the impact of introducing a higher threshold for a relationship to exist in the venue-based and performer-based networks was achieved by generating edge-induced subgraphs. Specifically, edges in the original bipartite graphs (i.e. before producing the composer-vertex projection) required a weighting of two or more to eliminate the 'noise' of one-off associations which would otherwise draw composers into a network relationship.

The different bases for producing the networks – based on CD, concert, performer and venue affiliation, together with biographical and self-reported influences – generate three separate patterns of graph density (the overall likelihood of pairs of actors to be connected to each other, measured as the number of actual edges relative to potential edges in the graph), degree distribution (the proportion of vertices with different numbers of edges connecting them to other vertices) and transitivity (the likelihood of triples of actors to be connected to each other, measured as the number of actual connected triples relative to potential connected triples in the graph). The

[16] A subgraph is a subset of a larger network. A vertex-induced subgraph filters the set of vertices on a given criterion and only retains the edges between those remaining nodes. An edge-induced subgraph firstly filters on edges and then removes isolate vertices.

affiliation networks based on shared venues and shared performers both exhibit relatively high values of density and transitivity. This is in contrast to the more modest figures for the concert programming and commercial CD affiliation networks and the even sparser networks derived from biographical and self-reported similarity relationships. Sparsity can be interpreted as representing more significant and less contingent relationships. While the weighted affiliation networks include a measure of this contingency in the intensity of their edges, it suggests that the curation of concerts and CDs involves a greater threshold for drawing composers into an association when compared to performers and venues. The three patterns can be seen to reflect the different intensity thresholds which apply to the relationships between vertices captured in the different networks. The curation processes which determine which composers' music will feature at a particular venue, or be presented by a particular performer, are relatively loose and draw a far higher number of composers into first-order relationships when compared to the more tightly curated associations which occur in commercially released CDs and concert programming.

Table 2.7 Characteristics of artistic networks and sub-graphs

Network	Subgraph	Vertices	Edges	Density	Transitivity	Components	Proportion of network in largest component[17]	Diameter[18]
Commercial CD affiliation	All nodes and edges	370	3507	0.051	0.381	3	98.9%	7
Concert program affiliation	All nodes and edges	477	4839	0.043	0.284	2	99.6%	12
Performer affiliation	All nodes and edges	583	32,075	0.189	0.526	2	99.7%	7
Performer affiliation	Original bipartite edge-weight >= 2	558	31,203	0.201	0.530	1	100%	7
Venue affiliation	All nodes and edges	519	35,949	0.267	0.631	2	99.7%	7
Venue affiliation	Original bipartite edge-weight >= 2	454	34,066	0.331	0.652	1	100%	7

[17] A network component represents a subgraph of vertices which are connected to each other by a path of edges. This statistic compares the number of vertices in the largest component to the total number of vertices and gives an indication of a network's ability to cohere the entire field of actors.

[18] Diameter calculates the shortest path between each pair of vertices in a component. The resulting measure reflects the longest of these paths and, therefore, the shortest distance which needs to be travelled to connect most distant actors in a network.

Biographical influences	All nodes and edges	429	766	0.004	0.038	8	96.3%	10
Self-reported similarity	All nodes and edges	405	638	0.004	0.029	2	98.5%	6
Self-reported similarity	Intra-AMC Represented Composers only	164	259	0.010	0.066	2	97.6%	6

Table 2.8 Most prominent actors in curatorial networks, based on degree centrality[19]

CD Affiliation	Degree	Concert Affiliation	Degree	Performer Affiliation	Degree	Venue Affiliation	Degree
Elena Kats-Chernin	124	Elena Kats-Chernin	174	Ross Edwards	438	Elena Kats-Chernin	403
Ross Edwards	112	Ross Edwards	149	Peter Sculthorpe	435	Peter Sculthorpe	397
Peter Sculthorpe	104	Peter Sculthorpe	144	Elena Kats-Chernin	433	Ross Edwards	386
Brenton Broadstock	90	Andrew Ford	115	Andrew Ford	414	Andrew Ford	377
Colin Brumby	88	Anne Boyd	101	Matthew Hindson	398	Paul Stanhope	365

[19] Degree centrality represents the simplest way of measuring vertex prominence, by counting the number of edges connected to each vertex. Directed networks can have separate in-degree and out-degree centrality measures, with the all-degree measure presented here being the sum

2.4.3 Degree distribution

These patterns are also evident in the degree distributions of the different artistic networks. Given each network has a different number of vertices, Figure 2.12 and Figure 2.13 provide a comparison between networks by rescaling each graph's degree distribution to a common range of 1 to 100. The tightly curated concert program and commercial CD networks' distributions follow log-normal distributions. This reflects the predominance of composers who are curated only with a small number of other composers, who are accompanied by a much smaller set of highly-connected composers. The performer and venue networks, by contrast, have much flatter degree distributions, thereby reflecting a representation of the field with far fewer peripheral groupings of composers.

The directional nature of the biographical networks allows for separately considering each of their in- and out-degree distributions. The former represents the number of other composers by whom a composer is influenced and follows a distribution with a moderate positive skew. The latter reflects the number of times a composer influences others, and exhibits the same exaggerated positive skew observed in the concert program and CD degree distributions. While most composers have some influence on others, the field is also marked by a small number of composers who hold significant influence over the artistic practices of others.

Figure 2.12 Degree distribution of curatorial networks

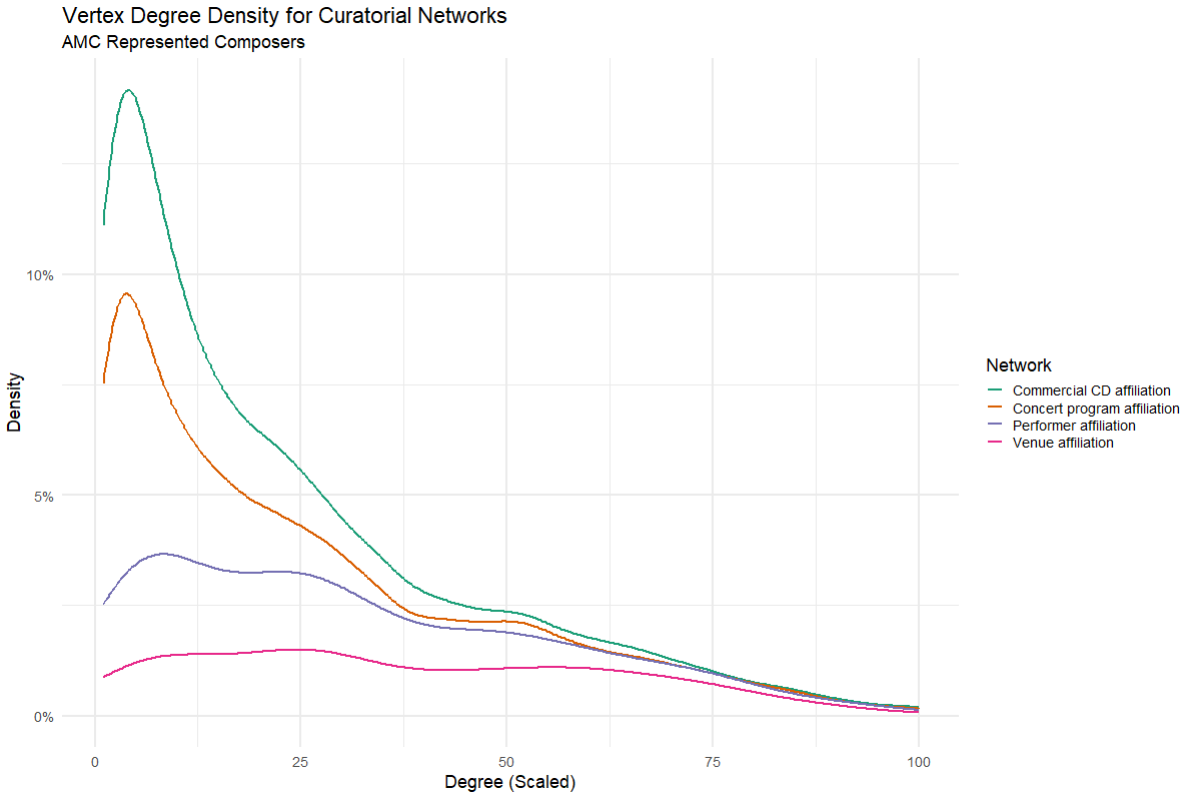
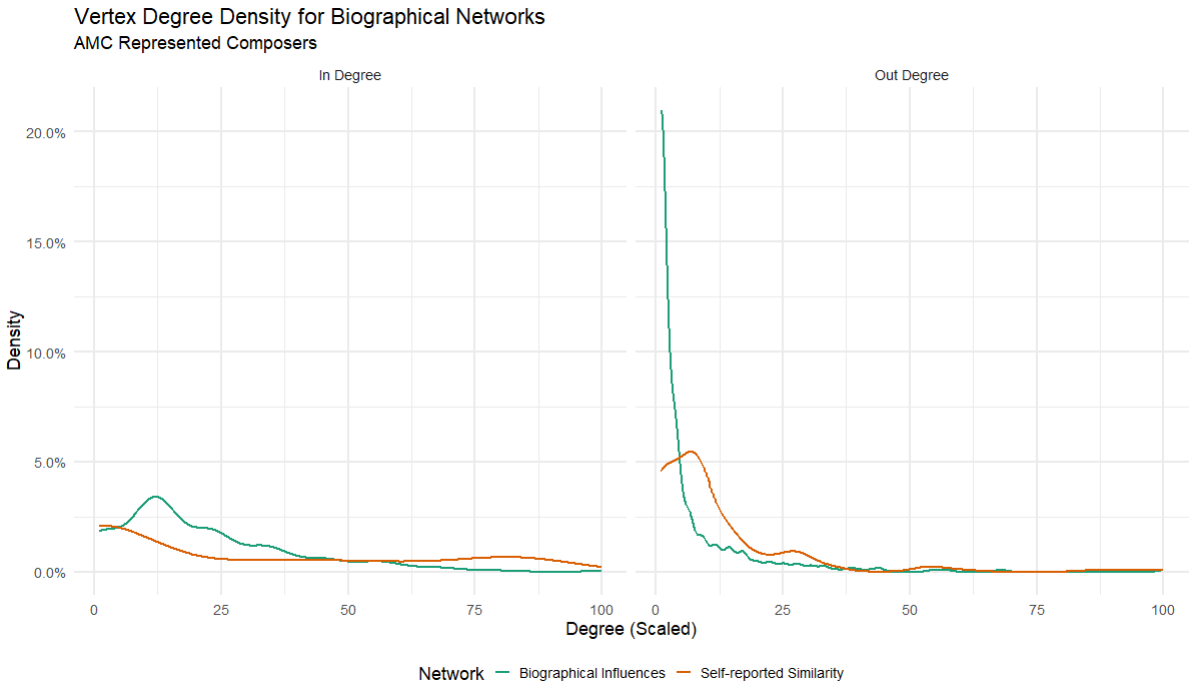


Figure 2.13 Degree distribution of biographical networks



2.4.4 Cohesiveness

In all instances, the artistic networks produce highly connected graphs with a single large component encompassing at least 96% of the network. In part this reflects the

edge-centric (rather than vertex-centric) method by which the networks were produced, which necessarily precludes the existence of 'isolate' nodes which are completely disconnected. Even allowing for this, however, there is a clear paucity of composers who, either curatorially or biographically, operate in networks which are completely separate to the larger field of art music practice. That this characteristic holds true even for networks with a density of just 0.004 suggests that coherence is achieved through a combination of either highly central nodes which bring an otherwise disconnected field together, or a series of locally connected actors which are able to collectively cohere the field.

The degree distributions of the various networks identified above give some insight into this aspect of the structure of fields. The concept of graph centralisation, however, provides a more direct evaluation. Graph centralisation takes a given vertex centrality measure and calculates the ratio of the *actual* sum of differences between the most central vertex and all other vertices, to the *maximum* sum of differences. When considering vertex closeness, for example, a star-shaped network with a single central node has a graph centrality of 1, whereas a ring-shaped network will have a corresponding centrality score of zero. Closeness (the extent to which each vertex is proximate to each other node) and betweenness (the extent to which each vertex sits along the shortest path between each other pair of vertices) graph centrality scores for the various networks are summarised in Table 2.9.

Table 2.9 Curatorial and biographical network centrality measures

Network	**Closeness Centrality**	**Betweenness Centrality**
Commercial CD affiliation	0.351	0.093
Concert program affiliation	0.383	0.109
Performer affiliation	0.557	0.040
Venue affiliation	0.560	0.026
Biographical influences	0.002	0.005
Self-reported similarity	0.001	0.002

While closeness centrality statistics are high for the curatorial networks, the betweenness measures are much lower. This points to structures in which a small number of nodes are significantly more centrally located relative to the rest of the network, however this centrality does not extend to occupying a role of cohering the network together. The biographical networks, by contrast, are both far closer to a ring-type structure in which each vertex is equally significant in achieving the connectivity and coherence observed in the overall network. This suggests that curatorial processes involve a reconfiguration of the flatter network structures which are otherwise found in composer-oriented biographical representations of the field. Whereas composers construct the field as a set of more equally spaced actors, curatorial processes distort this by placing greater emphasis on highly prominent composers. These curatorial tendencies are examined in further detail in Chapter 3, which explores how curation on radio, concerts and digital playlists select from the field of producers to produce different profiles of distance and familiarity for audiences.

2.4.5 Actor prominence

Whereas mapping processes based on dissimilarity matrices only allow the prominence of individual actors to be assessed in terms of their dimensional position, network analysis supports multiple ways by which the prominence of actors in the field can be understood. The simplest measure, for instance, is to consider prominence as being indicated by the degree of each vertex. In the case of the undirected affiliation networks, this is reflected in the number of edges which are connected to an individual composer, with prominence translating to a measure of how likely a composer is to be curated with a broad range of composers. Table 2.1 shows the top five ranking composers from each of the affiliation networks, in which the top three places are consistently held by Elena Kats-Chernin, Peter Sculthorpe and Ross Edwards. Each of these composers is among the most renowned and widely known composers in the field, suggesting curatorial processes which seek to leverage the popularity and name-recognition of these composers.

More broadly, the linear regression in Model 2.1 shows the results of modelling a vertex's degree as a product of both composer year of birth and accumulated artistic

prestige. In applying standard regressions to analyse aspects of network data, it is acknowledged that such techniques are less able to account for inter-dependent endogenous and exogenous network features when compared to techniques such as exponential random graph modelling (ERGM). Whereas this latter approach is used in subsequent analyses which focus on accounting for network structures as a whole (see section 2.4.9 below), the simpler approach taken here permits an analysis of discrete network features. It does so using standard parametric approaches, as opposed to the kinds of permutation tests (Fredrickson & Chen, 2019) which are increasingly available to demonstrate statistical significance in the context of network data.

To account for the variation in degree scores which arise from different network sizes, the model utilises scaled degree scores, with each network's scores adjusted to span a common range of 1 to 100. The model identifies main effects of year of birth and artistic prestige as contributing to actor prominence across the field. This suggests that as composers age and their careers unfold, they move from a narrower sub-field and into increasingly broader curatorial networks of relationships. Whereas commercial earnings did not have a significant effect when modelled, amassing a high level of artistic prestige does predict a higher level of degree-prominence in the field. This suggests that, curatorially, the appeal of symbolic capital is of greater importance than the economic success of composers in drawing composers together.

The interaction effects captured in Model 2.1 also allow consideration of how the main effects vary by the type of curatorial network, with the CD-affiliation network forming the baseline contrast against which the coefficients for other networks are shown. While the effects are fairly small in the case of Year of Birth, the looser curatorial networks of Performer and Venue affiliation show a significantly stronger effect of artistic prestige compared to the CD and Event affiliation networks. Even allowing for the greater density exhibited in the two looser affiliation networks, the model points to performers demonstrating greater propensity to include composers with high levels of symbolic capital in their repertoire.

Model 2.1 Predicting degree centrality in curatorial networks

Term	Coefficient	SE	T-statistic	P-value
Intercept	483.995	79.387	6.097	< 0.001 ***
Year of Birth	-0.241	0.041	-5.941	< 0.001 ***
Network – Event	-382.373	104.636	-3.654	< 0.001 ***
Network – Performer	46.414	104.246	0.445	0.66
Network – Venue	-634.462	105.184	-6.032	< 0.001 ***
Artist Prestige	2.316	0.205	11.282	< 0.001 ***
Year of Birth:Event	0.194	0.053	3.631	< 0.001 ***
Year of Birth:Performer	-0.017	0.053	-0.32	0.75
Year of Birth:Venue	0.335	0.054	6.228	< 0.001 ***
Event:Prestige	0.067	0.281	0.239	0.81
Performer:Prestige	1.478	0.282	5.248	< 0.001 ***
Venue:Prestige	1.441	0.282	5.106	< 0.001 ***

Residual standard error: 15.513 on 1,708 degrees of freedom

Adjusted R-squared: 0.526

Linear regression formula[20]: Scaled Degree ~ Year of Birth + Network + Artistic Prestige + (Year of Birth : Network Type) + (Artistic Prestige : Network Type)

Contrasts: CD Affiliation Network

Note that the dependent variable combines (standardised) data from multiple curatorial networks, hence the use of individual networks as predictors

In addition to degree centrality, network analysis provides a multitude of other ways to consider how we might conceive of the prominence of actors within a field, including the measures of closeness and betweenness centrality discussed above. In considering how we might understand artistic fields, particularly with respect to how

[20] Formulas throughout the thesis are specified in R's formula notation. The dependent variable is placed to the left of the ~ operator, with independent variables listed on the right. Main effects are included by separating them by the + operator, and excluded with the – operator. Specific interaction effects can be specified by combining terms with the : operator. A variable's interactions with all independent variables can be specified with the * operator. The specification of 'Contrasts' in each model refers to the base condition of a categorical variable against which the categories included in the specified model are being compared.

they are able to be constituted as cohesive entities, the idea of prominence as a measure of the network's resilience in the absence of each vertex is of particular interest. Specifically, the idea of 'closeness impact' draws upon work in the risk analysis of networks (Lhomme, 2015) and considers how the removal of a vertex impacts the overall closeness of the rest of the graph. In this regard, a prominent composer is one who is significant in contributing to the overall coherence of the field of Australian contemporary music and whose absence would cause significant detriment.

When ranked by their Closeness Impact scores, Edwards, Sculthorpe and Kats-Chernin again appear as the three most prominent composers. Modelling Closeness Impact as a dependent variable in Model 2.2, however, demonstrates less capacity to explain the variation in the observed data – with an adjusted R^2 of 0.21 compared to the previous model's 0.53. Interaction effects between Network Type and Year of Birth are no longer significant, and instead the Spotify Popularity score of a composer contributes to their increased prominence. This suggests that the capacity for an actor to be influential, when considered in terms of field cohesiveness as opposed to degree centrality, is far less connected to their maturity and symbolic stature in the field. Instead, it supports the notion that prominence can fall to a far more diverse range of actors who are curatorially selected to form bridges between different areas of practice.

Model 2.2 Predicting closeness impact centrality in curatorial networks

Term	Coefficient	SE	T-statistic	P-value
Intercept	45.369	14.099	3.218	0.001 **
Year of Birth	-0.023	0.007	-3.125	0.002 **
Artistic Prestige	0.822	0.082	10.032	< 0.001 ***
Spotify Popularity	0.134	0.018	7.322	< 0.001 ***
Network – Event	0.101	0.476	0.211	0.83
Network – Performer	-0.565	0.475	-1.19	0.23
Network – Venue	-0.608	0.482	-1.262	0.21
Event:Prestige	-0.012	0.112	-0.11	0.91

Performer:Prestige	-0.103	0.112	-0.919	0.36
Venue:Prestige	-0.433	0.112	-3.86	< 0.001 ***

Residual standard error: 6.097 on 1,706 degrees of freedom

Adjusted R-squared: 0.213

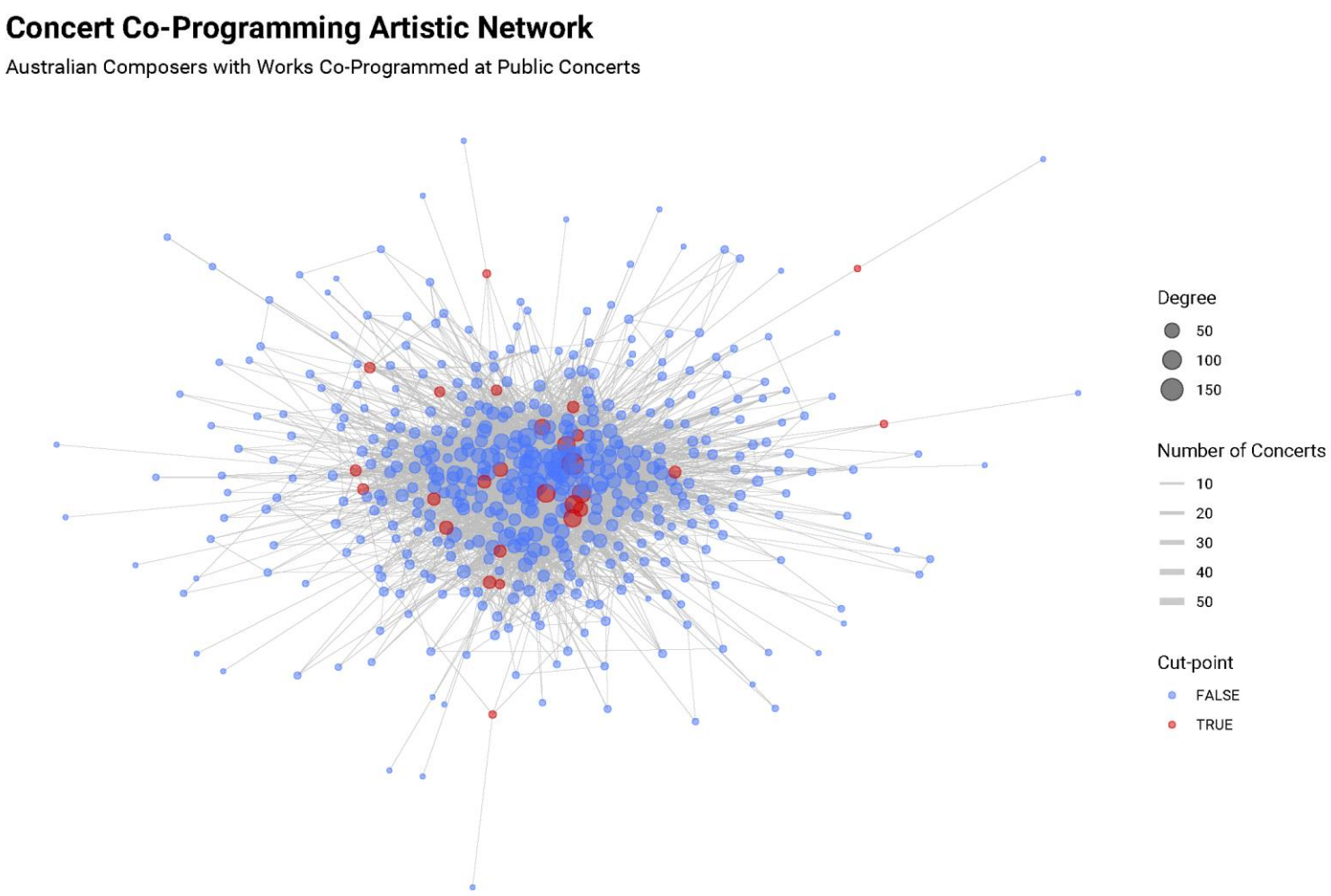
Linear regression formula: Scaled Closeness Impact ~ Year of Birth + Artistic Prestige + Spotify Popularity + Network + (Artistic Prestige : Network Type)

Contrasts: CD Affiliation Network

2.4.6 Cut-point analysis

The notion of selected actors in a field being prominent by virtue of their capacity to ensure the connectivity of the overall network can be further explored by analysing a graph's cut-points. Cut-points are the vertices of a graph which, if removed, would cause the total number of disconnected components in a graph to increase, thereby serving to fracture the network. Whereas closeness impact assessed the importance of individual actors to the proximities of all actors *within* a component, cut-points highlight those actors who are pivotal in bridging otherwise distinct groups of artistic practice.

Figure 2.14 Concert program affiliation curatorial network, showing cut-points



Taking the Concert Program Affiliation network as an example, the network's largest component has 27 composers who act as cut-points. Figure 2.14 provides a visualisation of this network with the cut-point vertices coloured red. Each cut-point extends the network's largest component to include up to three other composers, with 24 of the cut-points only bridging a single composer. Of the cut-point composers who from a bridge to multiple composers, these include prominent composers with a reputation for working across multiple sub-genres, such as Nigel Westlake and Sandy Evans. Overall, however, the data suggest that cut-points in the field of Australian music do not take on sole responsibility for bridging otherwise disconnected sub-fields of artistic practice. Instead, the connections between sub-fields are more distributed and therefore more resilient.

2.4.7 Community detection

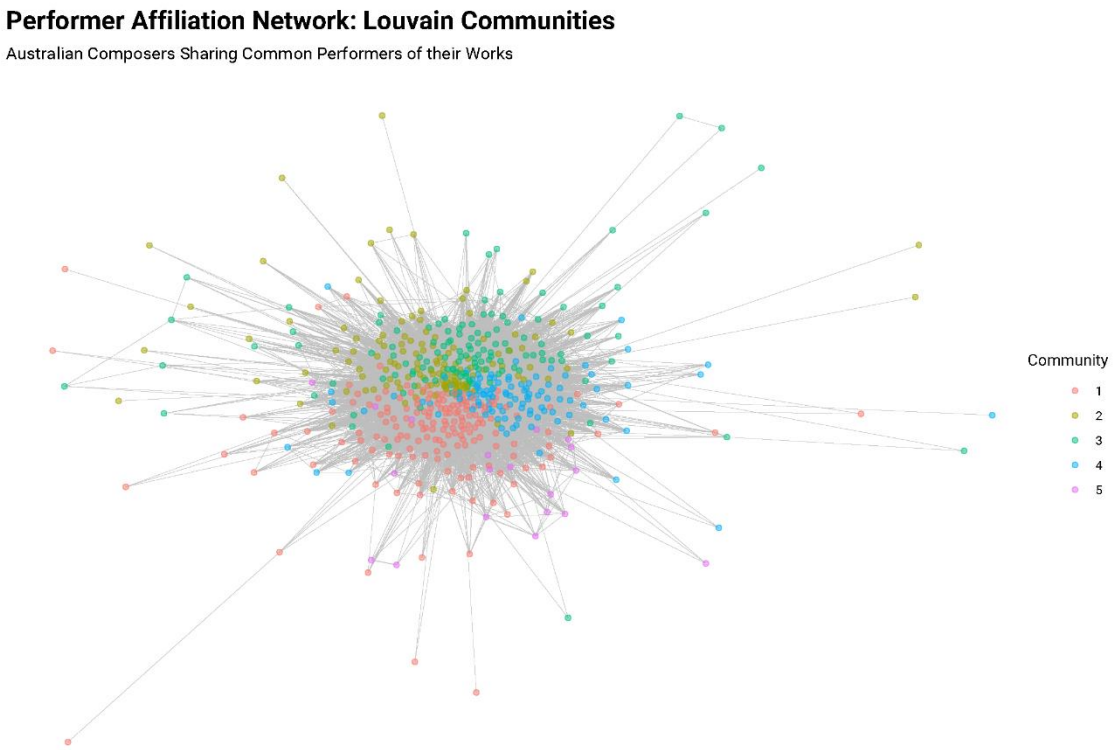
Having established the relationships in a network, community detection techniques can be employed to identify discrete sub-graphs which demonstrate a level of internal cohesiveness with respect to their patterns of network ties. Rather than standard approaches to the clustering of data, such as that employed in the acoustic feature analysis in 2.3.3 above, a range of network-specific approaches to solving this problem has been proposed and implemented in software packages such as `igraph`. Those suited to undirected weighted graphs include modularity optimisation (Fast Greedy and Louvain methods), minimisation of random walks (InfoMap) and the statistical mechanics of a spin glass (Spinglass).

These clustering approaches employ their own optimisation techniques for identifying the number of communities into which networks should be partitioned. Table 2.10 shows the number of communities identified using different detection algorithms for each curatorial network. This suggests that algorithms are generally influenced by the density of the networks they are analysing. The relatively sparse curatorial networks of CD and concert affiliation tend to fracture into smaller communities of practice, whereas the denser of performer and venue affiliation networks – in which ties between actors are more easily formed – provide a perspective of the field which identifies broader levels of associations between actors.

Table 2.10 Number of communities identified in different community-detection algorithms

Network	InfoMap	Spinglass	FastGreedy	Louvain
Commercial CD affiliation	31	8	6	8
Concert program affiliation	28	12	7	9
Performer affiliation	7	6	5	5
Venue affiliation	1	7	4	3

Figure 2.15 Louvain communities in performer affiliation network



The network visualisation above colours each composer vertex in the performer affiliation network based on its cluster assignment resulting from the Louvain clustering algorithm. The spatial position of nodes is implemented using the force-directed Fruchterman-Reingold algorithm. This aims to provide an aesthetically pleasing layout, as opposed to the MDS approach of locating nodes in a dimensional space.

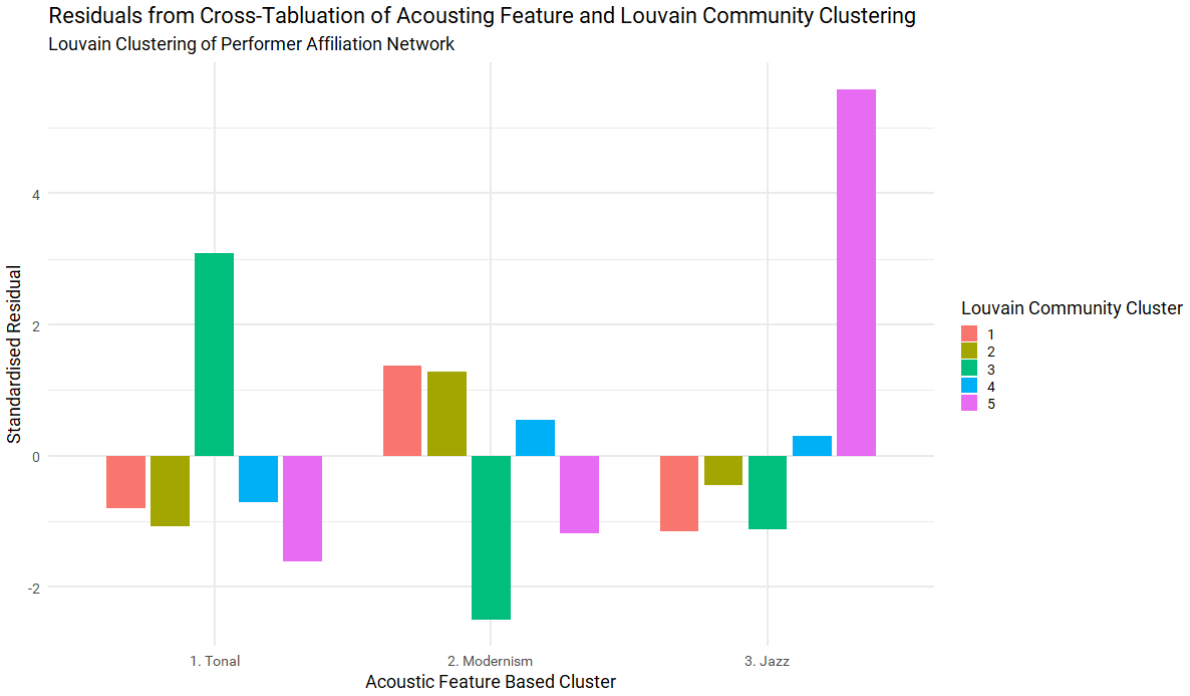
The extent to which these curatorial network-based communities can be regarded as corresponding with the clusters which emerged from acoustic feature analysis can be

examined by way of the residuals which arise from a cross-tabulation between the two approaches. Taking the performer-affiliation network as an example, the Louvain community detection technique achieves the highest standardised residuals[21] for the correlation between audio cluster membership and network community membership. Louvain is an implementation of an objective function optimisation technique based on increasing the modularity of communities (Blondel, Guillaume, Lambiotte, & Lefebvre, 2008); modularity is taken to reflect the density of links inside communities relative to links between communities. Figure 2.15 provides a visual representation of this network clustering, and the cross-tabulation residuals shown in Figure 2.16 demonstrate that, particularly in the case of the 'tonal' (acoustic cluster 1) and 'jazz' (acoustic cluster 3) groups, they are each significantly positively correlated with membership of a particular curatorial network of composer. The residuals for the more diverse European-influenced music (acoustic cluster 2), however, do not display any strong association with any particular networked groupings. Instead, the strongest residual is a negative one, in which curatorial network 3 is most over-represented in audio cluster 1 and most under-represented in audio cluster 2.

In addition to identifying a degree of overlap between acoustic representations of a field and their curatorial structure, these findings also point to relational ways of understanding art music practice. Rather than just evidence of positive correlations between particular acoustic and curatorial groupings, the third curatorial network community can be seen as significantly oppositional to the sound world of acoustic cluster 2. Participation in that curatorial community involves largely rejecting an association with particular stylistic approaches in contemporary composition. The strength of this antagonism between tonal and modernist stylistic approaches – which is reproduced in acoustic and curatorial representations of the field – echoes the significance of the 'style wars' debates which were identified in the chapter's introduction for structuring positions in the Australian art music field.

[21] Standardised residuals are a measure of how strongly observed counts in a cross-tabulation of categorical variables vary from expected counts. They are calculated as the difference between observed and expected counts, divided by the square root of the expected count.

Figure 2.16 Comparing acoustic and network-based community detection



2.4.8 Correspondence with composer perspective

The extent to which different curatorial networks' representations of the field correspond with the distances derived from the survey of composer similarity rankings can further our understanding of the relationship between these two different approaches to constructing the field. The dissimilarity matrices of distances between composers used in this assessment can be derived from networks by considering the length of the shortest path which connects each pair of vertices. In the case of networks with weighted edges, these weightings can also be incorporated to provide a more fine-grained representation of distance[22].

The performance of each of the curatorial networks in reproducing the composer survey rankings, using the same ordinal and distance-based scoring methods applied to acoustic models in 2.3.2 above, is shown in Table 2.11. Lower scores indicate improved goodness of fit and an increased capacity to reproduce the rankings

[22] As the affiliation networks all use edge weights as an indication of relationship *strength*, reciprocal edge weights were used in calculating network distances.

observed in the composer survey. For ordinal scores, a score of 8 would be expected from a random matrix of composer distances.

Table 2.11 Curatorial networks' similarity to composer ranking distances

Curatorial Network	Ordinal Score	Distance Score
CD Affiliation	7.50	196.88
Event Affiliation	7.00	218.00
Performer Affiliation	6.00	149.63
Venue Affiliation	6.13	166.25

Somewhat surprisingly, the denser, and thereby less discriminatory curatorial networks, bear closer resemblance to the composer rankings, with the performer affiliation network achieving the best scores. This suggests that the curatorial choices by performers in selecting which repertoire they perform are relatively harmonised with an understanding of the field shared by composers. Conversely, the curatorial decisions which formulate discrete concert programs and recordings produce quite different representations of the field. The ordinal score of 7.5 for the CD-affiliation network, for instance, is only marginally better in reproducing the composer perspective than a random arrangement of composers. This suggests that there is a different set of considerations which informs the selection of concert and CD programs compared to how composers regard distance and similarity in the field. This introduces an interesting gap between the perspective of producers and how the field is mediated to audiences. Whereas performers share a similar alignment to composers in reproducing clusters of artistic similarity, curators reshape this constellation of producers in presenting their work to audiences. This can also be interpreted as reflecting the varying social distance implicit in these forms of curation. Not only are performers frequently also composers themselves, but they tend to form closer relationships with contemporary composers through commissioning and championing their works. By contrast, the more distinct curatorial professions – such as artistic programmers and working for CD labels – are placed at a greater distance from the space of composers and, as such, are also driven by the pursuit of more distinct and separate agendas.

2.4.9 Modelling curatorial networks

In addition to being able to draw upon descriptive statistical network analysis techniques to interrogate and increase our understanding of artistic fields, a range of inferential techniques can also be applied to further elucidate the characteristics of particular networks. The specification of an exponential random graph (ERGM) involves selecting a set of network statistics which are presumed to produce the structure of the network; in a manner similar to a standard regression, the contribution of each network statistic is then indicated by a respective parameter weighting. While causal inference would require modelling additional processes, such as the temporal dynamics of tie formation and random actor attributes (Krivitsky & Morris, 2017), the ERGM family of models nevertheless provides a widespread, flexible and powerful approach for modelling networks (Luke, 2015, p. 163). Unlike a logistic regression, however, ERGMs do not assume the independence of the tie formations it is modelling (i.e. the presence of a network relationship between a pair of actors) and instead consider their conditional probability given the structure of other parts of the network (Koskinen & Daraganova, 2013). While work has been done to consider issues relevant to extending ERGMs to valued networks (e.g. Krivitsky, 2012), the current analysis is limited to approaches which model the binary presence or absence of network ties.

The network statistics available to include in ERGMs are considerably varied, with the most common candidates involving attributes of individual vertices (commonly referred to as 'main effects') or dyadic covariates (which aim to capture hypothesised social relationships such as homophily or heterophily[23]), together with endogenous effects reflecting processes of network self-organisation. Regardless of the hypothesised relationships being examined, Robins and Daraganova (2013) recommend incorporating both endogenous (e.g. relating to degree distribution) and exogenous (e.g. gender) statistics in the fitting of models to network data to ensure that both sources of variation are controlled for when making inferences. The

[23] As the opposite of the previously defined concept of homophily, heterophily is a pattern in which relationships between actors is more likely when they do not share a common characteristic.

subsequent technical modelling of networks was conducted using R's `ergm` library (Handcock et al., 2019).

Taking the event affiliation network as an example, it is firstly necessary to consider the implications of applying a binary modelling method to a network which includes valued edge weights. The approach taken has been to introduce a threshold for the strength of the curatorial affiliation between composers by deriving an edge-induced subgraph with a minimum edge weight of two. This produces a subgraph including only those vertices and edges between composers who have been co-featured in at least two separate concert programs, resulting in a network of 328 vertices and 1,803 edges. The subsequent approach to model fitting, as summarised in Model 2.3, is to firstly develop a baseline model (Model I) which is effectively limited to representing the density of the network. The parameter estimations are expressed as logits and are interpreted in terms of changes to the logarithm of the odds of an edge being formed between a given dyad conditional on all other parameters; the edges coefficient of -3.382 for Model I, therefore, translates to a probability of 0.033[24].

Following the approaches of Harris (2014) and Hunter, Goodreau, and Handcock (2008), model specification proceeded by incorporating both vertex main effects (i.e. attributes of the individual vertices involved in a potential tie formation) and dyad interaction effects in Model II, with a view to identifying network statistics which both minimise the model's Akaike information criterion (AIC) and improve goodness-of-fit measures. Finally, Model III then incorporates endogenous network structure into the model by way of the geometrically weighted edge-wise (GWESP) and dyad-wise (GWDSP) shared partners statistics proposed by Hunter (2007) for capturing transitive and non-transitive clustering. Again, AIC and goodness-of-fit were used to determine the appropriate weightings of the geometric scaling (λ) in each of these statistics by beginning with low values which were progressively increased.

[24] Logits are transformed to odds by taking the exponent of a given logit; odds can be transformed into a probability by the formula $p = \frac{odds}{odds + 1}$

Model 2.3 Event affiliation ERGM model specification

Parameter	Estimate (S.E.)		
	Model I (AIC 15,780)	Model II (AIC 13,290)	Model III (AIC 11,349)
Edges	−3.382 (0.0245) ***	8.839 (4.266) *	−4.727 (0.293) ***
GWESP, $\lambda = \log(2)$			1.77 (0.002) ***
GWDSP, $\lambda = \log(1.7)$			−0.006 (0.002) **
Year of Birth, main effect		−0.003 (0.001) **	−0.001 (< 0.001) ***
Year of Birth, difference		−0.019 (0.002) ***	−0.007 (0.001) ***
Gender – Female, homophily		0.652 (0.078) ***	0.443 (0.005) ***
Gender – Male, homophily		−0.015 (0.055)	0.139 (0.003) ***
State, homophily		0.696 (0.052) ***	0.405 (0.003) ***
Artistic Prestige, main effect		0.111 (0.005) ***	0.047 (0.003) ***
Artistic Prestige, difference		−0.053 (0.006) ***	−0.037 (0.005) ***
log(Commercial Earnings), main effect		0.055 (0.006) ***	0.011 (0.003) ***
Number of Compositions, main effect		0.003 (< 0.001) ***	0.001 (< 0.001) ***

$*\ 0.005 \leq p < 0.05$

$**\ 0.0005 \leq p < 0.005$

$***\ p < 0.0005$

The successive improvement in the quality of the three models can be seen in the correspondingly diminishing AIC values of 15,780 (Model I), 13,290 (Model II) and 11,349 (Model III). A similar improvement in the goodness-of-fit measures can also

be observed, particularly in terms of each model's simulated networks being able to reflect the degree distribution and edge-wise shared partner characteristics of the observed event affiliation network. A notable exception to this, however, is in Model III's tendency to produce more isolate nodes compared to both Model II's simulations and the observed network. Attempts to control for this in the modelling process were unsuccessful, as the resulting models failed to converge.

The interpretation of these models points to the continuous nodal covariates of age (as the inverse of year of birth), artistic prestige, commercial earnings and number of compositions as all positively contributing to the formation of ties with other vertices in the network. Homophily can also be observed in the categorical dyadic parameters of composers either sharing the same state or the same gender, and in the negative coefficient for the difference between two vertices' years of birth[25]. The strength of these effects can be interpreted by taking the exponent of the parameter coefficient as reflecting the percentage change in the log-likelihood of a tie occurring for a unit change in the corresponding parameter (all other parameters being equal). The strength of the categorical homophily effects in Model III can be shown to range from a 15% increase in the log-odds of a tie in the case of both composers being male, through to 50% when composers are from the same state, and 56% when both composers are female. Considering the year of birth parameter, the main effect is shown to be relatively small in size, whereas the homophily effect is much more pronounced: two otherwise identical composers who are both born in the same year have a 32% increase in the log-likelihood of them sharing a tie than if the composers were born 40 years apart.

The interpretation of the structural GWESP and GWDSP parameters is a more complicated process, with the positive coefficient for GWESP broadly reflecting the presence of transitivity in the network at a level beyond that explained by the model's exogenous factors. Hunter (2007) specifies the log-probability for a connected dyad

[25] For continuous variables, the operation of homophily can be investigated through a network statistic which calculates the absolute difference between the variable for each dyad. A negative parameter coefficient, therefore, is interpreted as demonstrating that the further apart the two vertices are with respect to that variable, the less likely they will form a tie and, conversely, that vertices sharing similar values are more likely to be connected.

to complete a triangle as being given by the formula $\theta \cdot (1 - \exp(\lambda))^k$, where θ is the GWESP parameter coefficient, λ is the fixed geometric weighting applied to the decay and k is the number of triangles which the dyad is already a part of. The corresponding negative coefficient for GWDSP indicates a tendency for two-path effects to be 'closed' and form triangles (Robins & Lusher, 2013, p. 175). If a pair of composers is curatorially connected, there is increased likelihood that each will also be connected to the local cluster of other composers to which the original pair is individually connected.

As the `ergm` package is unable to estimate models involving parameters with missing values, the preceding models were unable to consider the extent to which the auditory similarity of composers (in terms of the audio clusters identified in 2.3.3 above) might be involved in the formation of curatorial networks[26]. There is no ideal statistical resolution to this problem (Butts, 2013), however the approach taken in this analysis was to produce a vertex-induced subgraph which only includes composers who have been assigned to an audio cluster. This resulted in a network of 137 vertices and 778 edges, with a density of 0.08. The baseline model (Model I, AIC: 5,354), together with optimised exogenous (Model II, AIC: 4,291) and combined (Model III, AIC: 3,858) models, are specified in Model 2.4 below.

[26] Missing values arise due to only composers with at least 14 recordings in the AMC recorded music collection being able to be included in the audio cluster analysis due to the multivariate statistical techniques employed.

Model 2.4 Event affiliation ERGM (acoustic cluster subgraph) model specification

Parameter	Estimate (S.E.)		
	Model I (AIC 5,354)	Model II (AIC 4,291)	Model III (AIC 3,858)
Edges	−2.396 (0.037) ***	26.216 (6.7) ***	6.439 (0.282) ***
GWESP, $\lambda = \log(2.5)$			1.224 (0.002) ***
GWDSP, $\lambda = \log(2.5)$			−0.003 (0.005)
Year of Birth, main effect		−0.008 (0.002) ***	−0.003 (< 0.001) ***
Year of Birth, difference		−0.012 (0.003) ***	−0.006 (0.002) ***
Gender – Female, homophily		0.602 (0.141) ***	0.446 (0.006) ***
Gender – Male, homophily		−0.01 (0.089)	0.13 (0.004) ***
State, homophily		0.525 (0.085) ***	0.342 (0.003) ***
Artistic Prestige, main effect		0.122 (0.007) ***	0.044 (0.004) ***
Artistic Prestige, difference		−0.051 (0.009) ***	−0.031 (0.007) ***
log(Commercial Earnings), main effect		0.048 (0.012) ***	0.009 (0.007)
Number of Compositions, main effect		0.002 (< 0.001) ***	0.001 (< 0.001) ***
Spotify Popularity, main effect		0.012 (0.003) ***	0.006 (0.002) **
Audio Cluster 1, homophily		0.664 (0.107) ***	0.445 (0.004) ***
Audio Cluster 2, homophily		0.158 (0.111)	0.289 (0.004) ***
Audio Cluster 3, homophily		1.399 (1.095)	1.298 (0.039) ***
Audio Cluster 3, main effect		−1.323 (0.206) ***	−0.364 (0.007) ***

$*\ 0.005 \leq p < 0.05$

$**\ 0.0005 \leq p < 0.005$

$***\ p < 0.0005$

Significant homophily effects are shown for all three audio clusters in Model III, with the increased log-odds of tie formation ranging from 33% (cluster 2, European/modernist-influenced), to 56% (cluster 1, traditional-tonal) and 266% (cluster 3, jazz idioms). Cluster 3 also shows a significant negative main effect, indicating that composers working in this style are, generally, less likely to be connected in curatorial relationships but, where they are, they are far more likely to form connections with other cluster 3 composers.

Overall, the application of statistical modelling of networks offers additional insights into the forces which shape the relations which are formed in particular curatorial networks. In analysing the curatorial network of concert program affiliations, it is interesting to observe that strong homophily effects are observed. Whereas homophily is typically theorised in terms of *direct* social relations (McPherson et al., 2001), this analysis shows similar effects in the mediated social relations which arise from curatorial affiliation. The geographic homophily effect of the state in which a composer resides emphasises the importance of art music as a situated practice, suggesting that local networks of relations retain significance despite the increasing rhetoric around the 'global composer'. The strength of female gender homophily is also interesting in that it suggests that the gender imbalance prevalent in art music (Macarthur, 2006), together with the numerous initiatives being undertaken to address the issue, takes place in a context of concert programming decisions which are more likely to favour female composers being co-featured together. The gender imbalance is therefore not just manifested as an issue of under-representation (only 27% of AMC represented composers are female), but also goes to an imbalance in how women are more likely to be heard alongside other women.

The range in the strength of homophily effects for each audio cluster also points to the differential ways in which similarity in the acoustic sounds of composers draws composers into curatorial networks. While the jazz-influenced idiom represented by cluster 3 leads to particularly strong intra-cluster tie formations, suggesting an acoustic cohesiveness to that sub-field's curatorial processes, the associations are far weaker in the other two clusters. This pattern points to the different ways in which sub-genres are accommodated within the field. As the Australian art music

community grapples with issues of its identity and diversity of practices – as discussed in the thesis introduction – the potential for its ambit to include additional sub-fields analogous to jazz brings the question of what coheres the field as a whole into starker contrast. While clusters 1 and 2 also exhibit statistically significant homophily effects, their much weaker nature reflects curatorial processes among the more established traditions of art music being less rigid in the types of sound worlds which are brought together.

Considering the continuous composer covariates included in the model, the size of their main effects on the formation of relationships is relatively small. Being born earlier, having composed a larger number of works, and increased commercial earnings all only moderately contribute to increasing the likelihood that composers exhibit a curatorial affiliation. Instead, it is the homophily effects which are more pronounced, whereby composers with similar amounts of experience (as measured by year of birth) and level of artistic prestige are more likely to have a relationship. This suggests that curatorial representations of the field bring together composers who are at a similar stage of the development of their careers.

2.4.10 Mapping curatorial networks

The final approach to considering how artistic network analysis can inform our understanding of the field of art music practice is through the application of the multi-dimensional scaling techniques used in mapping the analysis of acoustic features (see Section 2.3.4). While the network visualisation techniques implemented in packages such as `igraph` include techniques which draw upon multi-dimensional scaling (e.g. Kamada & Kawai, 1989; Fruchterman & Reingold, 1991), their aims are ultimately to provide 'pleasing' layouts rather than ones based on providing a statistically optimised representation of the distances between vertices.

The dissimilarity matrices derived from each of the event, CD, performer and venue affiliation networks were used as the input set of distances which were scaled using the same approach as in Section 2.3.4 above. The overall performance of the MDS scaling for the curatorial networks, in terms of goodness-of-fit, was considerably poorer than that achieved in the scaling of acoustic-based distances. Table 2.12 shows

the stress scores, which demonstrate that even when a third dimension is added, the fitted distances require substantial deviation from their observed proximities.

Table 2.12 Stress results for 2 and 3-dimensional scaling of curatorial network dissimilarity matrices

Network	2-dimension stress	3-dimension stress
Commercial CD affiliation	52.76	43.47
Concert program affiliation	29.46	22.91
Performer affiliation	23.53	19.85
Venue affiliation	24.29	20.31

The relatively poor performance of multi-dimensional scaling for these networks can, in part, be attributed to the larger number of composers encompassed by each network. Their resulting visualisations, however, also point to aspects of how curatorial perspectives effectively conceive of distances in the field of Australian art music. As shown in Figure 2.17, there is far greater centralised clustering of points in these maps and a much narrower range of values on each axis able to represent the space in which each composer is mapped. The way in which each of the curatorial networks was constructed, particularly with respect to how the intensity of relationships between composers was calculated, can be seen to produce a mapping of the field which avoids the sorts of extreme oppositions found in the acoustic mapping based on a composer-centric conceptualisation of the field.

Not only does this point to a gap between how producers and curators view the field, but it suggests that curatorial practices may play a significant role in cohering the field by downplaying the distances which producers might otherwise regard as distinguishing their music. Whereas the MDS dimensions which were produced from acoustic analysis lent themselves to interpretation as organising principles of the field, no such corresponding clarity emerges from the highly clustered dimensions which arise from scaling the curatorial distances. This is clearly brought into relief in Figure 2.18, which takes the first two dimensions of the Event Affiliation network and plots the same 42 sample composers included in the acoustic MDS analysis (see Section 2.3.4). The absence of any clear structuring dimensions is partly attributable to both the increased stress scores in curatorial MDS maps and its sensitivity to outliers

resulting from the simple weightings applied in network edge construction. It also suggests, however, that a curation perspective produces far more 'pragmatic' configurations of the field in which the nuances of stylistic concerns are not reflected. Indeed, given Menger's (2017) observation of audience members' inability to distinguish between the different styles of contemporary art music, it would be unsurprising to learn that composition style does not feature in how they conceive of how the field is structured. These issues are explored further in Chapters 4 and 5, which consider the processes, modes of appreciation and acoustic features which are salient as audiences form an attachment to contemporary art music.

Figure 2.17 3-dimensional scaling of curatorial networks (dimensions 1 and 2)

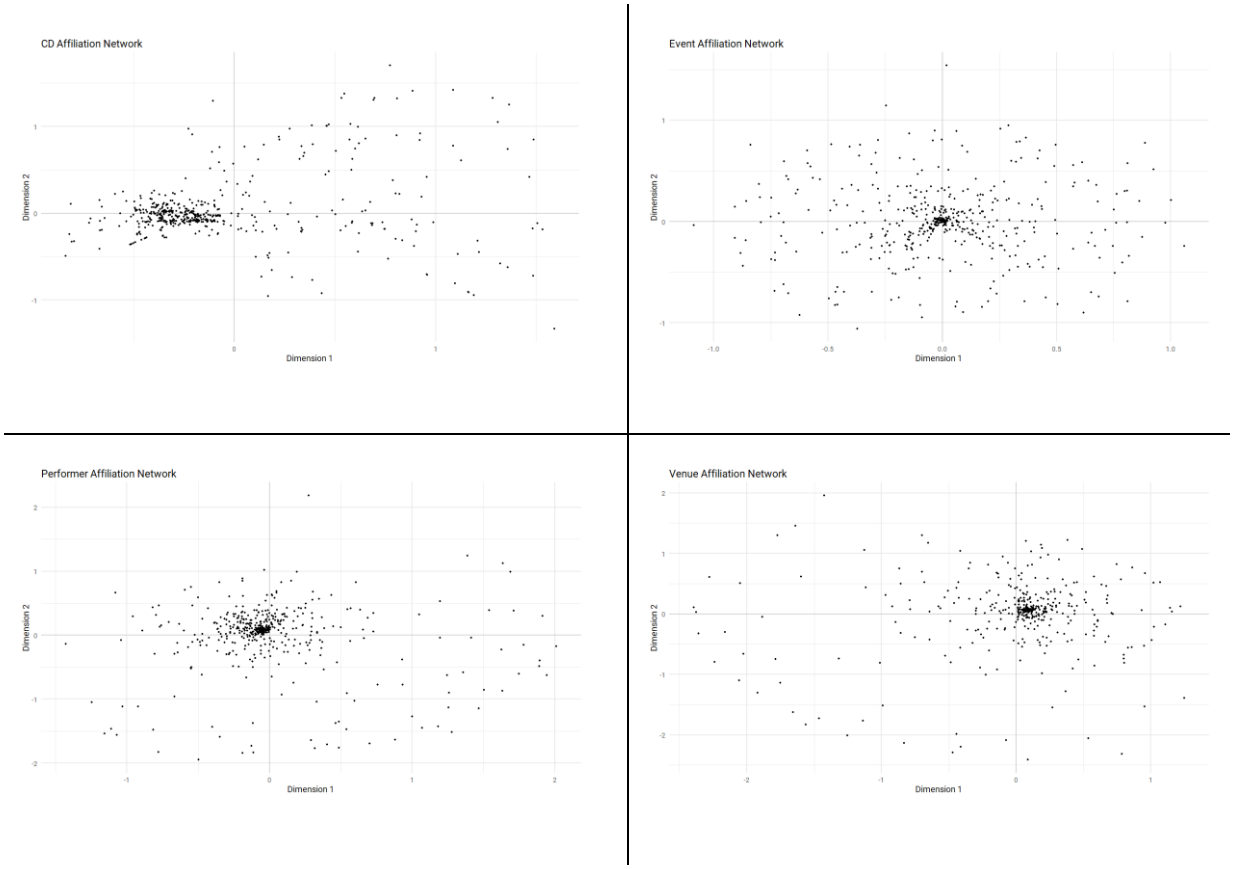
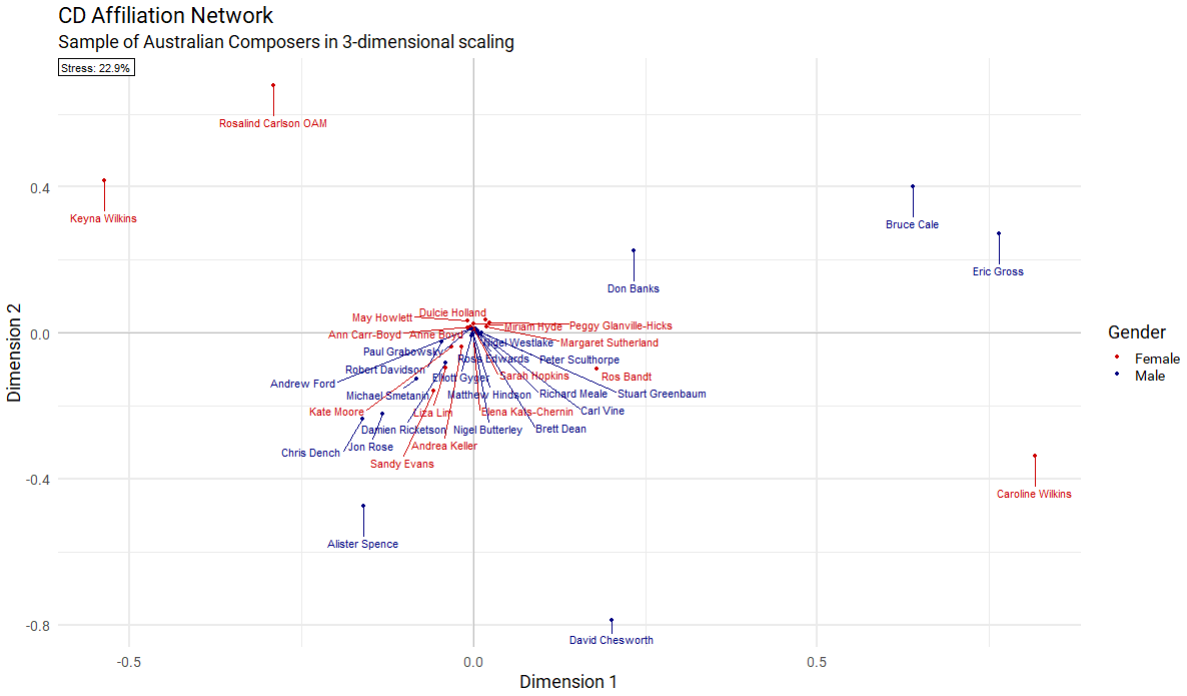


Figure 2.18 Sample of 42 Australian composers in 3-dimensional scaling of the CD affiliation network



2.4.11 Summary

The application of network analysis techniques to curatorial and biographical data offers a multitude of opportunities for investigating how the space of Australian art music producers is perceived from these perspectives. As different curatorial practices variously assemble composers together, it is composers with substantial public profiles who are given the role of cohering the field of Australian art music. Instead of a case of cross-art form artists being selected by curators to bridge different communities of practice, there is much greater reliance on increased age, artistic prestige and external measures of popularity. In doing so it suggests that curators are more concerned with ensuring the familiarity of music presented, as opposed to programming a journey which introduces audiences to more unfamiliar musical styles. Just as commercially successful composers tended towards the centre of acoustic dimensional space (see Section 2.3.4), curatorial processes emphasise this further.

When compared to acoustic based models, however, the curatorial networks show less capacity to reproduce the distances between Australian art music composers as perceived by the composers themselves. Indeed, the more tightly curated networks (commercial CD releases and concert programs) performed substantially worse than

the looser networks of performer and venue affiliation. This suggests that the commercial concerns of the former introduce greater gaps in how they present the field of producers. More generally, it suggests that actors that are more intimately connected to the perspective of producers emphasise distance as a means of distinguishing the distinctiveness of their practice. By contrast, more commercially oriented curators will pull the field towards the familiar. A hypothesis for further investigation would be that these commercial concerns reflect the curatorial use of composers with high name-recognition and popularity over and above stylistic affinity. Such an explanation is reinforced by the MDS projections, which show the distances between composers are compressed in the curatorial networks and the stylistic demarcations which organised the field in acoustic space dissipate. To the extent that network modelling demonstrates a level of homophily between stylistic clusters, however, curatorial processes follow acoustic modelling by showing this to be strongest in the sub-field of jazz.

2.5 Social network analysis

Having reviewed composer, acoustic and curatorial representations of similarity, the final contrast examines how the space of Australian art music composers is understood through the prism of the social interactions of audiences. This perspective supports a conceptualisation of fields as ones constituted by these interactions – both *between* producers as they form communities of practice and as interactions among the broader set of actors who consume and engage with Australian art music. As discussed in 2.1.1 above, however, an analysis of social interactions encounters the methodological challenge of amassing a suitably comprehensive set of data to support investigating how these relationships locate composers in the broader field of producers.

The approach taken in this analysis is to examine social media platforms as a particular manifestation of social interactions. These platforms include substantial numbers of active users and represent significant spaces in which the domain of Australian art music is engaged with by diverse audiences. Rather than social media relationships being a proxy for the nuanced and qualitatively diverse relationships which exist among art world participants, however, the analysis seeks to consider

how the field is constructed from the perspective of the networks which take shape on particular social media platforms. The publicly observable interactions which are supported by these platforms include the varying intensity of interactions between participants (e.g. how frequently users mention each other) and publicly identifiable acts of association (by 'following' other users), whereby a user's profile shows the other members of the platform they are connected to as 'following' and, inversely, who is following them. In the realm of social media platforms, the acts of network formation can be viewed as symbolic acts of affiliation by which actors, such as composers, are able to publicly position themselves and articulate their position in the field through their assembled network. As networks expand to include relationships between broader sets of actors, the relative location of different composers in these networks can reflect how the field is understood from the perspective of consumers on different platforms.

Focussing on Twitter and SoundCloud in particular, and seeding the analysis with the accounts of AMC-represented composers who are active on each of these platforms, the analysis in this section firstly considers the topographical characteristics of these networks. They are not only substantially larger than the previously examined artistic networks, but remain relatively small in network diameter – reflecting the low-cost of follower 'interactions' on social media and introducing challenges for producing suitably discriminatory distances between composers. Instead of age and artistic prestige, which were both observed as coinciding with actor prominence in artistic networks, social media platforms present a very different picture of centrality and influence. Early and mid-career composers dominate, while traditional markers of symbolic reputation are not associated with increased prominence among social media audiences. While a number of older and more established composers are present on Twitter and SoundCloud, this finding is also unavoidably influenced by the younger demographic which is active on these platforms. While Facebook's demographic is relatively consistent across age ranges, Twitter shows substantial declines for users above the age of 50 (Yellow, 2018, p. 14). The opportunistic selection of platforms – which emerged as a result of Facebook's response to the Cambridge Analytica scandal – presents an obvious limitation to the coverage of the analysis undertaken.

The analysis concludes by contrasting how social media networks are able to map the space of Australian art music. As standard approaches to deriving distances in unweighted social networks lack discriminatory power, this analysis necessitated the development a novel approach to representing distances based on the concept of 'shared neighbourhoods'. This approach involves generating a weighted network based on the overlap in followers between different actors. Instead of the stylistic and commercial considerations which were previously observed in the composer/acoustic and curatorial representations of Australian art music, social network analysis demonstrates more eclectic framings of the field which can also juxtapose composers based on demographic and more ideological considerations.

2.5.1 Methodology

2.5.1.1 Platform selection and data collection

The selection of social media platforms for analysis was based on both prevalence of usage among AMC represented composers, together with considerations of programmatic accessibility to interrogate the data. A preliminary audit of the social media presences of 274 AMC represented composers, for instance, demonstrated that Facebook was the social media platform where most composers had an active presence (n = 166; 60.58%), followed by Twitter (n = 130; 47.45%), SoundCloud (n = 87; 31.75%) and YouTube (n = 68; 24.81%). The resulting intention to analyse the Facebook platform, however, was prevented by the service's response to the Cambridge Analytica scandal which led to considerable tightening of the functionality and data available through their Graph API and other interfaces (Archibong, 2018).

As a result, both Twitter and SoundCloud were selected for analysis. Whereas Twitter represents a globally popular platform with 321 million monthly users[27] and is suited to textual interactions, SoundCloud (76 million monthly users as of March 2019[28]) is a more specialist community based around sharing the music of its creator members. Both platforms allow users to elect to 'follow' the content posted by other user accounts in an asymmetric manner, with the resulting lists of whom each user is

[27] https://www.washingtonpost.com/technology/2019/02/07/twitter-reveals-its-daily-active-user-numbers-first-time/?noredirect=on&utm_term=.68d953ca3371

[28] https://expandedramblings.com/index.php/soundcloud-statistics/

following (‘friends’), and which users are following them (‘followers’), made publicly available on user profiles. While SoundCloud represents communities formed around the artistic output of creators, the social media presence of actors on Twitter is less homogeneous. The activity of a user on Twitter is able to represent potentially multiple contexts of engagement, such as the personal, the political and the professional.

The collection of social media data was completed in June 2018, with the aim of obtaining a complete representation of second-order networks, based on an initial first-order set of AMC represented composer accounts. The second-order network represents all of the accounts either being followed by or which are following composers represented in the first-order network. The final networks obtained are then able to represent all the relationships (i) within the first-order set of user accounts; (ii) between the first and second-order accounts; and (iii) within the second-order set of accounts. Moving beyond the second-order relationships is computationally prohibitive and offers only marginal opportunities for analytical gain. The set of third-order Twitter accounts, for instance, quickly expands to encompass 58,876,477 unique accounts, which reflects over 18% of the total number of active monthly users on the platform. SoundCloud exhibits a similar exponential increase, with the third-order set comprising 12,658,420 users and over 16% of active monthly users.

The publicly available APIs of each of Twitter and SoundCloud were utilised to obtain the network data. A limitation of this approach is that Twitter, in particular, places restrictions on the amount of data which can be retrieved on friends and followers of individual accounts. As a result, this data was only able to be captured where the number of friends or followers was less than 100,000 accounts. All first-order accounts were under this threshold, however the complete networks of 2,692 Twitter accounts and 3 SoundCloud accounts were unable to be captured. The impact of this limitation is considered negligible for the current analysis, given its effect is essentially restricted to not being able to capture the friend and follower relationships *between* highly influential users (such as Barack Obama and Ellen DeGeneres).

2.5.1.2 Twitter mentions network

In addition to the binary directed data on friend/follower relationships between social media accounts, an additional set of weighted edges was created for the Twitter network by taking advantage of access to the discrete public tweets posted by each AMC represented composer. A total of 193,588 individual tweets, including 156,341 hashtags and 127,731 mentions of other Twitter users, were harvested. A directed edge was then constructed for each instance of a composer mentioning another first-order account, weighted by the number of mentions.

The user accounts identified in the above processes of data collection were appended as vertices to the multigraph prepared as part of the artistic network analysis discussed in 2.4.1 above, with each of the three new networks – SoundCloud friends/followers, Twitter friends/followers and Twitter user mentions – added as a new set of edges. The extent of each of these networks is shown in Table 2.13 below.

Table 2.13 Vertices and edges in social networks

Network	Network Type	Vertices	Edges
SoundCloud Friends/Followers	Unweighted, directed	20,742	748,750
Twitter Friends/Followers	Unweighted, directed	66,896	10,989,149
Twitter User Mentions	Weighted, directed	88	378

2.5.2 Network characteristics

The broader networks of actors which are captured in social media networks ensure that each of the SoundCloud and Twitter friend/follower networks are substantially larger than those found in the curatorial and biographical networks above. Rather than only considering relationships between composers in the field of contemporary Australian art music, the networks have the capacity to draw in diverse audiences and consumers who are in friend and follower relationships with those composers and with each other. The network summary statistics in Table 2.13 above, for example, identify a Twitter network involving almost 70,000 actors who are connected by just under 11 million friend and follower relationships.

The considerable number of vertices in these networks ensures that their densities are, unsurprisingly, much lower than the artistic networks previously examined. The lower densities, however, are not coupled with a correspondingly large increase in the diameter of the networks. The most distant actors in the Twitter network, for example, are separated by only four edges, which points to the capacity of individual actors who follow a large number of other accounts to effectively distort and reduce the distances between participants. While this undermines the potential for traditional network distance measures to sufficiently differentiate the field, it is interesting to observe the particular actors who are most responsible for contracting (and cohering) the field in this manner. Table 2.14 lists the ten accounts with the highest out-degree values from an edge-induced subgraph of the Twitter network, limited to only those edges which are following one of the 162 AMC represented composers. While both the AMC and APRA are featured as organisations whose activities span the entire field of Australian art music, the list is otherwise remarkable for the exclusive presence of accounts belonging to the jazz community in the form of service organisations, performers and festivals.

Table 2.14 Twitter accounts following the highest number of AMC represented composers

Twitter Account	**Out-Degree**
Andrea Keller	128
ABC Jazz	64
Jazz Australia	60
Australian Jazz	59
Australian Music Centre	59
APRA	58
Jamie Oehlers	56
MelbJazzFest	54
Wangaratta Jazz	51
SydneyImprovised	50

It is possible that these figures partly reflect jazz artists being better represented on Twitter than other art music sub-genres, but much of the flow of information through social media networks occurs through the jazz community's efforts to minimise boundaries and connect with a diverse range of composers. Whereas jazz was previously observed to be most successful in articulating a well-defined boundary of practice – both curatorially and acoustically – the opposite is true in social media. This outcome is likely in part a reflection of the greater marketing savvy among a younger generation of jazz artists, who see value in imbricating themselves among broader online networks among the music community. This downplaying of boundaries and engagement with diverse online audiences also provides a contrast to the older generation of jazz artists, many of whom lament the loss of jazz's previous position as a distinct field which enjoyed separate coverage and treatment in traditional media (Davis, 2020).

While the intra-AMC composer networks demonstrate high levels of reciprocity (59.8% for Twitter relations, and compared with just 3.7% for the biographical network constructed in 2.4.1.5), the relatively small size of the Twitter Mentions network speaks to the typically low intensity of relationships which are represented in social media graphs. Whereas 148 AMC represented composers had followed one or more other composers, only 88 of these composers had either mentioned another composer, or been mentioned by another composer. Reciprocity remains high for this network, but the network diameter is disproportionately large given its small number of vertices – reflecting relatively long paths separating the most distant actors. This is reflected in the median out-degree value of just two, which compares against a median of seven for the Twitter network of intra-AMC friend and follower relationships. The ease with which social networks permit affiliation relationships to form only rarely leads to subsequent social media activity which binds participants together in greater proximity.

Table 2.15 Characteristics of social media networks and sub-graphs

Network	Subgraph	Vertices	Edges	Density	Transitivity	Reciprocity	Components	Proportion of network in largest component	Diameter
SoundCloud	All nodes and edges	20,742	748,750	0.002	0.078	0.306	3	99.98%	13
SoundCloud	Intra-AMC Represented Composers only; isolates removed	132	728	0.042	0.308	0.558	2	98.48%	9
SoundCloud	Shared Follower Neighbourhood	167	5,666	0.409	0.722	N/A	1	100%	3
Twitter	All nodes and edges	66,896	10,989,149	0.002	0.118	0.356	1	100%	11
Twitter	Intra-AMC Represented Composers only; isolates removed	149	1,841	0.083	0.417	0.598	1	100%	6
Twitter	Shared Follower Neighbourhood	159	8,728	0.695	0.943	N/A	1	100%	3
Twitter Mentions	Intra-AMC Represented Composers only	88	378	0.049	0.284	0.556	2	97.73%	7

2.5.3 Actor prominence

In curatorial and composer-oriented networks, composers with increased symbolic capital and age were demonstrated as having greater prominence and centrality. Across the different forms of curation, the most prominent composers (see Table 2.8) are among the most well-known and most senior identities in Australian art music. When approached from the perspective of social media platforms, however, a very different picture of prominence emerges. Considering prominence in terms of in-degree centrality – the number of accounts a composer has *following* them – the top five composers are listed below for SoundCloud and Twitter in the complete second-order networks (Table 2.16) and the intra-AMC composer networks (Table 2.17). As an undirected network, the degree centrality measure is used for the corresponding shared neighbourhood networks (Table 2.18).

While some of the curatorially prominent composers are deceased (e.g. Peter Sculthorpe) or otherwise not active on social media (e.g. Ross Edwards), prominence in these networks is far less associated with traditional notions of seniority in the field. Across all networks, early and mid-career composers have far greater representation, which reflects the generational skew associated with social media usage (Yellow, 2018). Beyond this trend, the second-order Twitter network points to the importance of multi-faceted involvement in the field for increasing in-degree scores. James Humberstone has roles spanning academia and music technology, Matthew Sheens and Elissa Milne are active as performers, and Julian Day is a broadcaster. The multiplicity of roles which are represented in social media profiles permits those working across various domains to garner larger followings from the various audiences they interact with.

The greatest congruence between social media and composer/curatorial notions of seniority in the field is found in the Twitter shared neighbourhood network, which includes Matthew Hindson, Carl Vine and Paul Stanhope among its most prominent composers. It is firstly of interest to contrast this with the corresponding SoundCloud network, which elevates far less established composers to prominence. The musical specificity of SoundCloud not only allows it to attract a more musically engaged audience, but to favour those artists less encumbered by copyright restrictions and

more willing to share their music online. The broader audience served by Twitter, conversely, more readily permits existing popular appeal to be reflected in the artists which have greater prominence.

Table 2.16 AMC represented composers most followed in social media networks

SoundCloud	In-Degree	Twitter	In-Degree
James Ledger	1,128	James Humberstone	3.822
Charlie Chan	1,113	Matthew Sheens	2,000
Phillip Wilcher	733	Lyle Chan	1,997
David Basden	709	Julian Day	1,982
Lisa Cheney	439	Elissa Milne	1,820

Table 2.17 AMC represented composers most followed by other AMC composers in social media networks

SoundCloud	In-Degree	Twitter	In-Degree
Samantha Wolf	56	Julian Day	62
Lisa Cheney	46	Lisa Cheney	54
Mark Wolf	36	Katia Beaugeais	48
Andrew Batt-Rawden	28	Andrew Harrison	48
Nicole Murphy	26	Chris Williams	47

Table 2.18 AMC represented composers most linked to other AMC composers by shared followers

SoundCloud	Degree	Twitter	Degree
Lisa Cheney	146	Matthew Hindson	153
Annie Hsieh	145	Carl Vine	152
Alex Pozniak	141	Elissa Milne	152
Tristan Coelho	135	Paul Stanhope	152
Julian Day	134	James Humberstone	152

Modelling of in-degree centrality among the second-order and intra-AMC composer networks of Twitter and SoundCloud further confirms both the inverse significance of age and the insignificance of symbolic capital in these media. Scaling in-degree scores to a range of 1-100 to reflect the varying size of different networks, Model 2.5 demonstrates year of birth to be a significant main effect in predicting in-degree. Aside from minor interaction effects arising from the particular network in question, a composer's own activity in the network (modelled as scaled out-degree, representing the number of accounts *they* follow) was the only other independent variable which proved significant in formulating the optimal model. This characteristic is reflected in the high reciprocity and transitivity statistics observed – the more you participate in social media networks, the more 'prominent' you are likely to become. Other variables, such as the Spotify popularity of artists or their artistic prestige score, failed to achieve significance in predicting in-degree. This suggests that social media platforms are able to operate with a level of independence to the sorts of reputational systems which exist external to the platforms themselves. Just as Chapter 3 explores how different modes of mediation generate different representations of Australian art music, so too individual social media platforms are able to be differentially constitutive of the field.

Model 2.5 Predicting in-degree centrality of AMC represented composers in social media networks

Term	Coefficient	SE	T-statistic	P-value
Intercept	-323.562	79.137	-4.089	< 0.001 ***
Year of Birth	0.166	0.04	4.137	< 0.001 ***
Scaled Out-Degree	0.777	0.035	22.339	< 0.001 ***
Year of Birth:SoundCloud (intra-AMC)	-0.004	0.001	-5.341	< 0.001 ***
Year of Birth:Twitter Network	-0.001	0.001	-0.832	0.41
Year of Birth:Twitter (intra-AMC)	0.002	0.001	2.854	0.004 **

Residual standard error: 11.122 on 542 degrees of freedom

Adjusted R-squared: 0.558

*Formula: Scaled In-Degree ~ (Year of Birth * Network) + Scaled Out-Degree – Network*

Contrasts: SoundCloud Network

2.5.4 Shared neighbourhoods

While measures of network centrality provide an indication of the varying prominence of composers within each of the Twitter and SoundCloud platforms, the networks themselves provide no indication of the varying intensity of the relationships between each of the actors. While the small Twitter 'mentions' networks is able to reflect relationship intensity, its small number of composer vertices limits its effectiveness to investigate the broader field. As unweighted networks with high relatively high densities, the second-order Twitter and SoundCloud networks lack the discriminatory power to produce a dissimilarity matrix of distances between composers active on each platform. The limitations of applying standard distance calculations to unweighted networks is further exacerbated in the domain of social media, as a particularly active user who has followed a large number of composers has the capacity to greatly distort the distances between actors. When considering the shortest path between each pair of AMC composers with a degree of at least 10 (to introduce a threshold of activity on a particular platform), the most distant vertices are separated by only four edges in the case of SoundCloud (and a mean distance of 1.56) and three edges in the case of Twitter (mean of 1.87).

An alternative approach to analysing distances given these constraints can be found in the concept of shared neighbourhoods. The extent to which two actors have overlapping sets of followers (i.e. their directed first-order 'neighbourhoods') can act as an indication of their proximity as perceived by the population of actors participating in the network. Whereas neighbourhood analysis has been used extensively in analysing global characteristics of networks such as clustering (Hanneman & Riddle, 2011), it has only received limited attention as a means for deriving proximities between actors (e.g. Zafiropoulos, Antoniadis, & Vrana, 2014).

Equation 2.4: Shared neighbourhood similarity

$$s_{ab} = \frac{|n_a \cap n_b|}{min\{i_a, i_b\}}$$

As notated in Equation 2.4, the approach taken here is to calculate a similarity[29] (s_{ab}) between two actors (a and b) by firstly identifying the set of followers (n) for each actor. The cardinality of the intersection of these two sets provides the number of shared followers. To adjust for variation in the number of followers for each actor, the previous number is divided by the smallest in-degree (i) value of the two actors. If two pairs of actors – one where both actors have 100 followers, the other where both actors have 50 followers – have 10 shared followers each, this denominator ensures that the latter pair will be regarded as being twice as similar as the former. The specific s_{ab} similarity scores for each pair will be 0.1 for the actors sharing 100 followers and 0.2 for the actors with just 50 shared followers. It is unlikely that pairs of actors will share the same in-degree, however utilising a minimum value ensures that distances between pairs remains symmetrical.

The resulting networks reflect the short distances observed between Australian composers in social media networks. In addition to forming a single interconnected component with no isolates or disconnected clusters, there is also a high overlap of followers across different composer accounts. Of 162 active composers on Twitter, on average each shared at least one follower with 108 other composers in the network, with a median value of 121.5. Importantly, this application of shared neighbourhoods enables the lens of distance to be applied to understanding similarity among social networks. Traditional network approaches to calculating distance are limited when confronted with large unweighted networks whose small diameters fail to provide sufficient space in which to adequately differentiate actors. By instead conceiving of distance in terms of the commonality of network connections, the relative position of cultural producers can be mapped and analysed.

2.5.5 Mapping social media networks

The lack of overlap between composers featured in the composer survey rankings and those with Twitter or SoundCloud social media accounts prevents considering the

[29] Whereas distances have previously been represented as dissimilarity matrices (where higher values indicate diminishing similarity between actors), this statistic produces a similarity score in which higher values indicate greater similarity. The reciprocal of this value is used to directly convert these values to a dissimilarity matrix, in which the main diagonal values are specified as zero and pairs of actors with no shared followers have a value of infinity.

extent to which the latter networks exhibit correspondence with the composer perspective of the field. This lack of correspondence is of interest in itself, however, as it again points to the fragmentation of the field which arises when considered from diverse perspectives. The shared neighbourhood similarity scores do, however, support mapping the field using multi-dimensional scaling (MDS). While the raw dissimilarity matrix resulting from Equation 2.4 produces too many infinite distances to be useful, the similarity scores can instead be used as a set of edges to create a weighted network of AMC represented composers. For both Twitter and SoundCloud, these networks have just a single component and are therefore suited to producing their own complete dissimilarity matrix using the Dijkstra distance algorithm implemented in `igraph` (Csárdi, 2019).

Non-metric scaling of the resulting Twitter shared neighbourhood matrix with two dimensions results in a stress score of 42.40%, however adding a third dimension manages to reduce this to 17.82%. The first dimension of this MDS is plotted below against each of the second (Figure 2.19) and third dimensions (Figure 2.20), with a sample of composers selected to avoid clutter and aid interpretation. The corresponding SoundCloud network showed similar improvement in goodness of fit between two (47.44%) and three (19.04%) dimensions, with the latter configuration plotted with a similar sample of composers in Figure 2.21 and Figure 2.22. Clustering of both dissimilarity matrices using the partitioning around medoids (PAM) method produced just two clusters; the SoundCloud clusters were balanced in size and non-discriminatory in musical style, whereas the Twitter clustering produced a small cluster (n = 23) with predominantly jazz artists and a larger cluster (n = 131) of stylistically mixed composers.

Figure 2.19 3-dimensional scaling of Twitter shared neighbourhood derived network (dimensions 1 and 2)

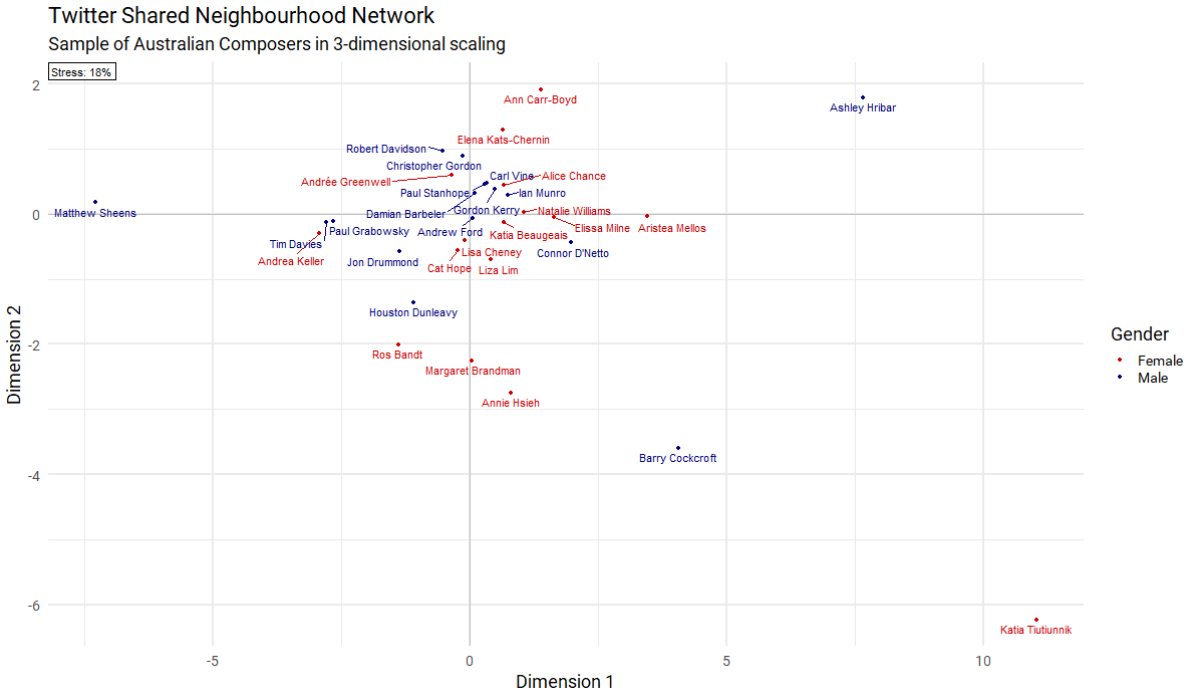


Figure 2.20 3-dimensional scaling of Twitter shared neighbourhood derived network (Dimensions 1 and 3)

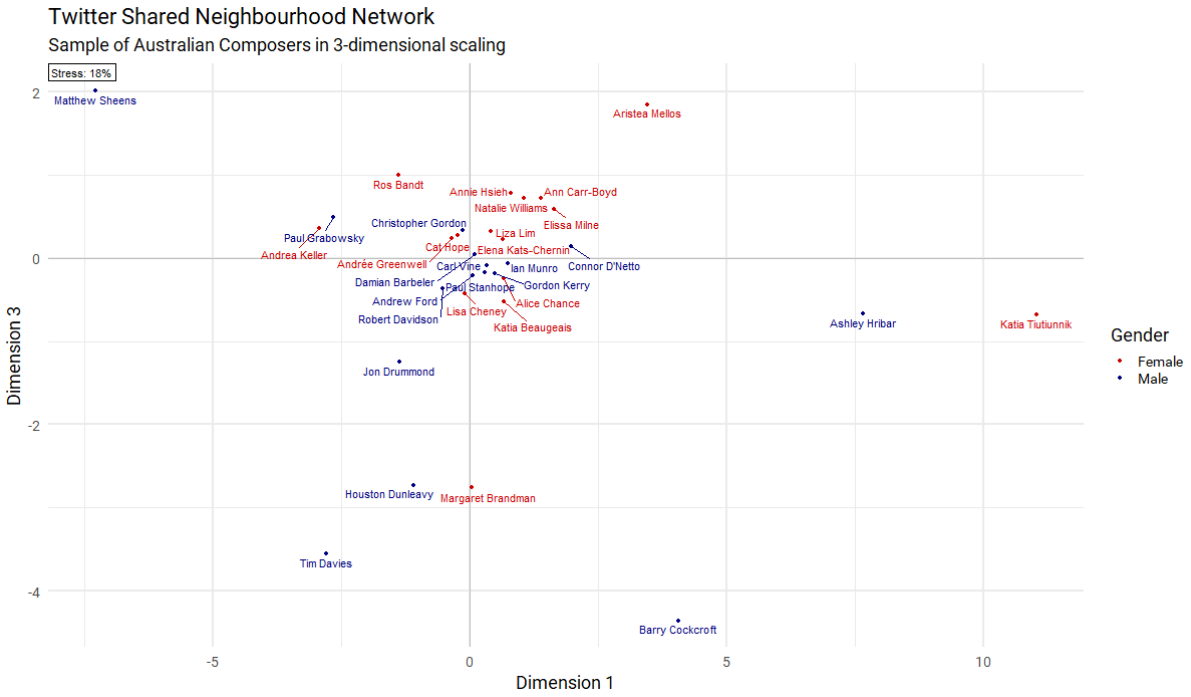


Figure 2.21 3-dimensional scaling of SoundCloud shared neighbourhood derived network (dimensions 1 and 2)

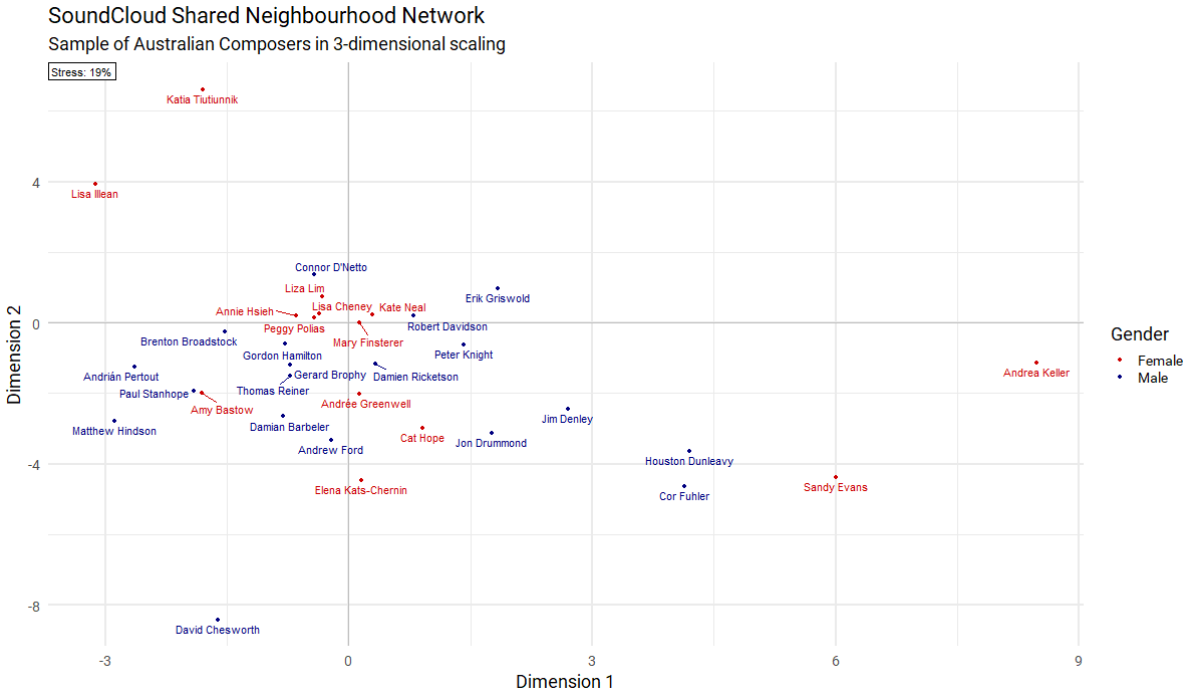
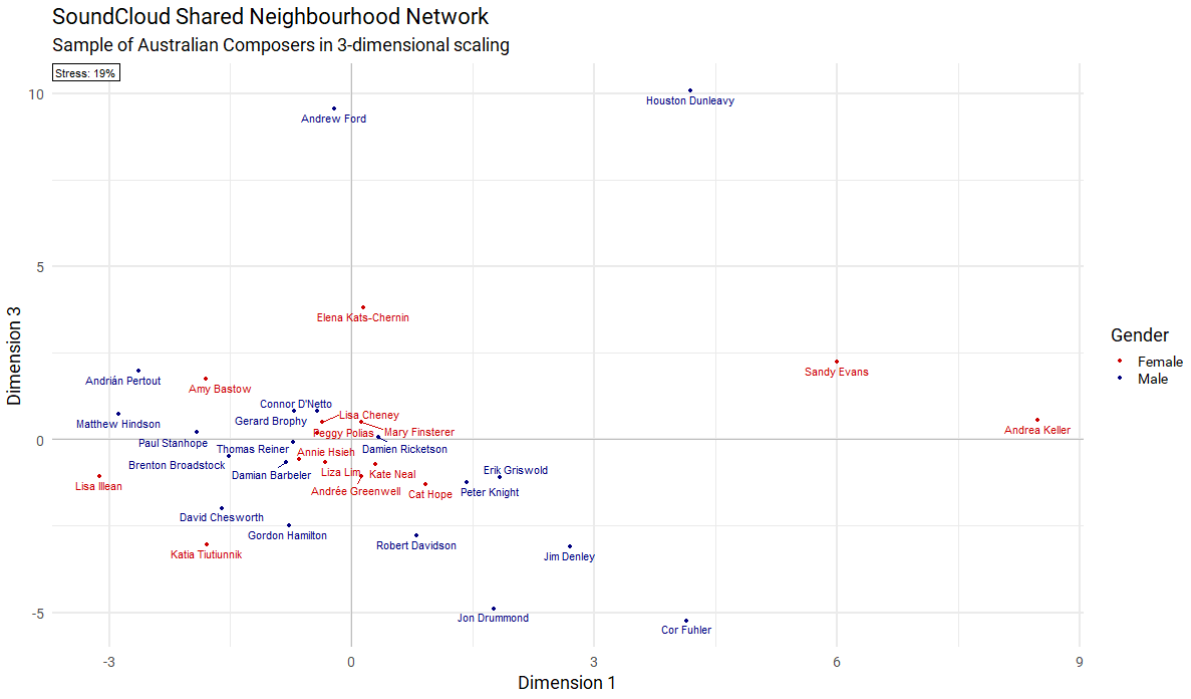


Figure 2.22 3-dimensional scaling of SoundCloud shared neighbourhood derived network (dimensions 1 and 3)



The maps firstly demonstrate that social media shared neighbourhood networks are considerably more successful in producing differentiated maps of the field when compared to maps derived from curatorial networks (e.g. Figure 2.18). The capacity of the various dimensions to reflect identifiable stylistic attributes of the composers, however, is limited. Whereas the acoustic networks produced identifiable contrasts

between composers (see Table 2.4), shared neighbourhoods are more fluid in the latent criteria which cause composers to be proximate to or distant from each other. The only dimension to offer a readily interpretable stylistic interpretation is found in Dimension 1 of the SoundCloud map, which broadly places jazz influences on the positive pole and a diverse mix of styles (e.g. the timbral and acousmatic nature of Lisa Illean's music is alongside the typically pop-influenced rhythmic style of Matthew Hindson) on the negative end of the spectrum.

This suggests that the stylistic contours of an artistic field – particularly those which arise from the perspective of producers and the acoustic characteristics of the music – do not translate into similarly demarcated dimensions of appreciation and 'consumption'. The gap between these two perspectives was previously observed in terms of an *inability* to distinguish different stylistic approaches in the case of Menger's (2017) analysis of Ensemble intercontemporain (EIC) concert audiences. For such listeners, they would be understandably confounded if asked to produce such a map of the field given their ignorance of stylistic concerns. In the case of an affinity network of social media usage, however, it is more likely to speak to the *ambivalence* towards stylistic concerns in the formation of networks. In this respect it is unsurprising that SoundCloud, as a social network formed around recordings of music posted by account holders, would exhibit at least some of the stylistic differentiation along the axes of its dimensions. By and large, however, constructing the field of producers from the perspective of social media affiliation, as a mode of consumption, would appear to reflect more stylistic eclecticism and heterogeneity with respect to musical taste. These findings should also be considered in the context of the demographics of social media users. Not only are the composers active on Twitter and SoundCloud relatively young, but the generic consumer will exhibit a similar demographic skew. As these networks sediment over time, or if a greater proportion of consumers had their preferences reflected on these platforms, we might expect more clearly demarcated dimensions to emerge.

In addition to eclecticism, the maps also point to the potential for social media networks to reflect the political dimensions of how the field is understood. To varying degrees, each of the Twitter and SoundCloud shared neighbourhood maps show

tightly grouped clusters of emerging (e.g. Annie Hsieh, Peggy Polias, Lisa Cheney) and mid-career female composers (e.g. Kate Neal, Andrée Greenwell, Natalie Williams). Social media affiliation, as a mode of consumption, therefore demonstrates a capacity to reflect more demographic considerations in terms of who is brought into proximity with each other. In addition to mirroring the types of support networks and initiatives which exist outside of social media (such as the Women in Music Festival) which influence the field of Australian art music, these demographic considerations can also verge into the more ideological and can be observed as fracturing communities that would otherwise cohere around acoustic features and musical style. In the Twitter network, in particular, the large distances which are introduced between jazz artists such as Tim Davies and Paul Grabowsky show how even sub-fields which were previously well-defined can fracture when viewed from alternative perspectives.

2.5.6 Summary of social media analysis

The analysis of social media networks offers a markedly different conception of the space of producers compared to the previous acoustic/composer and curatorial perspectives. While projections of social media platforms are skewed by composers' varying levels of activity and usage, they nevertheless demonstrate an absence of the traditional organising principles which were previously observed. Stylistic differentiation only plays a minor role, and is limited to the audiophile SoundCloud network, whereas actor prominence is dominated by early and mid-career composers. Furthermore, the use of shared neighbourhood distance techniques highlights the stylistic eclecticism with which composers are collectively juxtaposed by audiences. While social media behaviours and musical tastes should not be expected to be conflated in any case, these gaps nonetheless point to considerably more heterogeneity in patterns of art music consumption than might be otherwise anticipated based on producer and curator perspectives of the field. Not only do heterogeneous patterns emerge within individual social media networks, but different networks are also shown to be uniquely constitutive of the field and resist any general assumption of social media as homogeneous platforms.

Within the increasing constraints of access to social media data, the analysis points to the opportunities to scrutinise social media representations of the field through network modelling. While MDS maps did not provide visual evidence of stylistic based clustering, modelling of network ties offers the potential for more fine-grained consideration of the extent to which stylistic composer attributes may selectively introduce homophily effects. Similarly, greater scrutiny of localised clustering and clique formation, and the relationship with ideologically framed participation in Australian art music, would also provide greater insights into the capacity for social media to reproduce and reinforce such understandings of the field of production.

2.6 Conclusion

The analyses undertaken in this chapter collectively draw attention to the multiple ways in which the dimensions of a field of cultural production can be understood. Instead of a singular map produced by Bourdieu's focus on the 'objective relations' which underpin positions in a field, this chapter has instead sought to interrogate and contrast alternate ways of assembling and engaging with the field of Australian art music. By modelling the similarities of the acoustic material of the field, together with the perspectives of composers, curators and social media audiences, the different organising principles of distance and similarity which underpin these various ways of conceiving of the field can be brought into relief.

In particular, the analysis points to shifting emphasis given to stylistic concerns in organising the field. From the perspective of composers, as approximated through a model based on recordings of their music, the space of producers is able to reflect dimensions of compositional style. The three dimensions produced from MDS mapping successively contrasted three key features: modernism and minimalism, experimental and traditional techniques, spiritualism and serialism. As an approach to quantifying similarity, both the specific dimensions and the overall multivariate model feature in subsequent chapters which examine how these distances can translate to the related concept of familiarity.

In reconfiguring this space in presenting art music to audiences, curatorial processes were observed as minimising distance and elevating the prominence given to highly

regarded composers. Stylistic concerns are still apparent, but they are much stronger in the specific sub-genre of jazz. This reflected the tighter clustering observed among jazz in the acoustic analysis and points to the relative autonomy of jazz within the broader field of art music. This stems from the specific history of Australian art music, whereby jazz – in contrast to other sub-genres which emerged from *within* art music practice (e.g. serialism) – was strategically integrated into art music's boundaries. Whereas the specific sub-genres which emerged from within the field struggle, both acoustically and curatorially, to establish a clearly demarcated identity, jazz demonstrates a greater ability to be recognised as a discrete practice. When contrasted with the perspective of social media audiences, however, stylistic concerns are largely absent. The way in which audiences coalesce around groups of composers fails to exhibit clear stylistic influences. The nature of affiliation networks on Twitter and SoundCloud suggest far more heterogeneous appreciation of styles, and more space for demographic and ideological based groupings of composers. That participation on Twitter, in particular, is largely removed from processes of *listening*, perhaps provides greater ability for users to eschew stylistic concerns.

The chapter also posits new methodologies for investigating the structure of fields by applying multivariate and network analysis techniques to large datasets. While the era of big data is undoubtedly partial, and increasingly constrained by commercial interests, researchers nevertheless have access to unprecedented data on cultural fields. The comprehensive availability of the material outputs of a field itself – in the form of audio recordings – presents new opportunities to apply techniques of acoustic feature analysis to relationally map the space of producers. Additionally, the capacity to construct formal graphs of relationships of how composers are linked and assembled, by both curators and audiences, permits the application of descriptive and inferential network analysis techniques as a further method for quantifying otherwise vague notions of similarity and distance. The combination of multiple methodological approaches further permits analysing distance from multiple perspectives and attending to the variations which occur in how the field is constituted.

A range of opportunities for further research is opened up by both the empirical findings and methodological techniques employed in the chapter. Foremost is the

capacity to adopt a longitudinal lens to the analysis of fields which more adequately reflect the trajectories of composers from the various perspectives in the field. The current analysis has effectively considered composers as the cumulative sum of the artistic careers at a point in time, however this lacks the capacity to adequately theorise fields as relationally dynamic fields. The ways in which individual composers move through the space of producers over the course of their careers offers the opportunity to consider the generative processes involved in the evolution of artistic fields. Technically, the use of temporal inferential modelling techniques, such as the nascent temporal family of ERGM models (Krivitsky & Goodreau, 2019), offers new avenues for investigating field dynamics. The ongoing refinement of techniques for fitting weighted networks (Krivitsky, 2019) also offers new opportunities for going beyond the more limited binary modelling of networks undertaken in the current analysis.

The findings also point to opportunities to more substantially interrogate the gaps which emerge between different framings of the field. As a field of restricted production, it is unsurprising that the logic of its producers should produce framings of the field which are most easily explicable. The issue of the organising principles by which clusters and cliques of composers are drawn into association in the realm of social media, however, is an example which calls for closer scrutiny. Embedding composer-oriented understandings of distance into recommendation algorithms may assist in the autonomy of Australian art music, however it may be at odds with how audiences frame their engagement with the field. Further scrutiny of the organising principles of each perspective, together with the gaps and reconfigurations which occur, will permit richer theorisation of how different processes of mediation are involved in producing the relational distances which help inform our capacity to know and engage with the domain of Australian art music practice.

3 Curating (un)familiarity: The assemblage of Australian art music in radio, concerts and digital playlists

Between spaces of cultural production and their consumption by audiences lie a range of intermediaries which help shape the reception of artists and their work. Beyond the meanings which are attached to particular works, different modes of presentation involve selecting and assembling particular representations of the field itself. For Australian art music, the curatorial processes of radio, concert programming and digital playlists each offers alternate contexts through which audiences can discover, comprehend and engage with unfamiliar music. This chapter investigates these varying representations of the field through a quantitative content analysis of the music featured on each of these three platforms. After firstly describing how each situates contemporary Australian art music in the broader context of classical music, it then examines how different platforms mediate the concept of 'familiarity'. In addition to considering how cultural producers' varying levels of symbolic and economic capital are distributed in the selections made by curators, the analysis develops three measures of familiarity – quantified as distances and separately based on presentation frequency, popularity and distinctiveness – to demonstrate the varying musical heterogeneity exhibited by each platform. The chapter concludes by shifting from comparing platforms to examining the variation of how unfamiliar music is curated within platforms. Time of day, individual programs and playlists, together with the curator themselves all play significant roles in how and when audiences are exposed to unfamiliar sounds. The findings emphasise the increasing barriers to introducing audiences to the unfamiliar which are accompanying the current trend from radio to digital playlist consumption.

3.1 Introduction

All art forms involve processes of 'mediation' which help shape the context in which they are received by audiences and the meanings which are attached to works. This theorisation of mediation borrows from Latour's (2005, p. 39) distinction between 'intermediaries' and 'mediators'. For Latour, whereas intermediaries 'transport meaning … without transformation', mediators have a specificity which 'transforms, translates, distorts, and modifies the meaning of the elements they are supposed to carry'. In the context of brokering music, both have resonance, but the idea of 'mediators' points to those actors and processes which have the capacity to shape the ways in which a field and its music is understood. In this regard, considerable attention has been paid to the mediating influence of social practices (Born, 2005), social spaces (Becker, 2004), technologies (Beer, 2009) and locations (Skandalis, Banister, & Byrom, 2016) which surround the 'consumption' of music. Rather than a passive act of reception, these approaches posit listening as an active process in which the construction of meaning is variously located in, and constrained by, the social and psychological domains. Much research in this area is specifically focussed on processes of musical sense-making in the context of the *familiar*. Studies of opera fandom (Benzecry, 2011), radio listening (Tacchi, 2003), musical attachment (Hennion, 2001) and of listening to music to induce or enhance particular moods (DeNora, 2000) all emphasise processes of selecting predominantly familiar music which can elicit particular affective outcomes.

Even in these moments of apparent self-selection and construction of the listener's preferred musical world, however, we are not completely autonomous in controlling the sounds which reach our ears. While we may express our preferences in the choice of radio station, concert attendance, or how we assemble our digital music ecosystem, all of these modes of listening involve their own processes of external curatorial mediation in the selection and sequencing of works. Beyond processes which make any of these listening options capable of being made a 'choice' in the first place, each mediates the space of cultural production with its own inflections and emphases. Just as an art gallery curator 'hangs' a space, music programming is a role typically performed by a professional whose function is to assemble a coherent set of works and composers, and constitutes a specific form of mediation. The metaphor of the

'journey' is commonly deployed to depict the way in which the curator is tasked with guiding the listener through a space of artistic practice by making programming decisions. These decisions typically involve taking an artistic intention and balance the needs and expectations of an imagined audience to be variously enticed with the familiar and challenged with the unexpected. For Bourdieu, the importance of such actors – who help to 'create the creator' (1993, p. 76) through their generation of symbolic and economic capital – cannot be overestimated. Among them he includes both actors in dominant positions of the hierarchy of cultural production (e.g. art dealers, publishers, theatre managers), together with the 'new cultural intermediaries[30]' who work in industries such as radio and television to gently manipulate tastes (1984, pp. 365-366). Bourdieu's interest in this new profession of taste makers lies largely in its manifestation of class dynamics among the new upwardly mobile petite bourgeoisie, which Dubois and Lepaux (2018) argue is today largely a career choice available to a privileged elite. The concept of the cultural intermediary has also been used in the context of the *distance* between production and consumption (Negus, 2002). For Negus, the notion that cultural intermediaries *bridge* the distance between producers and consumers is an illusion which the intermediaries help circulate while they actually serve to reproduce such distances. The trend for arts managers more generally to be drawn from 'higher and more restricted social backgrounds' (Dubois & Lepaux, 2018) further emphasises the kinds of social reproduction which may be embedded in the role of curation.

For a field such as contemporary Australian art music, different platforms of mediation can therefore be observed as offering their own particular representation of the space of cultural production identified in Chapter 2. In doing so, the thesis' central concern with distance emerges in how this space is assembled and, in particular, how each platform affords a role to *unfamiliar* music. While familiarity is ultimately a concept which is located at the level of an individual's relationship to a work – a perspective which is explored in Chapter 4 – curators and programmers are necessarily engaging with an imagined audience. The constellation of artists which

[30] Bourdieu's use of 'intermediary' is unrelated to Latour's previously discussed use in distinguishing that term from 'mediators' able to transform meaning.

are assembled in programs of music will form pathways which traverse varying degrees of familiarity. For audiences, the concept of unfamiliar music is also linked to processes of music discovery. Whereas studies analysing the technological conditions of musical taste have pointed to the democratising affordances of digital technologies, Nowak (2016) argues the promises have been overstated. While Nowak emphasises the sociological and affective dimensions of music discovery, the commercial manipulation of listening environments should not be overlooked. Alongside the dramatic rise and influence of Spotify, a range of commercial services have emerged to coordinate campaigns designed to ensure artists are featured on influential playlists. Echoing the 'payola' which plagued radio broadcasting and was criminalised in 1960 (Coase, 1979), this reinforces the lack of neutrality in technical platforms which have been demonstrated as playing an important role in encouraging experimentation and diversification of listening habits (Datta, Knox, & Bronnenberg, 2018).

3.1.1 Chapter overview

Focussing in particular on the theme of familiarity, the aim of this chapter is to analyse how the curatorial logics of different modes of presentation mediate the field of contemporary Australian art music to audiences. It begins by reviewing data on the importance of different platforms for processes of music discovery to establish the importance of radio, live concerts and digital playlists in exposing audiences to the unfamiliar. The methodological approach taken to obtaining datasets for content analysis is then detailed. Beyond obtaining raw data for each platform, this involved applying various transformations to the data, together with matching and cross-referencing to support analysis on dimensions such as gender, nationality and historical era. The resulting datasets have been published as a separate output, as a series of data files, to support further analysis (see Appendix D). The methodology section then reviews the three ways in which familiarity has been operationalised for analysis, in terms of presentation frequency, popularity and distinctiveness. The development of novel metrics was also necessary to approximate the accumulated symbolic and economic capital of composers, which supports the analysis of how curators draw upon and reinforce particular positions in the field of cultural production.

The analysis of data begins by firstly situating contemporary Australian art music among the presentation of classical music more generally. The different historical eras of music composition, spanning pre-Baroque to post-modern, are central to how audiences engage with classical music and the data show that the radio audiences of ABC Classic FM are exposed to the most 'conservative' music clustered around heritage composers. With respect to gender, radio also has the most pronounced under-representation of women composers. In terms of geography, however, the localised contexts of both concert programming and radio ensure considerably greater representation of Australian content.

The role of familiarity is then explored in terms of presentation frequency, popularity and distinctiveness of the content featured on each platform. The findings point to unfamiliar music being most present in the programming of concerts, followed by radio and then playlists. The under-representation of Australian art music on digital playlists is a particular theme which emerges throughout the analysis. A focus on which Australian composers achieve exposure on ABC Classic FM is then examined in terms of how symbolic and economic capital intersect with age. In particular, the established forms of legitimacy consecrated by ABC Classic FM as a dominant institutional actor are shown to be at odds with the forms of artistic prestige which are accumulated by young Australian composers.

The analysis then shifts from contrasting discrete platforms, to examine contexts of curation *within* particular platforms. In addition to assessing the times of day when unfamiliar music is presented, it also considers how individual radio programs and Spotify playlists differently embrace largely heterogeneous or homogeneous sound worlds. The final focus of analysis examines the capacity for particular curators to influence the representation of art music experienced by audiences. Different categories of performers are demonstrated as having an influence on the gender-imbalance among composers in art music, with women and medium-sized ensembles playing important roles.

3.2 Platforms for discovering music

To first establish the role of different platforms in supporting processes of music discovery, data from an online survey is presented in Table 3.1. Conducted in October 2018, the survey asked participants questions pertaining to musical preferences and behaviours and is discussed in further detail in Chapter 5. The survey included three cohorts of respondents, representing those with a pre-existing interest in contemporary Australian music, those with a more general interest in classical music, and those who were primarily interested in non-classical idioms. The table shows responses to a question on how frequently people used different platforms to discover new artists or composers. While the degree of unfamiliarity is not captured in the question – listeners could be traversing new musical styles or exploring within a familiar genre – it nevertheless points to the ongoing pre-eminent role played by radio. As one of the most widely available platforms, 26% of respondents reported using it on at least a weekly basis to support music discovery.

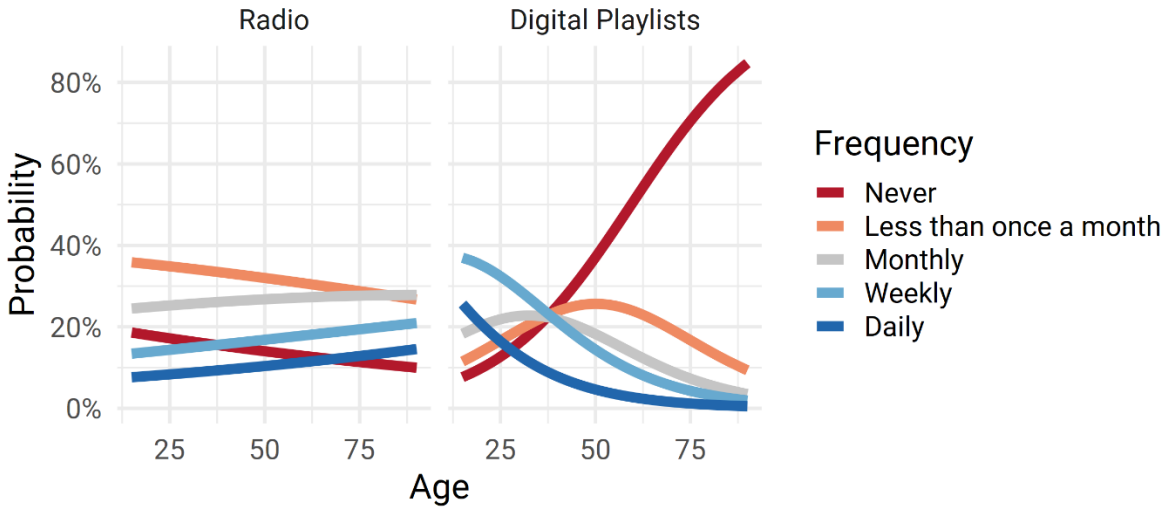
Table 3.1 How often do you use each of the following to discover new artists or composers?
n = 326; response rate = 93.1%

	Never	**Less than once a month**	**Monthly**	**Weekly**	**Daily**
Recommendation from a friend	10%	48%	26%	14%	2%
Radio	14%	33%	27%	17%	9%
Festival or Concert	21%	48%	25%	5%	2%
Music journalism	25%	34%	27%	10%	3%
Social media	30%	31%	21%	15%	3%
Playlist on a digital music service	41%	21%	17%	15%	6%
Suggestion from a digital music service	46%	21%	17%	13%	4%
Podcast	56%	24%	13%	5%	1%

At 21%, digital playlists represent the second most utilised platform used on a weekly or daily basis. The increasing influence and importance of playlists is evident in reports showing that in May 2016 Spotify's own curated playlists were already responsible for generating over 1 billion streams per week (Houghton, 2016). Spotify's paying subscriber base has nearly tripled in that time, with considerable media coverage also testifying to the increasing importance of playlists, as opposed to radio airplay, in the discovery of artists (Pierce, 2017).

It is interesting to observe that, when age is accounted for, the data did not show any substantial shifts in usage patterns among the three cohorts of users representing varying familiarity with contemporary Australian art music. This suggests that the adoption of digital platforms is equally prevalent among and important to contemporary Australian art music listeners as it is among fans of popular music genres. As discussed in Section 5.4.1, however, the importance of music discovery was shown to diminish with age. This reflects older listeners tending to be more fixed in their established listening habits and suggests greater reluctance to use media landscapes in which unfamiliar music dominates. The data also point to age being relevant to the utilisation of particular platforms. In particular, an inversion can be observed between patterns of radio and digital playlist usage. Figure 3.1 visualises an ordinal logistic regression of frequency against age, showing moderate declines in regular radio usage as age decreases. The inverse is true for digital playlists, with younger listeners far more likely to engage with daily or weekly usage of this platform for music discovery. Despite the overall dominance of radio, the data suggest that it is progressively being replaced by digital playlists as the adoption of digital streaming increases among young listeners.

Figure 3.1 Frequency of radio and digital playlist usage for music discovery, by age



The high frequency of both radio and digital playlists, together with their opposing correlations with age, justifies their inclusion in the subsequent content analysis to contrast how contemporary Australian art music is represented in each. Despite their relative low frequency, live concerts were also selected based on their frequently cited centrality to the Australian art music scene. As Grant, one of the participants interviewed in Chapter 4 responds when asked how important live concerts are:

> *Grant:* *I think for most forms of music that I'm interested in, the live is the, the quintessential version.*

While discovering music at concerts at the frequency of radio or playlists is prohibitively expensive and logistically impossible, the survey data nevertheless show that few participants *never* attend concerts to discover new artists and works. Furthermore, the relatively large investment required to attend pre-conditions audiences to anticipate a positive experience, while simultaneously placing greater onus on concert programmers to ensure that their audiences respond positively and will subsequently become repeat attendees.

3.3 Methodology

The investigation of contrasting representations of contemporary Australian art music on different platforms in this chapter utilises a quantitative content analysis approach. The data analysed includes raw radio logs from Australia's largest classical radio

network (ABC Classic FM), Spotify playlist data and concert event listings from the Australian Music Centre's (AMC) comprehensive catalogue of art music practice. This data was further enriched with variables from third-party sources such as the Musicalics and MusicBrainz databases and Spotify and iTunes application programming interfaces (APIs). In detailing the specific methodology used, this section firstly reviews the concept of an 'authority file'[31], which was used to provide authoritative reference points for the composers featured in the raw data obtained for content analysis. While each platform involves the curation of specific works, composers were selected as the most granular level of data for subsequent analysis. This was due in part to the challenges of reliably identifying distinctive works in the reported data, together with technical considerations pertaining to the calculation of distances. As observed in Chapter 2, the use of multivariate Mahalanobis distances introduces a threshold of observations for each item being compared. While individual composers do themselves often encompass diverse stylistic output, the symbolic unity represented by the named composer can itself be recognised as part of the organising structure of the art music field.

The use of composers also introduces two perspectives from which to analyse the data for each platform. The first of these simply considers the unique set of composers featured in each dataset, which is subsequently referred to as a 'composer-perspective'. The second approach takes into account the varying frequency with which each composer is featured on each platform. In this 'item-perspective' – which analyses individual broadcasts, concert program items, or playlist entries – a composer with 200 works has a ten times greater weighting in the analysis than a composer with just 20 works. The two perspectives permit different questions to be asked of the data and, by comparing the two, allow greater understandings of how curation decisions shape the mediation of music to audiences.

[31] The concept of an authority file is borrowed from librarianship, where a list of authoritative terms – in this case composer names – is used as a controlled vocabulary to establish consistent entries against which variant names (e.g. 'Mozart', 'Wolfgang Amadeus Mozart') can be matched. Additional data points are then able to be appended to the authoritative term only.

Beyond the *names* of composers, the use of an authority file to permit the addition of dimensions not present in the raw data is then reviewed. These extra dimensions encompass variables from external sources (e.g. composer gender and nationality), together with novel dimensions pertaining to symbolic and economic capital which were generated to support the current analysis. The latter includes approaches to operationalising the artistic and economic prestige of the composer. These concepts reflect artistic and commercial success and can therefore be considered as bearing a relationship to a composer's likely familiarity. More significant, however, was the development of three formal approaches to measuring the familiarity of each item being analysed. These include calculations which draw on measures of the presentation frequency, popularity, prestige and distinctiveness of the composer being broadcast.

The methodology section concludes by reviewing each of the specific data sources which was harvested to generate the raw data for the comparative analysis of radio, concert programs and digital playlists. The application of considerable data processing and manipulation was necessary to prepare each set of raw data for analysis and match it to authoritative data. The resulting cleaned dataset has been separately published to support replication and further analysis (see Appendix D).

3.3.1 Authoritative composer data

Beyond the textual description of a work's composer which was obtained for each item in the raw data, the analysis sought to map each composer to an authoritative term. This not only permits overcoming spelling variations which would otherwise dilute the contributions made by individual composers, but also permits additional data points to be mapped to each composer. The particular attributes of interest to the analysis were date of birth, gender and place of artistic activity. Date of birth was selected due to its capacity to classify composers into the historical era of their activity. These eras – such as Baroque, Classical and Romantic – are central to how audiences demarcate the landscape of classical music (London, 2013). Having this attribute therefore allows the relative position of *contemporary* Australian art music to be located in the analysis. Table 3.2 summarises the historical eras used in analysis and the date ranges for how composers were allocated based on their year of birth.

The nationality or place where a composer was artistically active is also of particular relevance to the current study given its concern with how *Australian* art music content is curated to audiences. Finally, questions of gender are particularly salient to the presentation of art music. This is shown in initiatives such as the recent Gender Equity and Diversity in Opera Summit (Holowell, 2020), together with academic enquiry into discriminatory concert programming (Macarthur, 2014).

Table 3.2 Definition of historical eras

Historical Era	Date of Birth Range	Indicative Composer Range
Pre-Baroque	< 1565	Hermann von Reichenau – Hans Leo Hassler
Baroque	1565 – 1709	Monteverdi – Quantz
Classical	1710 – 1769	Pergolesi – Romberg
Romantic	1770 – 1874	Beethoven – Rachmaninoff
Modern[32]	1875 – 1919	Ravel – Bernstein
Post-modern	> 1919	Piazzolla – Mazzoli

A database of candidate authoritative composer terms, against which the raw data could be matched, was developed by compiling information from three separate sources. The first of these was the Australian Music Centre's (AMC) database of approximately 2,000 Australian composers and sound artists. The field of contemporary Australian art music is relatively niche and poorly represented in most repositories of classical music. The AMC's database was, therefore, essential to ensure that these Australian composers were able to be appropriately represented in the content analysis. Secondly, the Musicalics website provides biographical data on over 26,000 classical composers. The data is largely sourced and edited by a community of users and it provides a more exhaustive coverage than traditional sources such as Grove Online (which details just under 17,000 composers). Finally, MusicBrainz represents a community edited music encyclopaedia of approximately 14 million musical artists. While the quality of its data is less consistent, it nevertheless provides

[32] While the terms 'modern' and 'post-modern' can be considered stylistic classifications, their use in this content analysis is purely in terms of denoting historical eras.

important coverage of composers who are not customarily programmed alongside ‘art’ or ‘classical’ music.

The process of matching the composer names occurring in raw data was implemented through scripts which scored the text similarity[33] of each candidate name to entries in the database of authoritative composer terms. Manual verification was used to identify appropriate confidence levels for similarity scores, above which a match could be considered valid. This approach to matching introduces the risk that composers who are less prominent and do not feature in third-party sources will be under-represented in the subsequent analysis. Spot checking of unmatched raw data, however, suggests that prominent composers were equally likely to be unmatched as a result of spelling errors and data entry mistakes. Statistics on the matching rates achieved for each platform, which range from 89.13% to 91.48%, are detailed in the respective summaries of each data source below.

In addition to supplementing biographical dimensions of the composer, the analysis also sought to match each authoritative composer term to its corresponding artist record in each of Spotify and iTunes. This matching was done using publicly available APIs and implementing a text similarity scoring and verification process similar to that described above. Instead of biographical attributes, Spotify offers data on the popularity of individual artists on its service in terms of the number of listeners ‘following’ an artist, together with a ‘popularity’ score. As discussed in Section 3.3.3 below, these composer-level attributes can be utilised in developing measures of familiarity. iTunes offers only scant artist information through its public API, but it does provide access to its library of over 65 million sample recordings. Matching artists to their corresponding iTunes entry means their recordings can be subjected to the acoustic analysis techniques detailed in Chapter 2. For the purpose of the present content analysis, the resulting 'acoustic distances' between composers are able to be utilised in the development of a ‘distinctiveness’ measure of familiarity as detailed in Section 3.3.4 below.

[33] Utilising Apache Lucene’s refined vector space model (VSM) for similarity scoring.

3.3.2 Presentation frequency as familiarity

The simplest metric for assessing the familiarity of an individual work featured in the content analysis is by considering how *frequently* that work's composer is featured in the selected dataset. Assuming that each platform itself becomes a key medium for listeners to familiarise themselves with repertoire, then the degree to which a composer is likely to be familiar to listeners can be assessed based on the number of broadcasts, public performances or playlist curations they receive and their resulting centrality in how the sub-field is mediated to audiences.

As shown in Equation 3.1, the metric f_i represents a simple frequency score for composer i in the multiset of the composers of each work in the dataset for a given platform C, with c being the composer of each work being iterated.

Equation 3.1: Presentation frequency score

$$f_i = \sum_{c \in C} \mathbf{1}_{\{c=i\}}$$

Additionally, a context-specific presentation frequency measure f_{ip} can be derived using the subset of those curations C_p from a particular context p, where the context might be a specific radio program, a specific performer or a specific playlist. This context-specific measure permits greater specificity in measuring familiarity among listeners who only listen to particular broadcast programs or specific playlists.

Equation 3.2: Context-specific presentation frequency score

$$f_{ip} = \sum_{c \in C_p} \mathbf{1}_{\{c=i\}}$$

3.3.3 Popularity as familiarity

While the presentation frequency measures above provide insight into which composers are relatively obscure or popular in a particular medium, this can be complemented by a universal measure of *popularity* which is not constrained by the stylistic or programming considerations of a specific platform. That significant cleavages between platform-frequency and global-popularity in the musical field should exist is unsurprising. The curatorial decisions made by particular platforms – following their own commercial and artistic rationales – seek to present their own

representations of the musical field, and the disjunctures which occur between presentation frequency and popularity are therefore of particular interest to the current analysis. Additionally, the curatorial decision to include globally popular artists in programming art music – particularly those who fall outside traditional definitions of the field – can be interpreted as cues to familiarity as an approach to broadening the genre's appeal to a wider audience.

As the most ubiquitous digital music service, Spotify's measure of artist popularity was selected as the means for assessing global popularity. This measure is only able to capture usage on a single platform, and, given the survey results discussed in Section 3.2, will likely be skewed towards popularity among younger audiences. These limitations are offset, however, by the breadth of artist coverage offered by Spotify's platform. Furthermore, the market dominance of Spotify at the time of research bolsters its capacity to act as a proxy of global popularity. As part of its publicly accessible Web API, Spotify's object model for artists specifies an integer from 0 to 100 based on the aggregated popularity of all of the artist's tracks in the service (Spotify, 2018). The formula by which this score is calculated is not able to be inspected, however a sample[34] of popularity scores for 2,771,211 artists shows it to be heavily skewed towards smaller values. The mean of the sample is 3.48 and 65.01% of artists have a popularity score of zero; only a single artist, Drake, received a rating of 100. This skew suggests that, for a niche field such as contemporary Australian art music, the capacity for this popularity measure to be significantly discriminating *within* the sub-genre is likely to be limited.

In addition to the somewhat opaque popularity score, Spotify's API also publishes the discrete number of users on the service who have elected to 'follow' each artist. The Spearman rank correlation coefficient for the two measures is 0.63, which suggests there is room for significant gaps to emerge between the *behavioural* listening

[34] This sample was derived by querying the Spotify API for all artists featuring in the LFM1b dataset, Classic FM broadcast dataset, Australian Music Centre Event Calendar dataset and Spotify playlist data. Due to it being based on artists who have already achieved a level of visibility by featuring in these datasets, it most likely understates the degree to which data is skewed towards low values.

measure of popularity and the more *symbolic* act of electing to identify as following a particular artist.

3.3.4 Distinctiveness as familiarity

A necessary drawback of the presentation frequency and popularity measures is that each composer is effectively reduced to a single dimension within the respective fields of restricted or large-scale production. Cole Porter, Alexander Scriabin and John Adams all share a popularity score of 46 and fall within a narrow range of presentation frequency scores in the broadcast data, however their music could not readily be considered similar, nor would one expect a listener who is familiar with one to be overly familiar with the other two. To attempt to address this, an acoustic distinctiveness score was developed which draws upon the 13-feature multivariate model identified in Section 2.3.2 above. That the acoustic features included in this model were able to be related to perceptual qualities of the music further establishes its ability to correspond with perceived familiarity.

As specified in Equation 3.3 below, the metric considers how acoustically similar an individual composer is to each other composer in the dataset for a particular platform and weights the resulting score based on the presentation frequency scores of the composers being compared. In this equation, u_i is the distinctiveness of composer i as calculated by taking the distances d_{ij} between i and each other composer j in the multiset of the composers of each work in the dataset for a given platform C. Each distance is weighted by the number of occurrences of j in the set of all elements b for which a distance can be determined. For a distance to be able to be determined requires both i and j to have a threshold number of recordings – either from the AMC or iTunes libraries – which can be used in the calculation of Mahalanobis distances.

Equation 3.3: Distinctiveness score

$$u_i = \sum_{j \in C} \frac{b_j \, d_{ij}}{b}$$

As with presentation frequency scores, a context-specific distinctiveness of a composer u_{ip} can also be calculated by taking only some chosen subset of those broadcasts or curations p. Comparing values for u_{ip} against u_i can allow for more nuanced

consideration of how unfamiliar music is mediated to audiences on particular platforms.

Equation 3.4: Context-specific distinctiveness score

$$u_{ip} = \sum_{j \in C} \frac{b_{jp}\, d_{ij}}{b_p}$$

Large values for u_i indicate a composer whose music is highly esoteric in that the acoustic features of their music are unusual when compared against the music of composers most frequently included on that platform. Because the distance between a composer and themselves is zero, being programmed frequently (having a high value of f_i) will contribute to lowering a composer's distinctiveness score. In analysing the mediation of unfamiliar music, therefore, distinctiveness offers a useful global measure of familiarity of the musical content itself, irrespective of the capacity for name recognition of the individual composer.

3.3.5 Symbolic and economic capital of Australian composers

In addition to the biographical and familiarity measures of composers identified above, the mediation of familiarity of contemporary Australian art music can also be considered in terms of prestige. The role of media platforms in *contributing* to the symbolic and economic capital of composers has been touched upon above, however incorporating these measures into the content analysis also permits considering how these different forms of capital feature in the overall distribution of the composers being selected and curated. When contemporary Australian composers are selected, they may be drawn either predominantly from those who have achieved artistic and commercial success – and have correspondingly higher levels of familiarity – or they may seek to highlight the work of less acknowledged composers.

3.3.5.1 Symbolic capital

The notion of 'symbolic capital' can be conceived of as the accumulation of consecrated prestige which is specific to the nature of a particular field (Bourdieu, 1993, p. 75). In a field of restricted production, as is the case with contemporary Australian art music, it reflects the authority of recognised institutional actors to award value in accordance with the logic developed by the field itself and isolated

from economic concerns. Operationalising this concept for the full corpus of composers included in the content analysis was prohibitive; instead, the approach focusses just on the Australian composers featured in the sample. For each of these composers, four forms of honour and recognition were consulted:

1. the number of Australia Council[35] grants received between 2008-2018;
2. the value of Australia Council grants received between 2008-2018;
3. the number and level of prestige of commissions received over the composer's life; and
4. the number and level of prizes and awards received over the composer's life.

Data for components 1 and 2 were sourced directly from the Australia Council's published data on grants. For component 3, commissioning information for 6,857 works was extracted from the Australian Music Centre's database and each commissioning body given a weighting from 1 (soloists) through to 4 (major performing arts organisation, e.g. Sydney Symphony) to reflect their level of legitimacy in the field. Similarly, for component 4, information on 743 prizes and awards was extracted from the AMC's database and weightings given to both the award's issuing body (ranging from 1 (e.g. a state-based award) to 6 (e.g. a competitive international award)) and the placing received by the composer (ranging from 1 (e.g. Finalist) to 4 (e.g. Winner)). Scores for each of the four components were standardised to a common scale by converting them to z-scores, which express how many standard deviations each raw score is from a mean of zero. The final symbolic capital score for a composer was given by Equation 3.5, where Z_1, Z_2, Z_3 and Z_4 are the respective individual z-scores for the composer derived from each of the four components.

Equation 3.5: Symbolic capital

$$S_c = 0.25 \cdot Z_1 + 0.75 \cdot Z_2 + Z_3 + Z_4$$

[35] The Australia Council is the federal government's arts funding and advisory body. In the 2017-18 financial year it provided grants totalling $10.3 million to music (Australia Council for the Arts, 2018, p. 37).

As both Z_1 and Z_2 reflected aspects of legitimacy bestowed by government funding, their weightings were adjusted to from a single combined score, with greater precedence given to the value of grants relative to the number of grants received.

In total, 568 composers had a non-zero raw score across at least one of these four components and were able to be assigned an artistic prestige score. Aggregate Z-scores ranged from -0.66 to 23.96 with a mean of 1.55 and a median of 0.18. The distribution of scores is shown in Figure 3.2 below and demonstrates that it is heavily skewed towards lower values. This reflects a field which is dominated by a relatively small number of composers who have accumulated high levels of prestige, accompanied by a much larger range of less recognised artists who receive far less consecrated forms of recognition in the field. Table 3.3 lists the ten composers with the highest symbolic capital scores, all of whom are well established figures in the Australian art music scene. The most significant omission, Peter Sculthorpe, was ranked eleventh and reflects the score's emphasis on composers who are active and who also continue to seek government funding to support their activity.

Figure 3.2 Symbolic capital (artistic prestige) score distribution

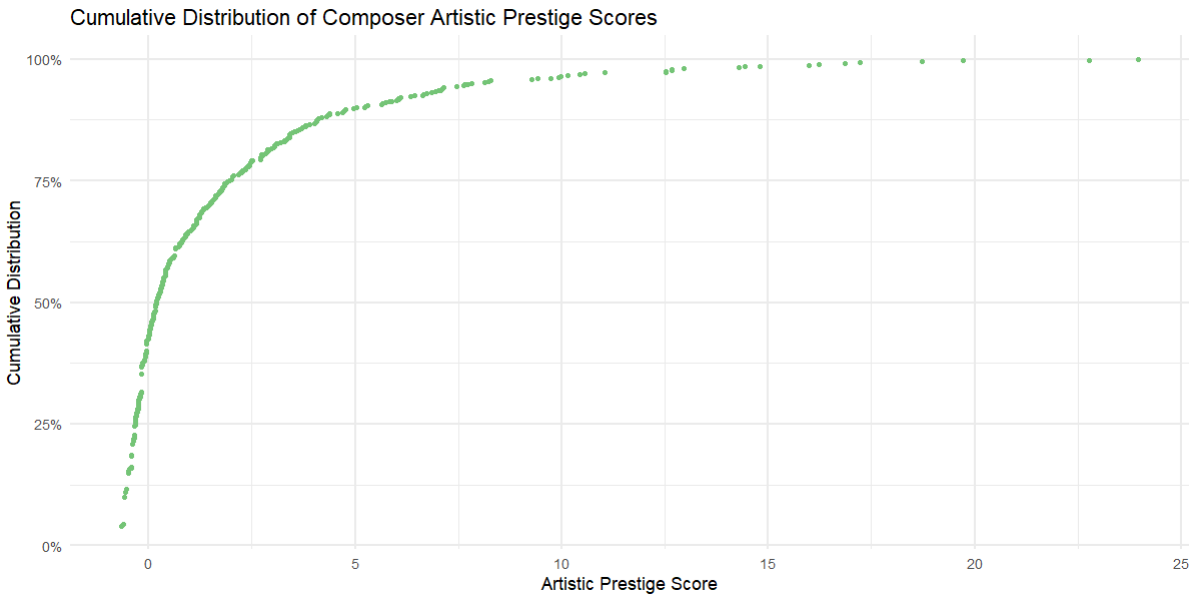


Table 3.3 Australian composers with highest level of symbolic capital

Composer	Symbolic Capital Score
Andrew Ford	23.96
Brett Dean	22.78
Elena Kats-Chernin	19.72
Andrew Schultz	18.73
Liza Lim	17.23
Carl Vine	16.85
Paul Stanhope	16.22
Ross Edwards	15.99
Matthew Hindson	14.79
Gordon Kerry	14.44

3.3.5.2 Economic capital

In contrast to field-specific symbolic capital, composers can also be assessed in terms of their accumulation of 'economic profits which await those who conform to laws of the economic universe' (Bourdieu, 1993, p. 75). The extent to which platforms may favour commercial or symbolic success is of interest to how they variously mediate the field of Australian art music. As with the approach to operationalising symbolic capital, the analysis limited its scope to include only those Australian composers included in the analysis. The challenge of accessing data on the commercial success of composers was resolved by selecting a proxy in the form of the performing right earnings derived from the usage of each composer's music in Australia. Specifically, the aggregate performing right earnings data was obtained from the Australasian Performing Right Association (APRA) for each composer in the period January 2013 through to June 2018.

Rather than measuring the overall economic capital of individuals, this measure focusses on one source of commercial earnings derived from their artistic practice. Given the income of Australian composers comes from their music, together with other arts-related income (such as teaching and administration) and also non-arts

income (Throsby & Hollister, 2003), the analytical focus requires isolating the commercial success of their *music*. The selected source is not without its limitations, however, such as failing to account for instances where a composer's music earns substantial income from other sources. While performing rights earnings reflect diverse income streams – including live, digital, radio and television – it will under-represent revenue from publishers (impacting only a very small number of composers) and commissioning fees (which are otherwise accounted for in measuring symbolic capital). Also, it is unable to distinguish between earnings derived from composers' art-music practice and their work in other genres. The latter means that the few composers who also happen to work in the financially lucrative areas of film, television and jingle song-writing have exponentially higher earnings. Finally, as the figures are from APRA, they are only able to reflect earnings derived from Australian usages of composers' works and penalise those whose work is primarily performed in other territories.

In total, performing right earnings were collected for 1,117 artists with earnings ranging from $0.01 through to $511,673.40 for the five-and-a-half-year period. While mean earnings were $5,945.07, the median was just $306.40, with the full distribution shown in Figure 3.3 below. While both symbolic and economic capital follow log-normal distributions among composers, the density estimates of each measure's z-scores in Figure 3.4 demonstrates that the former is substantially less skewed. This suggests that symbolic prestige encompasses more diverse sources of consecrating recognition from a multiplicity of micro-fields of artistic practice, compared to the singular dimension of financial earnings.

Figure 3.3 Composer earnings distribution

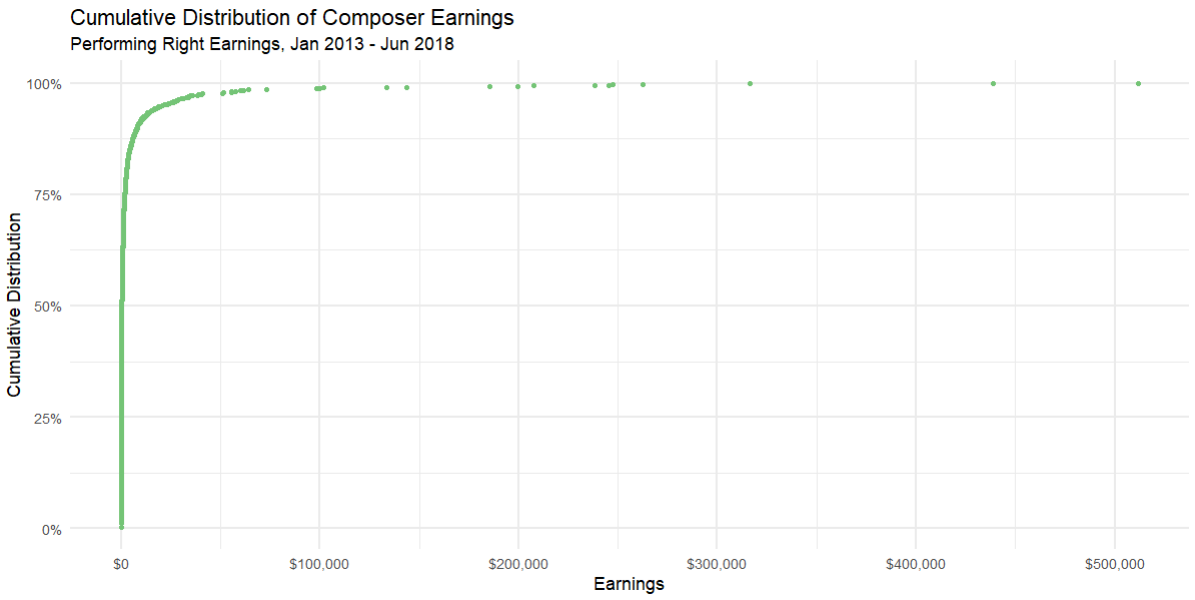
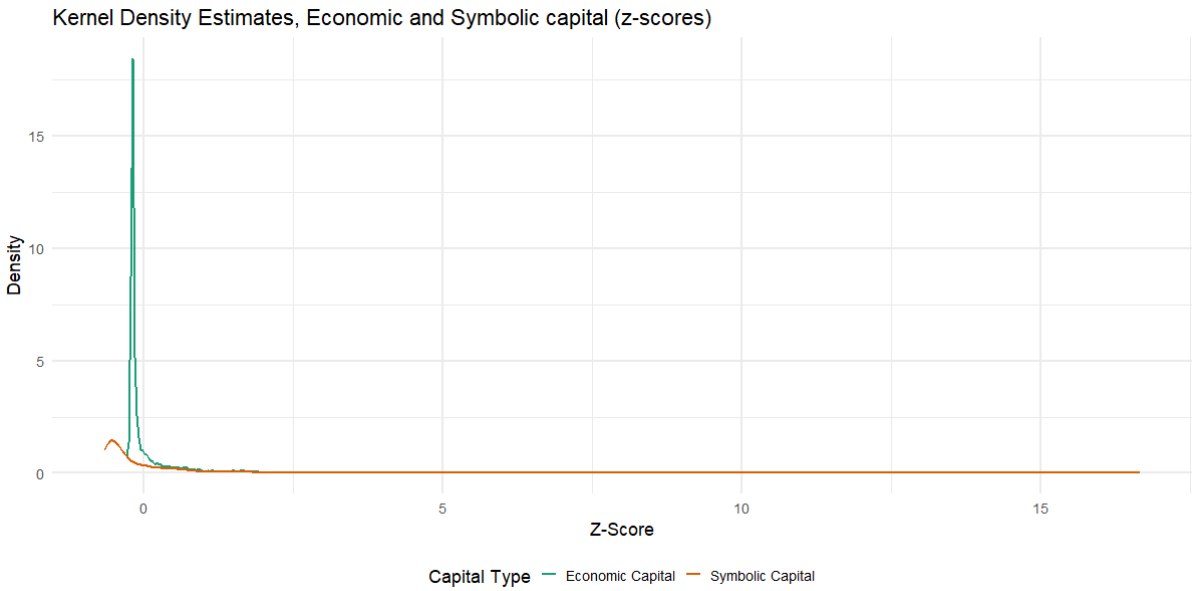


Figure 3.4 Density curves for symbolic and economic capital distribution



3.3.6 Data collection

3.3.6.1 Radio programming

To examine how music is mediated to audiences in the context of radio, data was compiled from over 21 years of broadcasts from the Australian Broadcasting Corporation's Classic FM network. ABC Classic FM, now rebranded as ABC Classic to denote its increasingly digital modes of broadcast, was chosen on the basis of it being Australia's only national radio network focussed on classical music. The network enjoys the largest audience reach of any classical focussed broadcaster, with an

average weekly reach of 736,000 listeners and an audience share of 2.8% across the five metropolitan cities for which radio audiences are measured (Sydney, Melbourne, Brisbane, Adelaide and Perth) (Australian Broadcasting Corporation, 2018, p. 63). While no metrics are regularly collected for regional audiences, Classic FM anecdotally enjoys strong listener numbers in regional Australia, where the number of competing broadcasters is smaller. This is borne out by occasional radio audience surveys in regional centres, in which Classic FM's audience share figures are regularly significantly higher than in crowded metropolitan radio markets (GfK, 2018).

To complement the content analysis data collected for this analysis, the researcher also obtained access to an online survey conducted by ABC Classic FM of its website users (n = 1,295) in February 2009. The survey featured 26 structured and three open-ended questions pertaining to demographics, listening preferences and technology usage. While the survey cannot be considered representative of all listeners, that 85.5% of respondents listen to the network 'every day or nearly everyday' (see Table 3.4 below) confirms the central role it plays in mediating the world of classical music for a significant section of its audience.

Table 3.4 How often do you listen to ABC Classic FM on the radio?
n = 1,291; response rate = 99.69%

Frequency	Count	Percent
Every day or nearly everyday	1,104	85.5%
A few times a week	109	8.4%
At least once a week	18	1.4%
Rarely or never	14	1.1%
At least once a fortnight	10	0.8%
At least once a month	5	0.4%
Less than once a month	2	0.2%
Other	29	2.2%

In addition to being regular listeners, ABC Classic FM audiences also display traditional preferences for works, composers and recordings which have been vetted

by the institutional arbiters of cultural taste. When asked to list the styles of music they listen to, Table 3.5 highlights the divide between traditional styles (baroque, romantic, choral, early music and opera) – all of which are listened to by over 50% of respondents – and contemporary forms (20th century, jazz, world, contemporary and experimental). When asked whether they would like to hear 'more', 'less', or 'about the same' amount of each style, it was only these latter four categories which had a higher proportion of respondents requesting it be given less airtime. This provides some context for the challenge of curating unfamiliar music among an audience which is frequently unsympathetic to being challenged in directions they have little time for. A taste of this hostility can be seen in the open-ended survey responses, two of which are included below.

Respondent#1: *If you are truly a CLASSIC MUSIC NETWORK then keep the music CLASSICAL. Stop airing this non music experimental noise CRAP. Stop trying to attract more listeners by alienating your base listeners by airing POPULAR non serious music. NO news, no jazz, no ethnic. no experimental garbage JUST CLASSICAL MUSIC !!!!!!!*

Respondent #2: *I know that you are obliged to play contemporary and experimental music, but surely there is another place for that on some other ABC radio stations. This is supposed to be an FM radio station for CLASSICAL MUSIC, not announcers lecturing us, and not for the other stuff which belongs in a junk yard.*

Table 3.5 Styles of music which are listened to by Classic FM website users

n = 1,285; response rate = 99.23%

Style	Count	Percent
Classical[36]	1,222	95.1%
Baroque	981	76.3%
Romantic	878	68.3%
Choral	791	61.6%
Early music	749	58.3%
Opera	745	58.0%
20th Century	538	41.9%
Jazz	538	41.9%
World	452	35.2%
Contemporary	354	27.5%
Experimental	153	11.9%
Other	80	6.2%

Of crucial importance to the current content analysis, Classic FM also has a strong history of detailing the works broadcast on the network through its publicly available Music Listings. Historical listings are no longer publicly accessible, however the researcher was able to obtain all raw published listings from 1 January 1996 through to 31 October 2018, comprising 916,906 discrete broadcasts of individual works. While comprehensive, the vast majority of raw data exists in an unstructured descriptive format, which reflects the absence of any data management system at Classic FM to maintain the consistency of entities such as composer or performer names, work titles or radio programs. Given the considerable efforts necessary to collect and clean the data to make it amenable to analysis, the resulting dataset has

[36] Rather than the specific historical era referenced elsewhere in this analysis, survey respondents likely interpreted this term as an alias for art music (as opposed to non-classical contemporary genres) – reflecting the categories of Baroque, Romantic, Choral, Early Music, Opera, and 20th Century.

been made publicly available to support replicating the research and further analysis (see Appendix D).

Table 3.6 summarises the different variables which were obtained for each unique broadcast of a work, together with the completeness with which each variable was able to be extracted. With the exception of duration, which was only documented for 86.58% of broadcasts, the table demonstrates the comprehensiveness of the data collected. The composer of each individual work forms the most salient variable used in the content analysis and a textual description of the composer's name was able to be extracted for 97.53% of all records. The process of matching these to an authoritative composer, as detailed in Section 3.3.1 above, was achieved for 95.16% of broadcasts with an identifiable composer (representing 92.81% of all broadcast data).

Table 3.6 Data completeness for broadcast-level variables

Variable	# Records	Proportion
Number of Broadcasts	916,906	100.00%
Date of Broadcast	916,906	100.00%
Time of Broadcast	916,851	99.99%
Duration	793,895	86.58%
Radio Program	916,906	100.00%
Broadcast Sequence[37]	916,906	100.00%
Identifiable Composer	894,304	97.53%
Matched to Authoritative Composer Term	850,979	92.81%

A total of 12,345 discrete authoritative composer terms were identified in the radio dataset, with Table 3.7 summarising the resulting coverage of different variables. The table shows the count and proportion of *composers* in the dataset which have a particular variable, together with the count and proportion of *broadcasts*. The latter

[37] Broadcast sequence refers to whether data exists on the ordering of an individual work in a particular radio program.

reflects the variability in how frequently works by each composer are broadcast. The low numbers for artistic prestige and commercial earnings data should be interpreted in light of the fact that collection of this data was limited to Australian composers.

Table 3.7 Data completeness for composer-level variables in broadcast data

Variable	# Composers	Proportion	# Broadcasts	Proportion
Date of Birth	8,110	65.69%	830,445	90.57%
Gender	9,414	76.26%	838,790	91.48%
Place of Activity	8,691	70.40%	834,443	91.01%
iTunes Artist Match	10,872	88.07%	839,838	91.59%
Spotify Artist Match	9,380	75.98%	826,289	90.12%
Acoustic Distance[38]	5,469	44.30%	714,393	77.91%
Artistic Prestige Score	406	3.29%	61,376	6.69%
Commercial Earnings	612	4.96%	77,851	8.49%

3.3.6.2 Concert programming

The mediation of art music by way of public concert programming was analysed based on a dataset obtained from the Australian Music Centre's (AMC) Calendar of Events[39]. This online concert listing features public concert information for events featuring at least one work by an Australian composer in the broadly interpreted genre categories of art music and contemporary jazz. The dataset can, therefore, be considered to provide comprehensive coverage of a subfield of the broader classical musical field encapsulated in the Classic FM broadcast data. Of the concert programs presented by the Sydney Symphony Orchestra, for example, only 11 of the 68 presented in 2018 (and 11 of 63 in 2017) would be eligible for inclusion in the AMC calendar. The omission of programs featuring only non-Australian works prevents placing Australian art music in the broader context of classical music's live presentation to audiences. Conversely, by drawing on a richer set of AMC data it

[38] This variable denotes whether there were sufficient iTunes or AMC recordings to allow the composer to be included in a dissimilarity matrix of acoustic distances as used in the calculation of distinctiveness (see Section 3.3.4).

[39] https://www.australianmusiccentre.com.au/calendar

permits examining other mediating factors such as the role of performers in selecting repertoire.

In total, data on 4,599 concert programs was sourced from the AMC Calendar, spanning the period 2009 to 2018. As the focus of analysis is on the programming itself, repeated presentations of the same concert on different dates, at potentially different venues, were excluded from the data. The dataset also excluded programs which only featured a single composer, as this was frequently an indication that data for those events was incomplete. The data includes 21,512 instances of composers being programmed and 2,548 unique performers presenting their music. Unlike the radio data, the AMC's documentation of individual events omits information on the duration of works by each composer, the number of works by each composer, and the sequencing order in which the works were presented.

To analyse the role of the performing ensemble or individual presenting each concert program, additional variables were appended to categorise both the size of the ensemble and the performer's overall repertoire focus. I assigned these variables manually to a subset of records chosen on the basis of the frequency with which each performer was featured in the dataset. Performer size was coded for 447 records using categories of Individual (with sub-types of Soloist, Composer-as-Performer and Accompanist), Small (2-4 players), Medium (5-11 players) and Large. The coding of repertoire focus sought to reflect the balance of repertoire across all programs presented by the ensemble (not limited to those included in the AMC Calendar of Events) and utilised categories of Heritage, Mixed and Contemporary. This coding required either substantial knowledge of the Australian art music scene and/or time to research the profiles of a large number of artists. Together with a professional working in the art music field, I independently coded the 154 most prolific performers in the dataset. This coding achieved an agreement rate of 95.5% and a Cohen's kappa coefficient of 0.93.

Table 3.8 below summarises the different data points derived for each unique composer (n = 3,560), showing both the number and proportion of unique composers together with the number and proportion of instances a composer has been programmed for which each composer-level variable is complete.

Table 3.8 Data completeness for composer-level variables in concert event data

Variable	# Composers	Proportion	# Programmed Composers[40]	Proportion
Date of Birth	2,588	72.70%	18,320	85.16%
Gender	3,132	87.98%	19,173	89.13%
Place of Activity	2,464	69.21%	18,099	84.13%
iTunes Artist Match	2,619	73.57%	17,783	82.67%
Spotify Artist Match	2,545	71.49%	17,248	80.18%
Acoustic Distance	790	22.19%	11,632	54.07%
Artistic Prestige Score	535	15.03%	7,572	35.20%
Commercial Earnings	928	26.07%	8,812	40.96%

Table 3.9 summarises the different data points derived for each performer (n = 2,548), showing both the number and proportion of unique performers together with the number and proportion of all performer-program (n = 7,082) combinations for which each performer-level variable is completed.

Table 3.9 Data completeness for performer-level variables in event data

Variable	# Performers	Proportion	# Events	Proportion
Gender	2,380	93.41%	6,815	96.23%
Performer Size	452	17.74%	3,399	47.99%
Repertoire Focus	154	6.04%	2,735	38.62%
Spotify Popularity	1,186	46.55%	4,281	60.45%

3.3.6.3 Spotify playlists

As the dominant digital music service with the largest subscriber base (Mulligan, 2019), Spotify is the obvious candidate for analysing the curation of digital playlists.

[40] This figure reflects the 'item-perspective' for concert events by counting the number of times a composer with the corresponding variable has been programmed at an event

Playlists can be curated by any individual or organisation with an account on Spotify and can be periodically updated or published as one-off static lists. Despite millions of playlists existing in Spotify's ecosystem, it is Spotify's own branded playlists which attract substantially higher numbers of subscribers and which are correspondingly more influential. The subscriber numbers in Table 3.10 below highlight the dominance of Spotify-curated playlists in the classical music category, with only one entry being curated by a third-party. Of the 9,178,556 subscribers to all classical playlists combined, 80.5% of those are subscriptions to Spotify-curated playlists.

Table 3.10 Top ranking classical playlists on Spotify (December 2018)

Rank	Curator	Title	Subscribers
1	Spotify	Classical Essentials	1,175,418
2	Spotify	Epic Classical	406,017
3	Spotify	Classical New Releases: Spotify Picks	381,898
4	Spotify	88 Keys	245,190
5	Spotify	Classical Romance	243,461
6	Spotify	Gentle Classical: From Dusk till Dawn	210,169
7	Spotify	Classical Lullabies	206,820
8	Spotify	Piano 100: Spotify Picks	198,797
9	Filtr UK	Relaxing Classical	198,017
10	Spotify	Top Classical of 2017	194,716

When comparing these numbers to the top performing playlists from a range of third-party curators listed in Table 3.11 below, the discrepancy in influence becomes even more pronounced. While playlists are promoted as the vehicle for artists to gain visibility and audiences in digital music services, it suggests there are only limited opportunities to promote the playlists themselves. The diversity of Bourdieu's 'cultural intermediaries' therefore becomes far more concentrated in a digital environment, where traditionally influential 'offline' institutions struggle to have a substantial voice. The most popular playlist published by ABC Classic FM, for example, has 2,052 subscribers while their 'Best of Australian Classical Music' attracts just 65. Even the

playlist listenership for a major classical music record label such as Naxos pales next to Spotify. Naxos's top-ranking 'Music for Book Lovers' enjoys only 0.3% of the listenership when compared to the top-ranked Spotify curated playlist in the classical genre.

Table 3.11 Top ranking classical Spotify playlists by various third-party curators

Curator	Title	Subscribers
Filtr UK	Relaxing Classical	198,017
Filtr Sweden	Classical Music for Reading	117,373
Unclassified	Need to Know: Vivaldi *	20,988
Peaceful Classics	Best Piano Music *	64,875
Deutsche Grammophon	Piano Masters	8,331
Sinfini	Opera Arias: Best Of *	4,800
NAXOS	Music for Book Lovers *	3,351
ABC Classics	Swoon: Music for Sheer Relaxation	2,052

** A one-off, static playlist list which is not regularly updated*

What is also evident from the titles of classical playlists is the tendency for them to serve particular niches, often premised on a highly functional role of music as helping listeners achieve a particular mental state, or providing an appropriate accompaniment to a primary activity such as reading, studying, exercising or hosting dinner. Such playlists closely reflect the sorts of functional, and often socially imbricated, uses of music which DeNora (2000) observed in her ethnographic study of how people use music in their everyday lives, and it represents a significant shift in consumption when contrasted with a critical and aesthetic sensibility which is the traditional guardian of value and merit in classical music. Significantly, it suggests a possible shift in classical music whereby the success of a curation is based not on its adherence to and deviation from any sort of canon, but instead on the extent to which it supports a narrowly defined functional requirement. The symbolic power of cultural capital hitherto vested in a canon, which is still evident in playlists such as those which focus on introducing and educating listeners to the 'great symphonies', is

brought into tension with a different model of consumption which eschews such symbolic trappings and places greater distance between the contexts of production and consumption. While familiarity can still be expected to play a role in this regard, it is anticipated to be different for the realm of 'functional' playlists which are amenable to being trained to identify candidate tracks through machine learning. The dimensions which underscore the distances which are meaningful in these functional contexts will likely introduce a significant gap to those distances which producers in the field regard as salient.

For the purposes of content analysis, the Spotify API was utilised to harvest all playlists listed in the category of 'classical', yielding 114 core playlists. These were supplemented by an additional 1,268 candidate playlists obtained by harvesting results from automated searches for classical playlists. Only actively refreshed playlists are of interest to the content analysis and a criterion of having been updated in the last month left 75 playlists which were assigned to a category as per the following table. The Christmas category was omitted from ongoing data collection due to its seasonal nature and the Composer Specific category was omitted due to it being unable to represent any variation in composers necessary for analysis. The remaining 49 playlists were harvested on a weekly basis over a five-month period between January and May 2019. A further 15 playlists were discarded during this period due to not being refreshed, resulting in a final list of 34 playlists comprising 43,337 entries of specific works/tracks on playlists.

Table 3.12 Categorisation of classical playlists on Spotify

Category	# Playlists	# Followers
General Classical Repertoire	14	401,480
Specialist Classical Repertoire (e.g. genre specific)	7	17,116
Task Specific (e.g. music for studying)	10	560,915
Mood Specific (e.g. melancholy)	6	302,397
Composer Specific	21	197,999
Instrument/Performer Specific	12	9,266
Christmas	5	4,427

Having the Spotify API as the source for the playlist data ensured that all playlist-entry level variables were complete. Rather than only having access to composer-level granularity, it also meant that work-specific data was available for analysis. Specifically, Spotify's track-level popularity score (assigned a value between 0 and 100) was included, resulting in the following list of playlist entry level variables being available for analysis:

- Date of playlist refresh
- Playlist name
- Playlist category
- Work (track) popularity score
- Playlist position/sequence

Table 3.13 summarises the different data points derived for each of the unique composers (n = 1,561) featured in the playlist data and their corresponding representation in the overall playlist-entry data (n = 43,337).

Table 3.13 Data completeness for composer-level variables in playlist data

Variable	# Composers	Proportion	# Playlist Entries	Proportion
Date of Birth	945	60.54%	33,262	76.75%
Gender	1,153	73.86%	38,705	89.31%
Place	919	58.87%	32,954	76.04%
iTunes Artist	1,254	80.33%	40,847	94.25%
Spotify Artist	1,219	99.36%	42,985	99.19%
Acoustic Distance	808	51.76%	32.638	75.31%
Artistic Prestige Score	68	4.36%	1,697	3.92%
Commercial Earnings	85	5.45%	2,035	4.70%

3.3.7 Summary

The content analysis detailed above has sought to compile a unique and comprehensive dataset pertaining to the mediation of music to audiences across radio, concerts and digital playlists. Through various transformations, the raw data

has been linked to authoritative sources to provide additional dimensions for analysis. These include both biographical elements of the composers – date of birth, gender, place of activity – together with approaches to operationalising *familiarity* with respect to the presentation frequency, popularity and distinctiveness of each of the composers. To permit particular scrutiny of Australian composers, data was also obtained on the artistic prestige and commercial success of each of these composers. Reflecting Bourdieu's primary opposition in fields of cultural production – between symbolic and economic capital – these measures are also proximal, perhaps tangential to notions of familiarity, and allow an analysis how different curatorial processes place varying emphasis on composers with different levels of renown.

The analysis techniques employed below include both descriptive statistics, coupled with linear and non-linear modelling to quantify the nature and strength of associations in the observed data. As the research is concerned with how curatorial processes intervene to shape the field's mediation to audiences, it also draws on Monte Carlo permutation techniques to identify how the *particular* representations of art music on individual platforms deviate from random programming. The visualisation of trends in data is also achieved by plotting the residuals of cross-tabulations, which allows for clearly contrasting variances in how content is curated and presented to audiences.

3.4 Results and analysis

The following analysis firstly considers how each platform curates its own particular representation of the field by selecting from the possibilities offered by the field of cultural production in art music. This is achieved by contrasting the balance of each platform's output with respect to historical era, nationality and gender. The longitudinal data collected for ABC Classic FM, together with an audience survey, permits further analysis of trends which have emerged over the past 20 years. The analysis then turns to how the platforms present unfamiliar music to audiences. Each of the three measure of familiarity – presentation frequency, popularity and distinctiveness – together with symbolic and economic capital, are individually reviewed, before then considering the degree to which they are interrelated. Beyond a platform's global profile of familiarity, the analysis then considers more specific

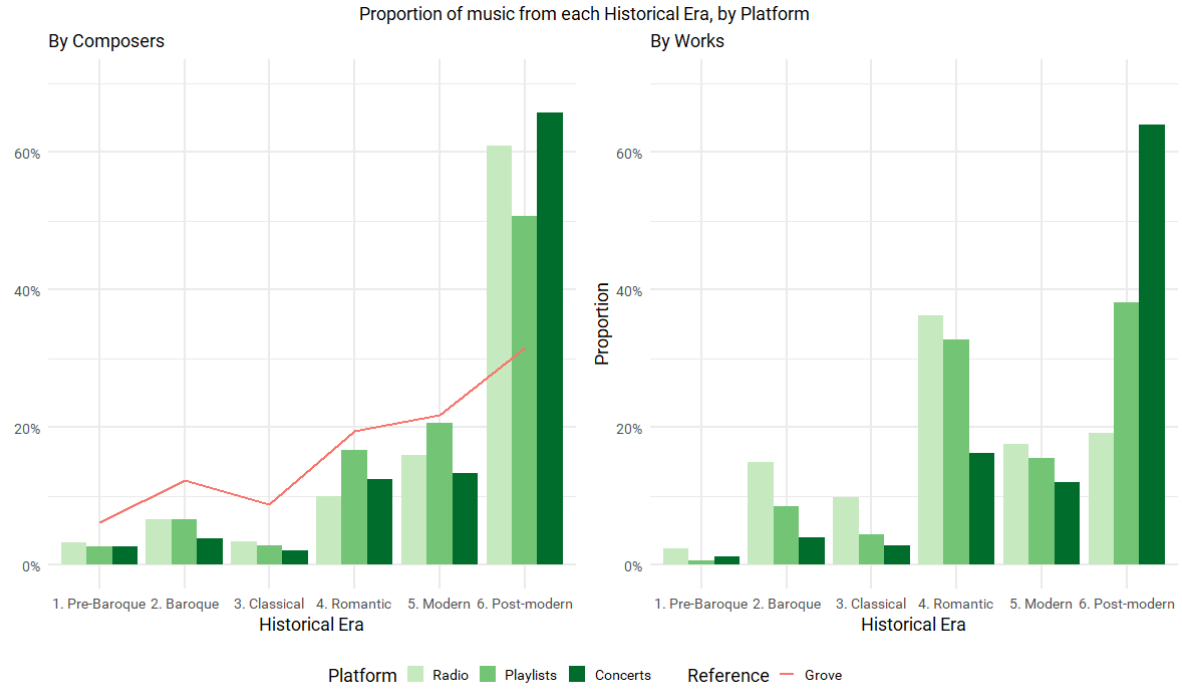
contexts in which unfamiliar music is more or less likely to be programmed. This firstly examines the variability among individual radio programs and digital playlists, together with the sequential continuum of works in which highly unfamiliar music is programmed. The analysis concludes by considering the role of *performers* in curating and presenting music. Focussing on live concert events, it examines how particular categories of performers play different roles in presenting the space of Australian art music composers to audiences.

3.4.1 Situating platforms in the field of art music production

Each of the platforms analysed in this chapter represents a diversity of musical practices, but the collective emphases within that diversity place each in a specific position relative to the broader field of art music. This can firstly be observed with respect to how the historical eras of Western art music are proportionally represented on each platform. Summary data for each platform is presented in Table 3.14, Table 3.15 and Table 3.16 below. A reference point for this comparison was obtained by consulting the historical era of composers featured with biographical articles in Grove Music Online[41] (n = 13,833). Figure 3.5 shows the distributions for each platform which result from the 'composer-perspective' (based on the number of unique composers) on the left and the 'item-perspective' (based on the frequency of works) on the right. The distribution observed in the Grove reference point is overlayed on the composer-perspective graph as a red line.

[41] As the digital incarnation of *Grove's Dictionary of Music and Musicians*, Grove Online represents an authoritative reference on Western music. In determining the distribution of composers by historical era, the current analysis consulted all entries with a biographical article and an occupation of 'Composer or Arranger'.

Figure 3.5 Proportional representation of historical eras on different platforms



With the exception of the relatively small time frame of the Classical era, Grove otherwise shows the number of discrete composers to be increasing as the historical eras progress and reflects the capacity for an increased number of composers to gain prominence in modern society. In terms of the composer-perspective distributions on the three platforms, the most notable observation is the consistent over-representation of post-modern era composers. Instead of relying on the established canon, all platforms draw extensively from the diversity of contemporary composers. In terms of familiarity, the post-modern era is associated with greater heterogeneity of sounds and the curation of proportionally high numbers of these composers suggests that audiences are being exposed to a diversity of musical styles.

It is also interesting to observe that this trend towards the post-modern era in the composer-perspective data is most pronounced for concerts and radio. Playlists most closely follow the distribution of composers in Grove – representing the consecrated understanding of the Western art music field – whereas the other platforms place more emphasis on curating a larger number of contemporary composers. This is unsurprising for concerts, given the dataset's emphasis on contemporary Australian composers, whereas the abundance in radio can be understood in terms of the charter which governs the functions of the ABC more generally. This includes a specific

provision “to encourage and promote the musical, dramatic and other performing arts in Australia” (*Australian Broadcasting Corporation Act 1983*, Cth, s. 6 (1) (c)). As a result, a relatively large number of Australian composers are broadcast on ABC Classic FM, the vast majority of which will sit within the post-modern historical era.

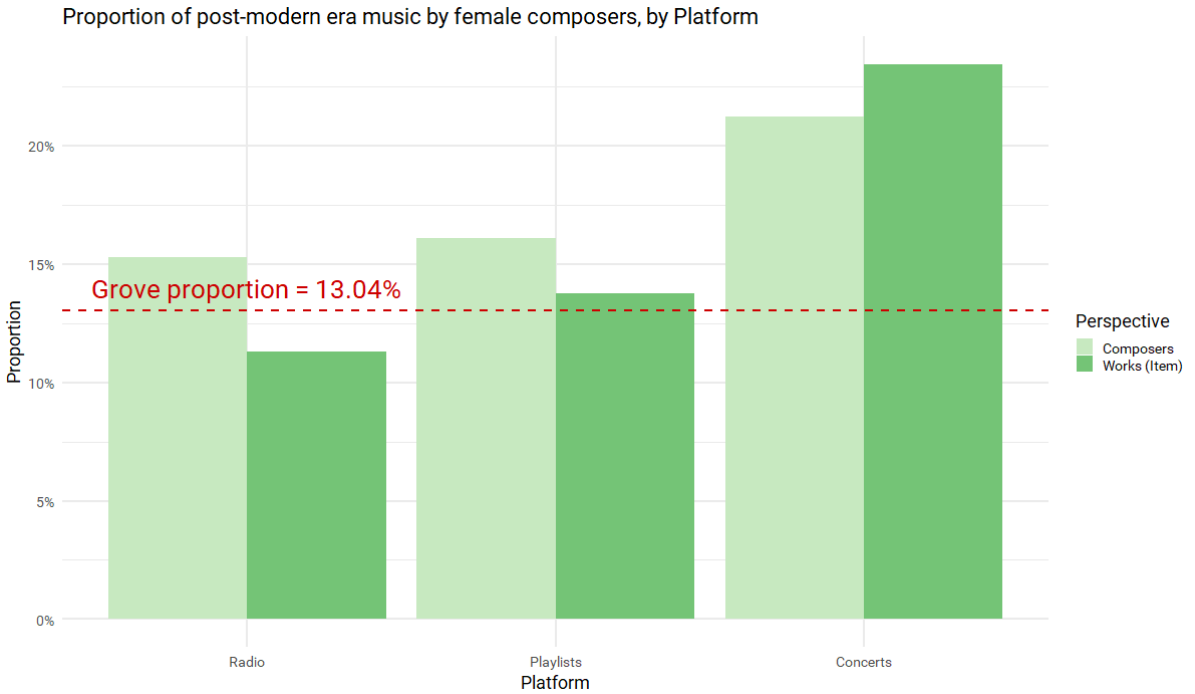
When the frequency with which different composers are curated is taken into account, as shown in the graph on the right-hand side, both radio and playlists produce markedly different representations of the field. While 61% of composers featured on ABC Classic FM are from the post-modern era, they represent only 19% of works broadcast. This gap is even more pronounced when assessed in terms of the *duration* of works broadcast, whereby only 14% of music heard is from the post-modern era (see Table 3.14). A similar, though far less pronounced, trend can be observed in playlists, which also exhibits less propensity than radio programming to present music from before the Romantic era. By contrast, concert programming is notable for its consistency in the two graphs. Not only do the sampled concerts present the highest diversity of post-modern era composers, but they are also programmed with equal abundance.

The implications of the gaps between the composer and item perspectives are significant, as they point to how the heterogeneous world of post-modern era music is both promoted and undermined. The profusion of competing contemporary voices vying for curatorial attention does result in a disproportionately higher number of composers being featured on both radio and playlists. The sum of their parts, however, does not add up to an effective representation of this era of music. Instead, it is the more conservative – and familiar – sounds of the Romantic era, followed by the Modern, Baroque and Classical eras, which are more likely to be heard on these platforms. This points to curatorial processes which select from a wide array of contemporary composers, but which are more reluctant to feature them frequently. While both radio and playlists follow this trend, the latter shows itself to be far more likely to embrace contemporary artists. At 38%, post-modern era works are not only the most frequently era programmed on Spotify playlists, but this figure is double the rate found on radio.

3.4.1.1 Gender and nationality in the curation of post-modern era music

The post-modern era music featured on each platform can be further scrutinised in terms of the gender and nationality of composers. Figure 3.6 shows the proportion of music on each platform by female composers, showing both the composer and item-level perspectives. The proportion of post-modern era composers listed in Grove which are female is overlayed in red at 13.04%. The under-representation of female composers has been a recurring point of critique in art music more generally and the data suggests the three platforms lie on a continuum of how their curatorial processes respond to this imbalance. Concert programming is clearly the most successful in addressing gender equity, with 23.4% of composers featured in programs being female. This figure drops significantly to 13.8% for digital playlists and just 11.3% for radio. While the unique composers featured on radio surpasses the Grove reference point, its curatorial processes of selection are notable for more frequently featuring the music of male composers and suggests an underlying conservatism in the particular radio network studied.

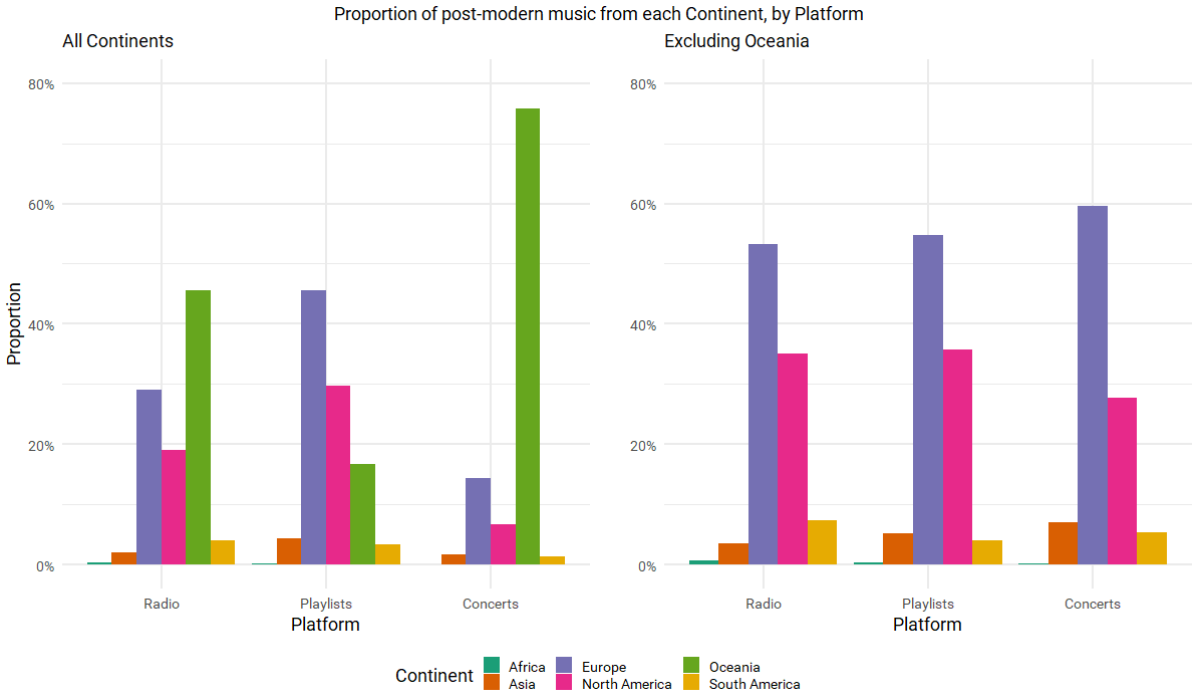
Figure 3.6 Female-composed music in the post-modern era



In addition to gender, it is of interest to examine the geographic profile of the post-modern era music presented on the three platforms. Figure 3.7 shows the item-perspective distribution of works based on the continent where each composer was

predominantly active. The left-hand side shows all six continents, whereas the right-hand side removes the skews introduced by Australian composers (Oceania) to ease comparison among the remaining continents. Concerts show an overwhelming skew towards Oceania, however this should be interpreted in light of the data collection approach which mandated the inclusion of at least one work by an Australian composer. Even so, it demonstrates the significance of this form of presentation for championing (almost exclusively) Australian contemporary works. The role of the ABC's charter becomes evident in contrasting radio and playlists, with Oceania composers responsible for 45.6% of works compared to just 16.8% for playlists. This suggests significant consequences for the visibility of domestic repertoires as younger audiences shift from radio to digital platforms.

Figure 3.7 Geographic spread of post-modern era music



Once the Oceania content is removed, the right-hand graph shows the residual geographic profiles of all three platforms as remarkably similar. The European tradition in art music dominates, followed by North America, with non-Western demographics only attracting minimal representation. Interestingly, it is among concert programs – in which Australian composers have the strongest presence, that the European influence is at its strongest and suggests a closer affinity among the

Australian art music community with these traditions as opposed to their North American counterparts.

3.4.1.2 ABC Classic FM historical trends

The comprehensive longitudinal data collected for ABC Classic FM's radio broadcasts also allows an examination of how its representation of art music has shifted over time. Figure 3.8 shows the proportion of music from each historical era in terms of both the number of works broadcast (left) and total duration of works broadcast (right). Most notable is the increase in the proportion of post-modern music between 2000-2004. Overall, it shows a picture of a continued resilience of Romantic era music, whose 'shoulder' eras of Classical and Modern are experiencing declines as curators replace them with the more historical extremes of Post-modern and Baroque music. With respect to Australian composers within the postmodern era (Figure 3.9), from 2006 onwards, there is a substantial increase in the proportion of Australian composed music on Classic FM. This trend coincides with the establishment of an Australian Music Curator position within the network and demonstrates the capacity of curatorial decision-making to impact the musical profile of a network.

Figure 3.8 Classic FM trends 1997-2017, by historical era

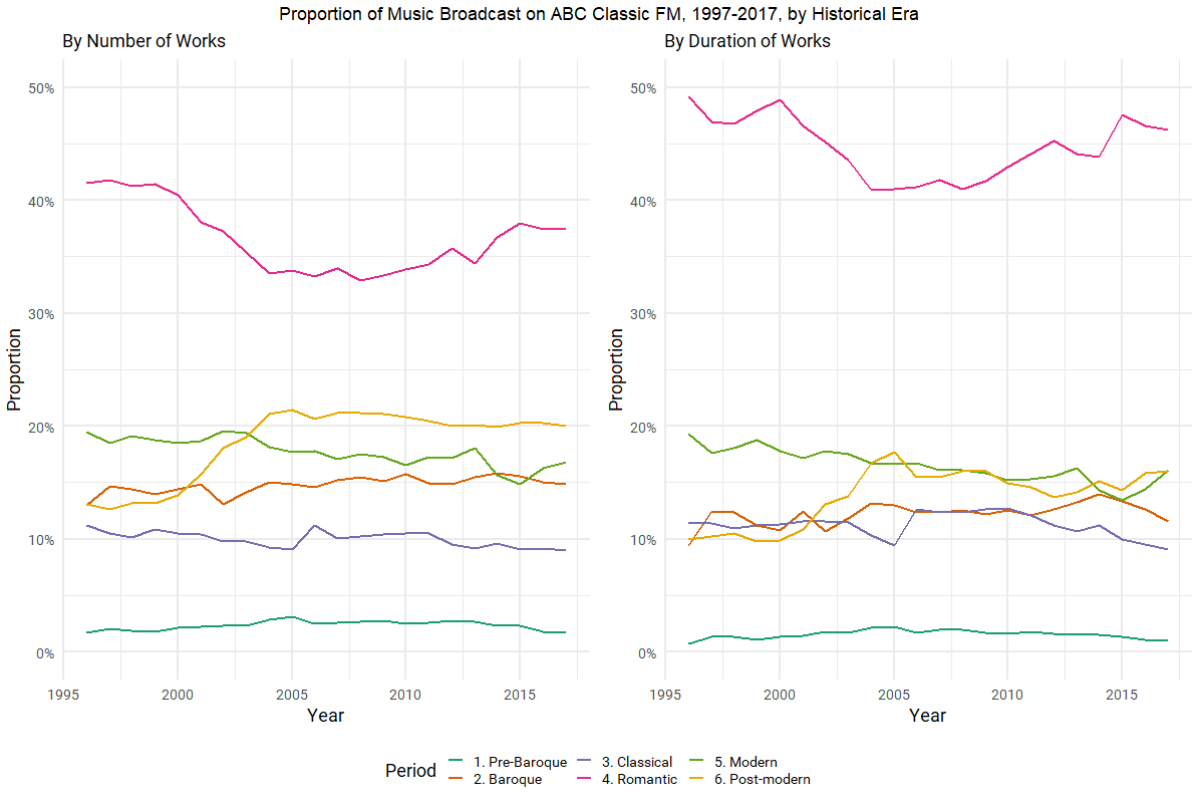


Figure 3.9 Classic FM trends 1997-2018, representation of Australian composers

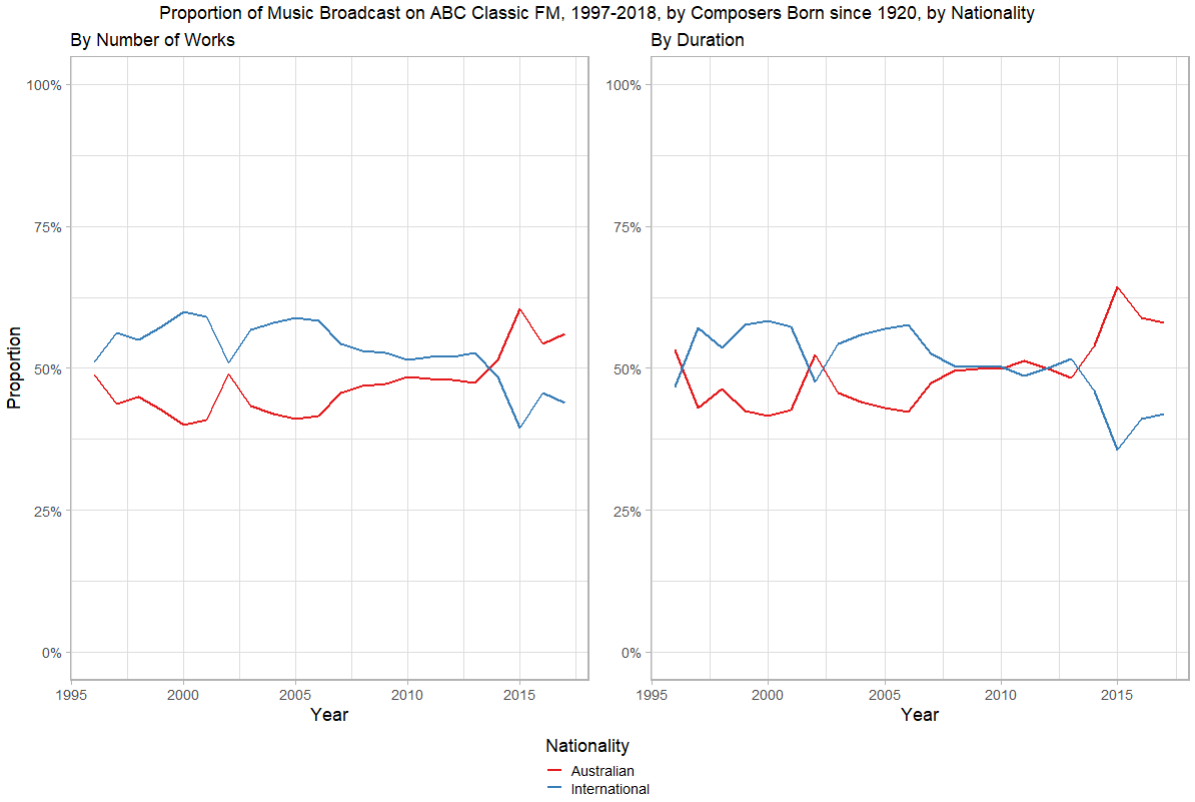


Table 3.14 Distribution of historical eras in Classic FM broadcast data, 1996-2018

Historical Era	# Broadcasts	# Composers	Total Duration (seconds)	% Broadcasts	% Duration	% Composers	Avg. Broadcasts Per Composer
1. Pre-Baroque	19,478	265	6,645,595	2.3%	1.6%	3.3%	73.5
2. Baroque	123,361	533	52,730,037	14.9%	12.4%	6.6%	231.4
3. Classical	81,723	272	47,644,204	9.8%	11.2%	3.4%	300.5
4. Romantic	301,401	808	189,652,661	36.3%	44.5%	10.0%	373.0
5. Modern	145,850	1,290	69,169,462	17.6%	16.2%	15.9%	113.1
6. Post-modern	158,632	4,939	60,265,751	19.1%	14.1%	60.9%	32.1

Table 3.15 Distribution of historical eras in Spotify playlist data

Historical Era	# Playlist Entries	# Composers	Total Duration (seconds)	% Playlist Entries	% Duration	% Composers	Avg. Playlist Entries Per Composer
1. Pre-Baroque	201	25	50,949	0.6%	0.6%	2.6%	8.0
2. Baroque	2,834	62	646,859	8.5%	7.2%	6.6%	45.7
3. Classical	1,488	27	466,917	4.5%	5.2%	2.9%	55.1
4. Romantic	10,874	157	3,156,474	32.7%	35.3%	16.6%	69.3
5. Modern	5,159	195	1,455,450	15.5%	16.3%	20.6%	26.5
6. Post-modern	12,706	479	3,159,555	38.2%	35.4%	50.7%	26.5

Table 3.16 Distribution of historical eras in concert event data

Historical Era	# Concert Programs	# Composers	% Concert Programs	% Composers	Avg. Concerts Per Composer
1. Pre-Baroque	209	54	1.14%	2.15%	3.87
2. Baroque	716	85	3.91%	3.38%	8.42
3. Classical	525	30	2.87%	1.19%	17.5
4. Romantic	2,961	210	16.18%	8.35%	14.1
5. Modern	2,194	286	11.99%	11.37%	7.67
6. Post-modern	11,691	1,851	63.9%	73.57%	6.32

3.4.2 Presentation frequency as familiarity

The frequency with which different composers are broadcast on a particular platform, together with the relative distributions of those frequencies, provides the initial starting point from which to analyse how familiarity is curated across radio, concerts and playlists. For all platforms, composer frequency follows a log-normal distribution with median values significantly lower than their respective means. This reflects the preponderance of composers who only enjoy very limited exposure on each platform and whose *individual* musical style is therefore more likely to be unfamiliar to audiences. Table 3.17 displays summary statistics for each platform. The variation in the number of items included in each dataset make direct comparison difficult. Instead, the variance between platforms is presented visually in Figure 3.10, which plots the cumulative percentile of composer frequency against that cumulative percentile's corresponding contribution to the overall output of each platform. It can be interpreted as showing, for instance, that the 62.5% least frequently featured composers on playlists are responsible for approximately 12.5% of all playlist content.

Table 3.17 Presentation frequency distribution statistics

Platform	Items (Works)	Composers	Mean	Median	SD
Radio	850,979	12,345	68.93	4	656.78
Concerts	19,787	4,227	4.68	1	15.13
Playlists	43,337	1,561	27.76	10	71.99

Figure 3.10 Composer presentation frequency, cumulative frequency distribution

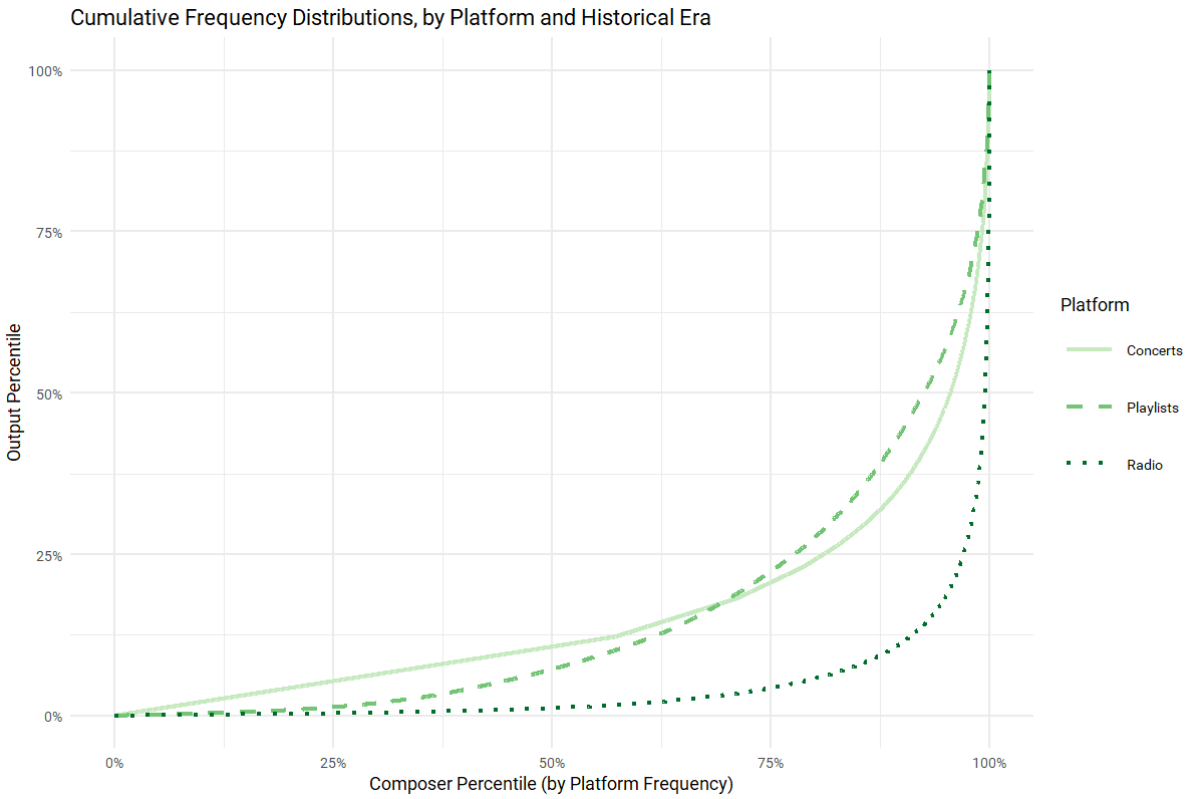
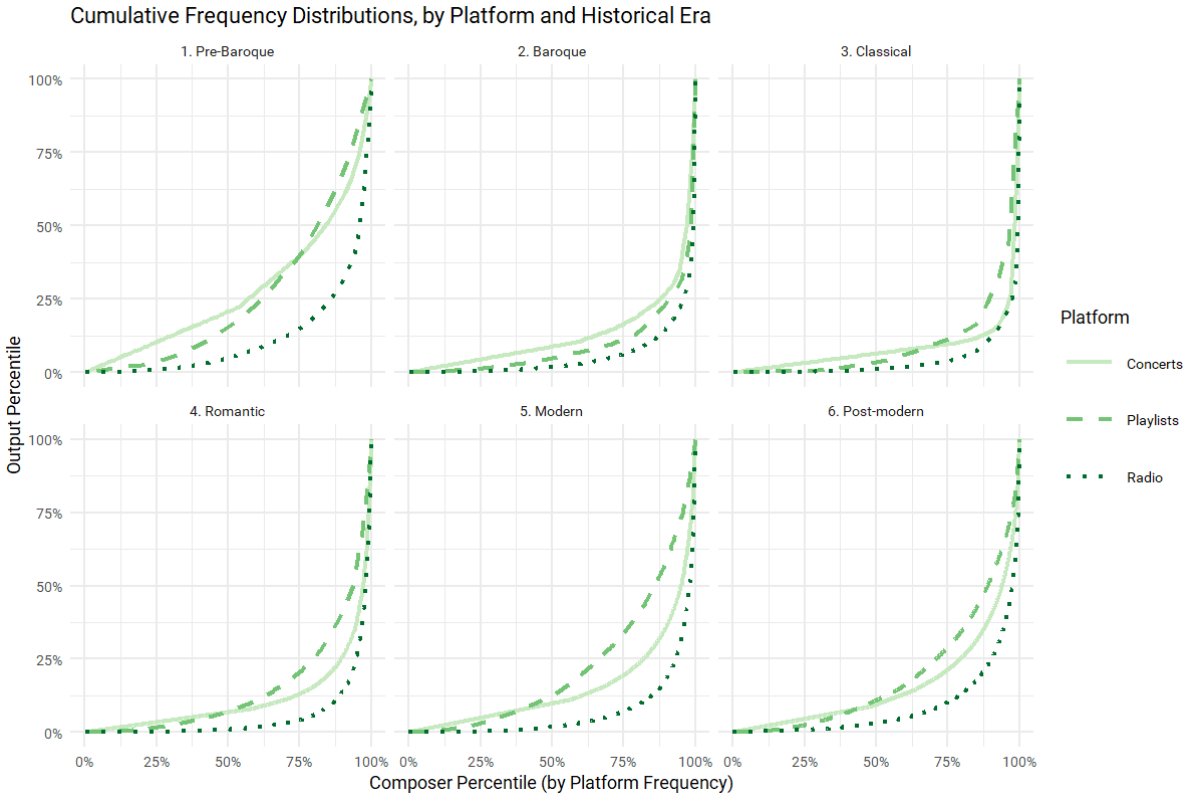


Figure 3.11 Composer presentation frequency, cumulative frequency distribution, by historical era



The frequency profile of ABC Classic FM shows it to be the platform which is most unbalanced in terms of familiarity. The top 5% of composers are responsible for 81.4% of all broadcasts, which points to curatorial processes which lean heavily on a small coterie of high rotation composers (such as Mozart, Bach, Beethoven and Schubert) who can be relied upon to be familiar to audiences. Both playlists and concerts show somewhat more linear distributions than ABC Classic FM. High rotation composers continue to dominate, but less prominent composers make up significantly more of the content broadcast. An important distinction between concerts and playlists, however, arises in the diversity of composers who are present in live concert programming. The sample analysed includes over twice as much playlist data as concerts, but playlists only include 37% as many distinct composers. Concerts are much more likely to introduce audiences to unfamiliar composers whom they do not encounter elsewhere. Obtaining a presence on Spotify playlists, conversely, will result in a higher minimum exposure.

As shown in Figure 3.11, presentation frequency can also be shown to vary significantly by historical era. In each of the historical extremes, Pre-Baroque and Post-modern, individual composers are featured, on average, less frequently but they also follow distributions which are more linear in shape and less skewed by high frequency composers. As discussed previously, this pattern can be understood for the post-modern era in the context of heritage composers having been subjected to established systems of curation, without the disruption of new entrants, and thereby providing a stable cohort of composers with orders of legitimacy well established through the accumulation of recordings and concert performances. The field of contemporary practice, by contrast, reflects a multiplicity of voices striving to establish themselves in a crowded space of musical artists and composers. Counterintuitively, Pre-Baroque music can also be understood in these terms: it is musicologists, performers and curators ‘discovering’ and promoting music of an era which was hitherto largely unknown. This points to time having a more dynamic relationship to the field than one which is a simply linear process of canonisation.

3.4.3 Popularity as familiarity

Whereas presentation frequency allows examining familiarity in terms of the exposure of composers on each platform, it is limited in assuming that a low frequency composer will be unfamiliar to a listener. Using a measure of popularity, conversely, permits analysing the degree to which different platforms favour composers who not only have greater renown, but whom audiences frequently listen to. The use of Spotify's artist popularity metric in the subsequent analysis skews this notion of popularity to users of that particular platform, but also allows a much more exhaustive coverage of content's popularity than would otherwise be possible.

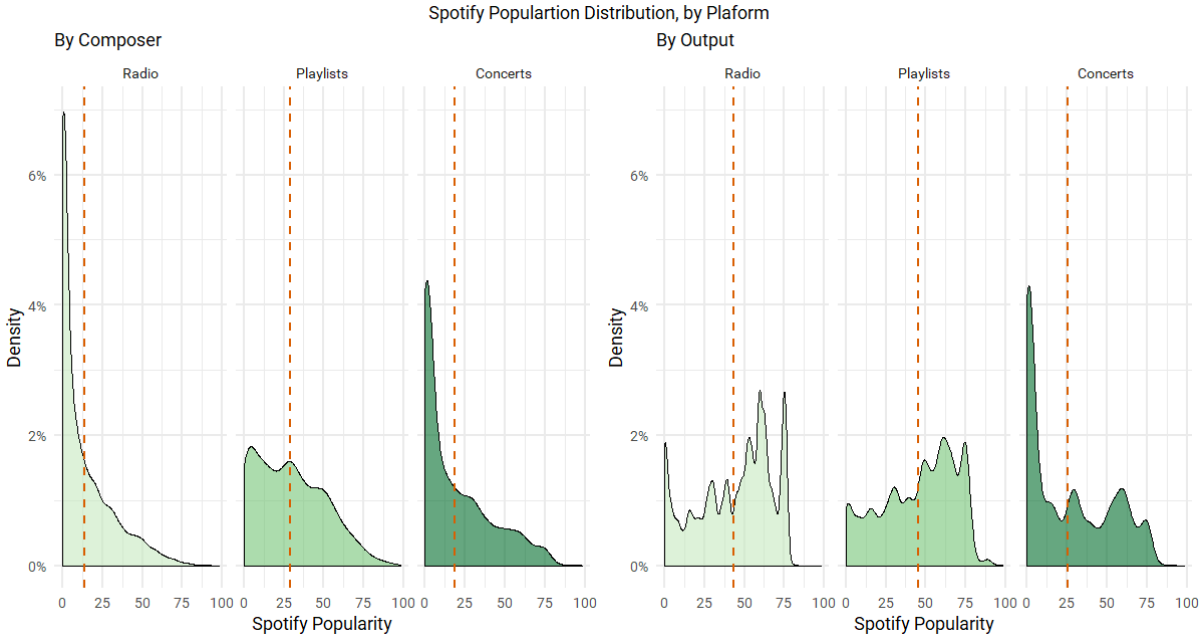
Summary popularity statistics for the composer and item perspectives on each platform are listed in Table 3.18 below, with a visual representation of these distributions shown using density plots[42] in Figure 3.12. Viewed from the perspective of unique composers featured on each platform, all three platforms show mean values substantially higher than the mean of 3.48 for Spotify artists across all genres. While a degree of popularity is therefore a concern for all modes of curation, a continuum exists ranging from a heavy right skew favouring low popularity composers on radio, through to a much more balanced distribution in the playlist data. With a median popularity score of just six, radio demonstrates curatorial processes which seek to provide exposure for the works of lesser known artists. Concerts reflect this trend in a more moderated manner, possibly reflecting the greater ease with which the music of obscure composers can be broadcast as opposed to presented in a live concert context. Playlists, however are much less likely to draw upon low-popularity composers. This can partly be interpreted as self-fulfilling – the popularity measure is taken from Spotify, and composers who appear in Spotify playlists will likely become more popular. This influence was moderated by using popularity scores of artists *before* their inclusion in the analysed playlist data. As such, the comparatively higher mean and median scores for playlists largely reflects that platform's curatorial preference for high popularity composers.

[42] Unlike the previous analysis of presentation frequency as familiarity, which involved comparing different scales of frequency and therefore visualised distributions using cumulative frequency distribution plots, the density plots able to be used here provide a richer picture of the shape of distributions.

Table 3.18 Popularity distribution statistics

Platform	Composer Mean	Composer Median	Output Mean	Output Median
Radio	13.60	6	43.66	49
Playlists	28.92	27	45.23	49
Concerts	18.51	10	25.69	17

Figure 3.12 Popularity score density plots, dashed red lines indicate mean scores

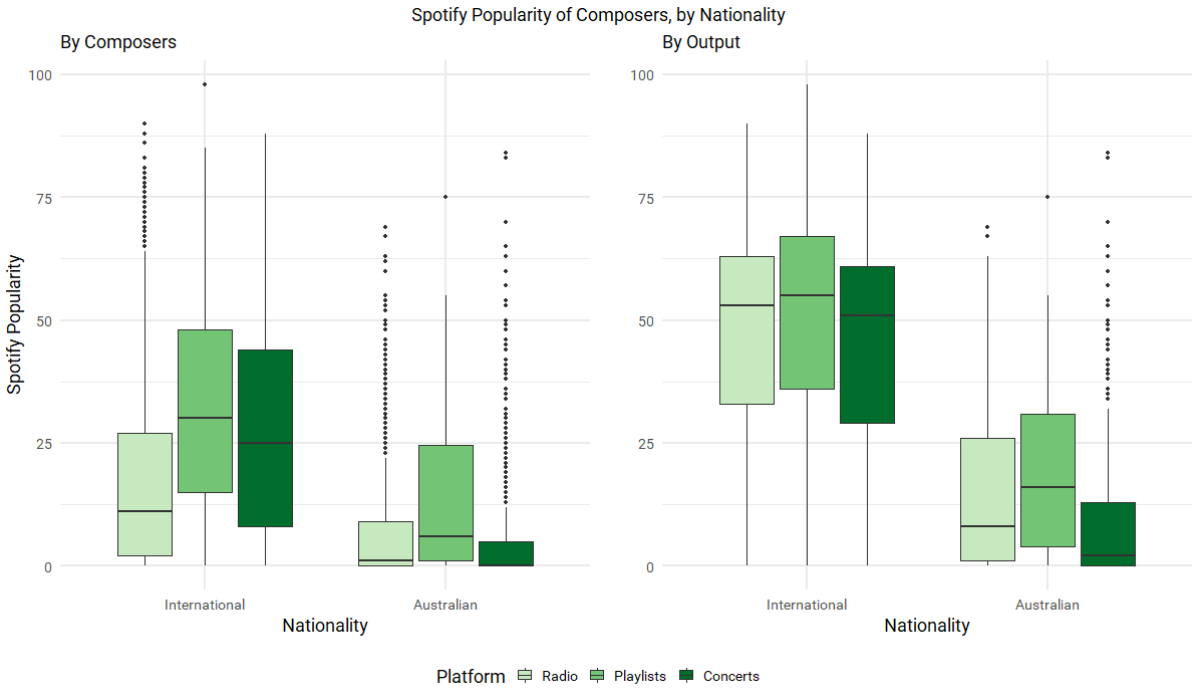


The density plots implement kernel density estimates from the ggplot2 (Wickham, 2016) package, which represents a smoothed version of a histogram. Dashed red lines indicate mean scores.

The item-perspective density plots, however, show that the frequency with which different composers are broadcast heavily favours high popularity artists. The output of radio is brought into much closer alignment with playlists, with concert programming being the platform where audiences are more likely to encounter less appreciated works. Whereas radio and playlists are sensitive to audiences who can change stations or skip to another track, concert programming enjoys a captive audience and room to provide greater discursive introduction to esoteric composers and their work.

Within the overall platform popularity distributions, a significant cleavage can be observed between the popularity of Australian composers and their international counterparts. As shown in boxplots for just post-modern era composers in Figure 3.13, median popularity scores across all platforms are lower for Australian composers. Examining the output perspective on the right-hand side of the figure, all platforms preference higher popularity Australian composers, however the shift in median popularity from the composer perspective is much more pronounced for the playlist data. While the average popularity of curated Australian composers could be expected to be lower than their international counterparts – particularly as measured by a global digital music service – it is nevertheless salient to observe the extent to which Spotify favours more popular Australian composers. Audiences wishing to hear the more niche areas of contemporary Australian art music are much more likely to do so through live concerts and, to a lesser extent, radio.

Figure 3.13 Popularity by nationality



3.4.3.1 Radio

Analysing the popularity of items within the radio dataset, it is surprising to observe the disjuncture between the antipathy previously seen among ABC Classic FM website users towards contemporary styles and the apparent popularity of this era's music among Spotify's users. Among all composers broadcast on ABC Classic FM, the group

mean popularity score is highest for those who fall into the post-modern era. This result is likely to have been bolstered by two factors: firstly, the occasional broadcast of 'popular' composers and songwriters from outside the classical canon, and who are likely antithetical to the interests of ABC Classic FM's listenership. Secondly, and to a lesser extent, it is attributable to the fact that a greater proportion of composers in the post-modern era do not have corresponding Spotify artist accounts (15.9% as opposed to an average of 13.7% for other eras). An absence of an account suggests a low popularity, yet this absence is effectively omitted in calculating group means.

To adjust for these factors, an adjusted dataset was created which both omits composers with less than 50 broadcasts and applies a popularity score of zero to those composers with no corresponding Spotify artist account. The boxplots in Figure 3.14 show the distribution of popularity scores for composers in the radio dataset, by historical era, with both the raw and adjusted bases for conducting the analysis. Omitting low frequency composers significantly raises the mean popularity scores for all eras and elevates the Romantic era as having the highest mean composer popularity (23.4); the Post-modern era retains a high mean popularity, however it also has the largest range of scores falling between the first and third quartiles. The different distributions by historical era are shown in Figure 3.15 and emphasise how post-modern era composers have relatively higher distributions at both the lower and upper ends of the popularity spectrum.

Figure 3.14 Spotify popularity of composers, by historical era

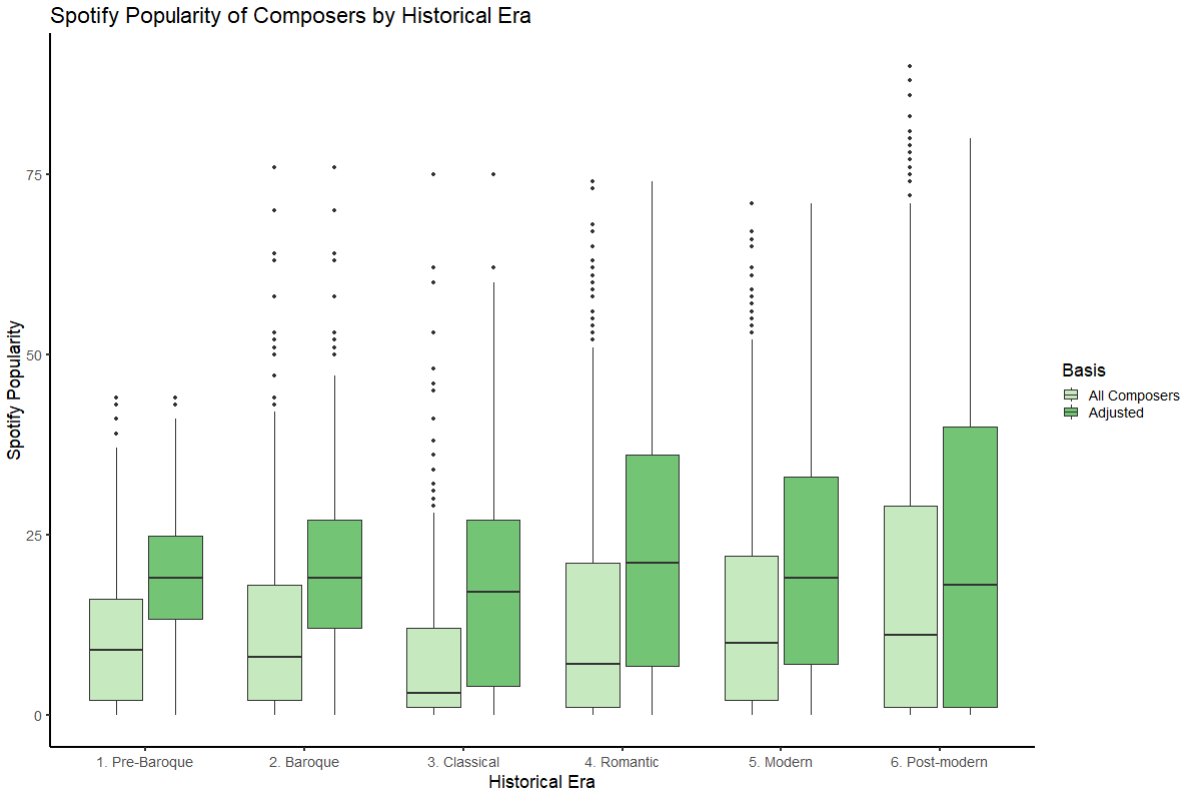


Figure 3.15 Distribution of composer Spotify popularity scores, by historical era (radio)

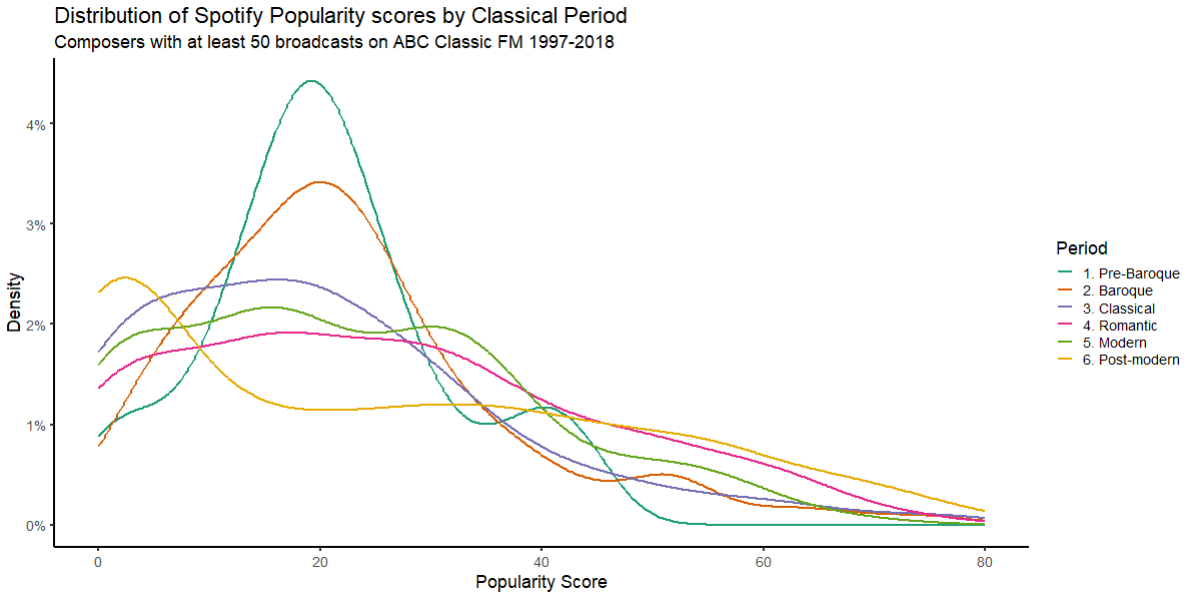
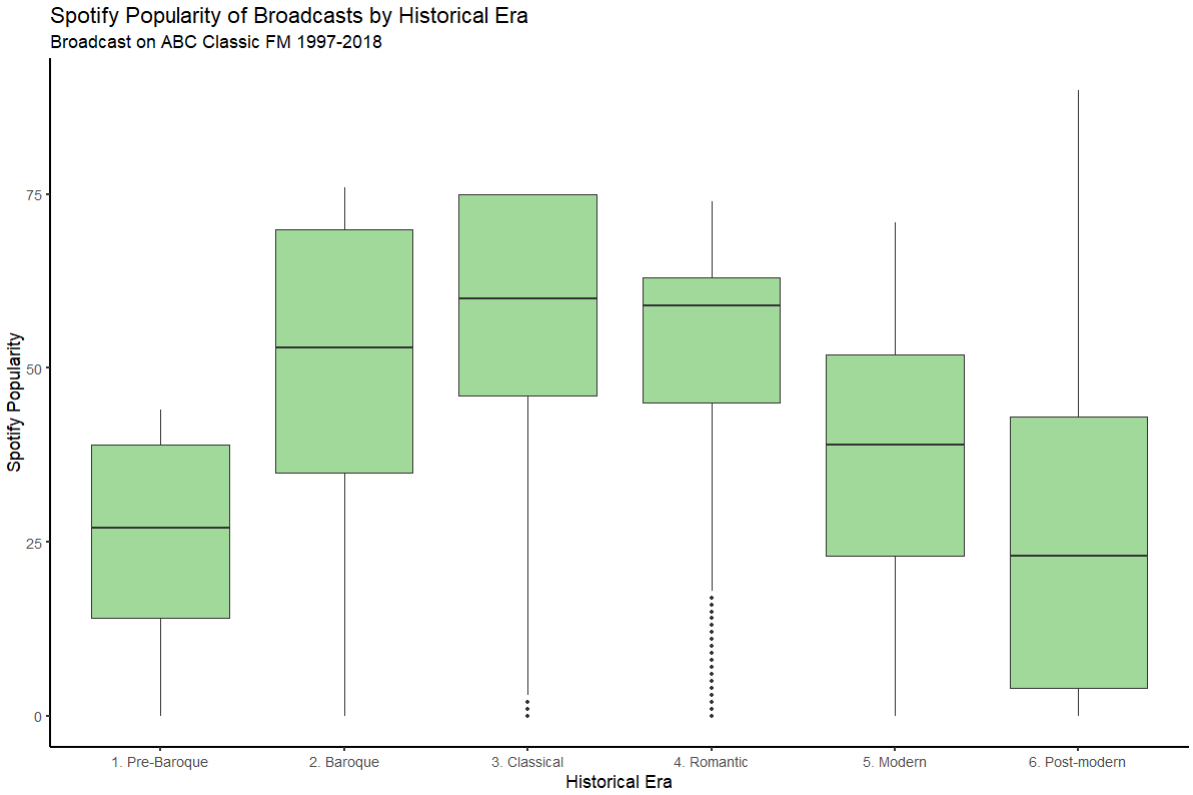


Figure 3.16 Spotify popularity of broadcasts, by historical era



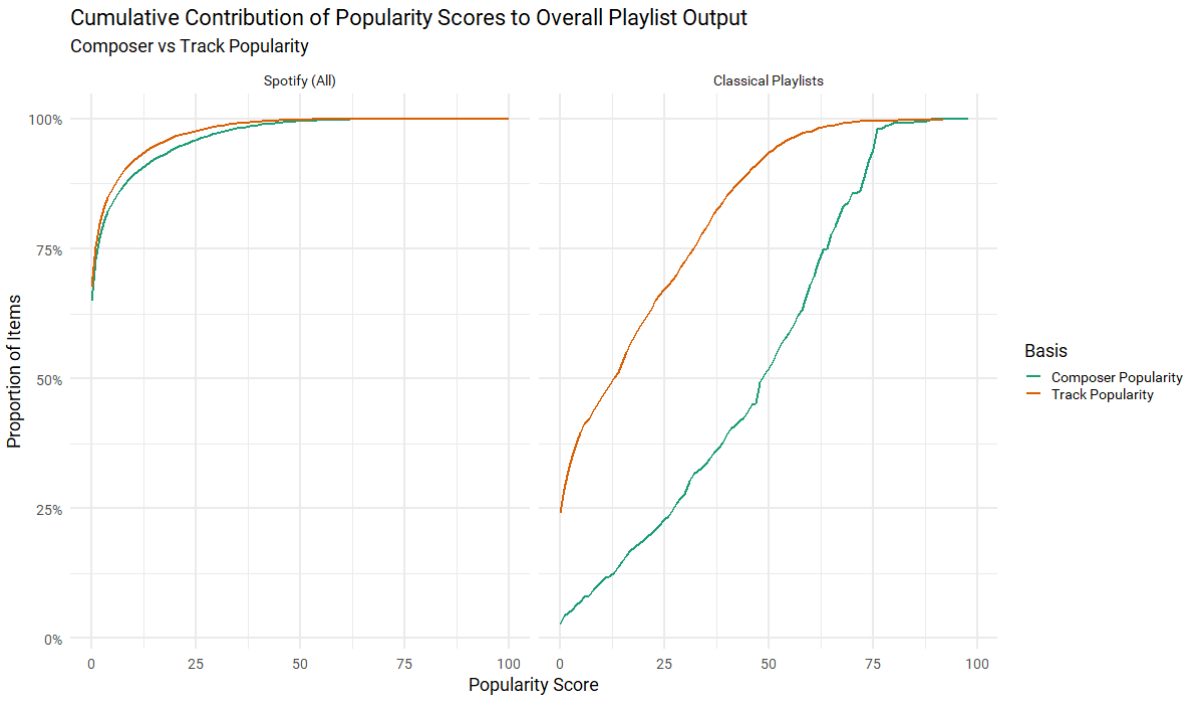
The composer perspective data above do, nevertheless, reflect the relatively even distribution of popularity scores among composers of all historical eras. When adjusted to reflect how frequently different composers are broadcast using an item perspective, however, the shape of the corresponding boxplots in Figure 3.16 shifts dramatically. For all eras, the group mean popularity scores are elevated (reflecting more popular composers being broadcast more frequently), however this increase is dramatically more pronounced for all eras except Post-modern and Pre-Baroque. When curating music, ABC Classic FM selects from among the most popular Romantic era composers to place in high rotation, but fails to do so nearly to the same extent for post-modern composers. This serves to amplify the tension between the network's traditional and more avant-garde listeners, and emphasises the challenge of mediating unfamiliar music to audiences.

3.4.3.2 Playlists

While this content analysis is largely limited to a composer-level granularity on the music featured on each platform, the availability of track popularity scores in the Spotify dataset allows for a partial investigation of the relationship between composer

and track popularity scores. As with the distribution of artist popularity scores across the entire Spotify service, the distribution of scores for track exhibits a similar heavy strong positive skew. From a sample of 40,897,765 tracks, the mean score is just 2.59, with the mode (most common) score of zero shared by 67.73% of all tracks. Figure 3.17 shows the cumulative contribution of increasing composer and track popularity scores as a proportion of the overall number of composer and track records. The left-hand side shows how the data is distributed for *all* content in Spotify, with the right-hand side graph reflecting just the classical playlists data included in the current content analysis. Unsurprisingly, the curated playlist data draws on tracks and composers in a manner which does not reflect the dominance of low popularity items in Spotify's database. While the global data shows a slight preponderance of low-popularity tracks as opposed to artists, this is substantially magnified in the playlist data. This suggests a curatorial process which relies more heavily on the name recognition and popularity of composers. Less popular – and likely less familiar – works are only likely to be programmed if they come from composers who already enjoy a level of popularity. The unfamiliar, therefore, is more likely to be confined to the more modest exploration of particular works as opposed to exposing audiences to less familiar composers.

Figure 3.17 Composer and track popularity



3.4.4 Distinctiveness as familiarity

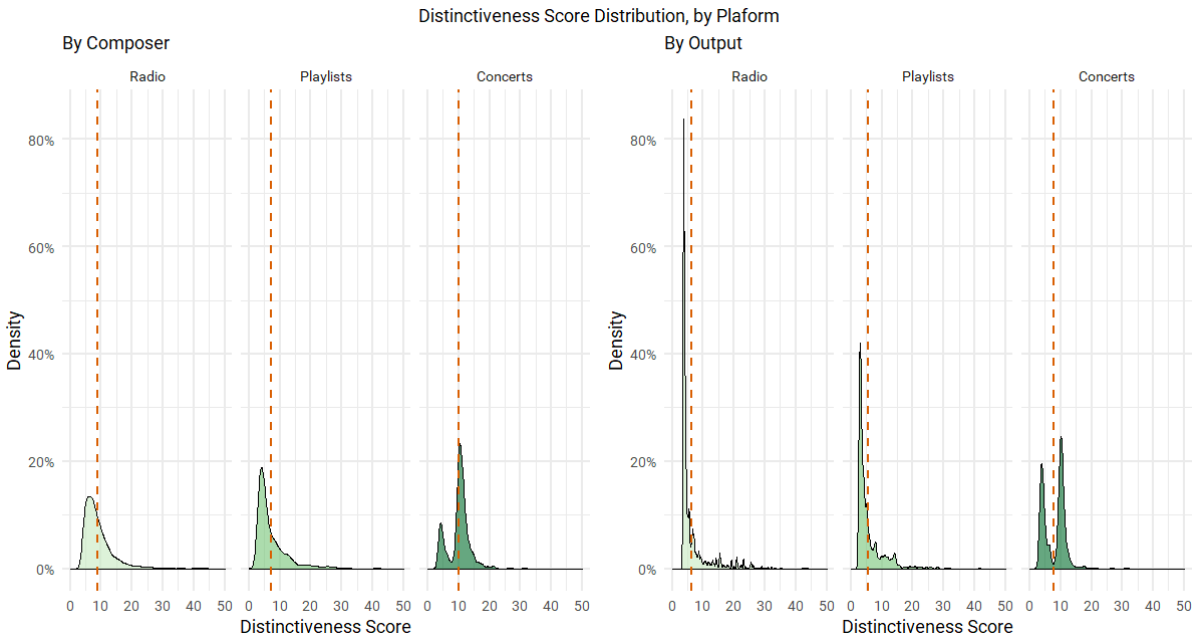
While popularity provides a measure of relative global familiarity, it does not attempt to account for the relative 'acoustic distance' between the music of different composers. Two composers sharing the same popularity score may be stylistically diverse and likely have differing degrees of familiarity for particular audiences (e.g. George Gershwin and Johann Strauß Jr both have a popularity score of 55). Conversely, music which is unpopular and/or infrequently programmed may nevertheless be acoustically quite similar to works regularly broadcast on a platform. The third measure of familiarity examined here seeks to address this by considering how acoustically distinctive each composer is in the context of the music featured on each platform. As detailed in 3.3.4, this measure is derived by incorporating the model of acoustic similarity developed in Chapter 2 to consider how distant and distinctive music is on a particular platform. While audiences may gain familiarity with music they encounter on a platform through different media, the notion of measuring distinctiveness is nevertheless able to provide a more fine-grained proxy for analysing familiarity.

Summary statistics for the composer and item perspective distinctiveness scores across each platform are listed in Table 3.19 below. Higher distinctiveness scores correspond to composers who are more acoustically distinct in the context of the platform on which they are featured. Contrasting the three profiles shows concerts to offer the most distinctive programming, with a mean output score of 9.46. While the composers featured on radio display considerably more acoustic diversity when compared to playlists, with means of 9.01 and 7.05 respectively, this gap all but disappears when the frequency with which composers are programmed is taken into account. The density plots in Figure 3.18 further highlight the contrasts between the three platforms. Radio's output, for instance, is particularly skewed by the high frequency of stylistically archetypal composers such as Mozart ($u_i = 3.56$), Bach ($u_i = 3.66$) and Beethoven ($u_i = 3.66$). In spite of this, the long tail of radio's more idiosyncratic content ensures that it achieves a mean value which is higher than playlists. Playlists, by comparison, offer the most homogeneous listening experience.

Table 3.19 Distinctiveness score distribution statistics

Platform	Composer Mean	Composer Median	Output Mean	Output Median
Radio	9.01	7.76	6.23	4.04
Concerts	10.03	10.45	7.87	9.46
Playlists	7.05	5.16	5.67	4.05

Figure 3.18 Distinctiveness score density plots

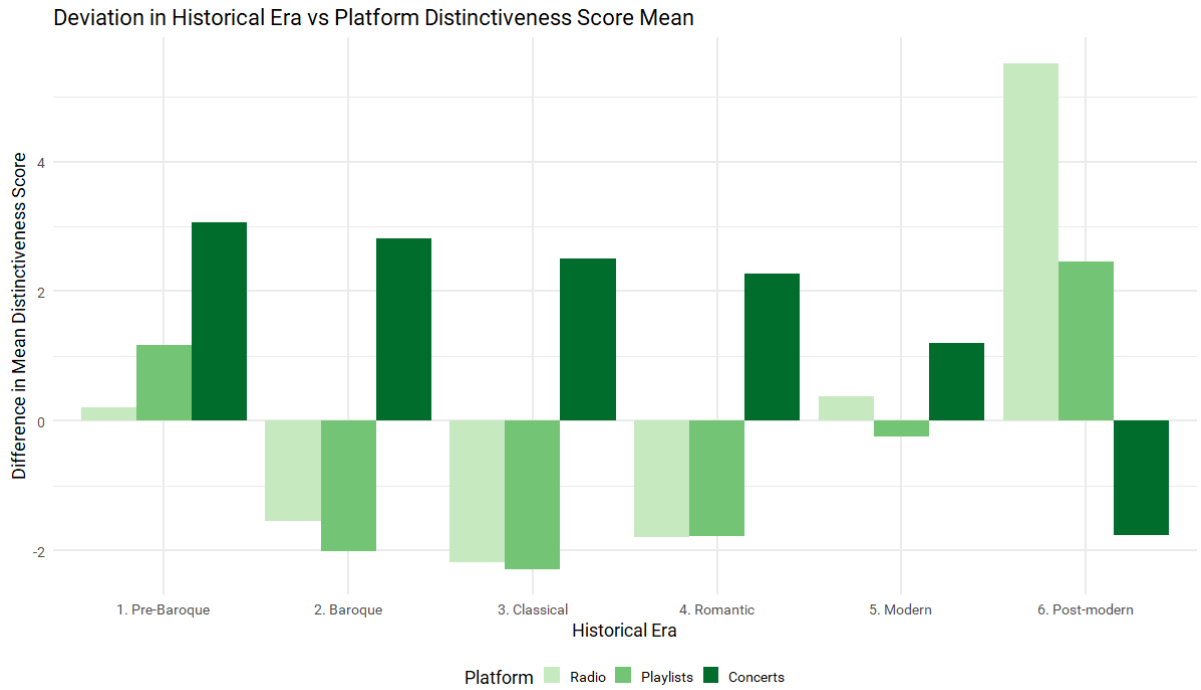


Dashed red vertical lines indicate mean distinctiveness scores.

Whereas with popularity, for which the popularity of a composer on Spotify was used as a global measure for *all* platforms, distinctiveness scores for individual composers are specific to each platform. Mozart, for example, has distinctiveness scores of 3.56, 2.80 and 10.08 on radio, playlists and concerts respectively – reflecting the varying degree to which his style of music is typical for each platform. This is clearly shown in Figure 3.19, which shows the difference between the mean distinctiveness score for content in each historical era and compares that to the overall mean for each of the three platforms. While for radio and playlists the acoustic sounds of the more experimental post-modern era are more distinctive than what they would normally curate, the inverse is true of concert programs. Instead, increases in the relative

distinctiveness of music is correlated with increasing temporal distance from the post-modern era. While Baroque music will not necessarily be completely unfamiliar to concert audiences, it will nevertheless be unfamiliar in that context of presentation.

Figure 3.19 Variation in distinctiveness score means, by historical era and platform

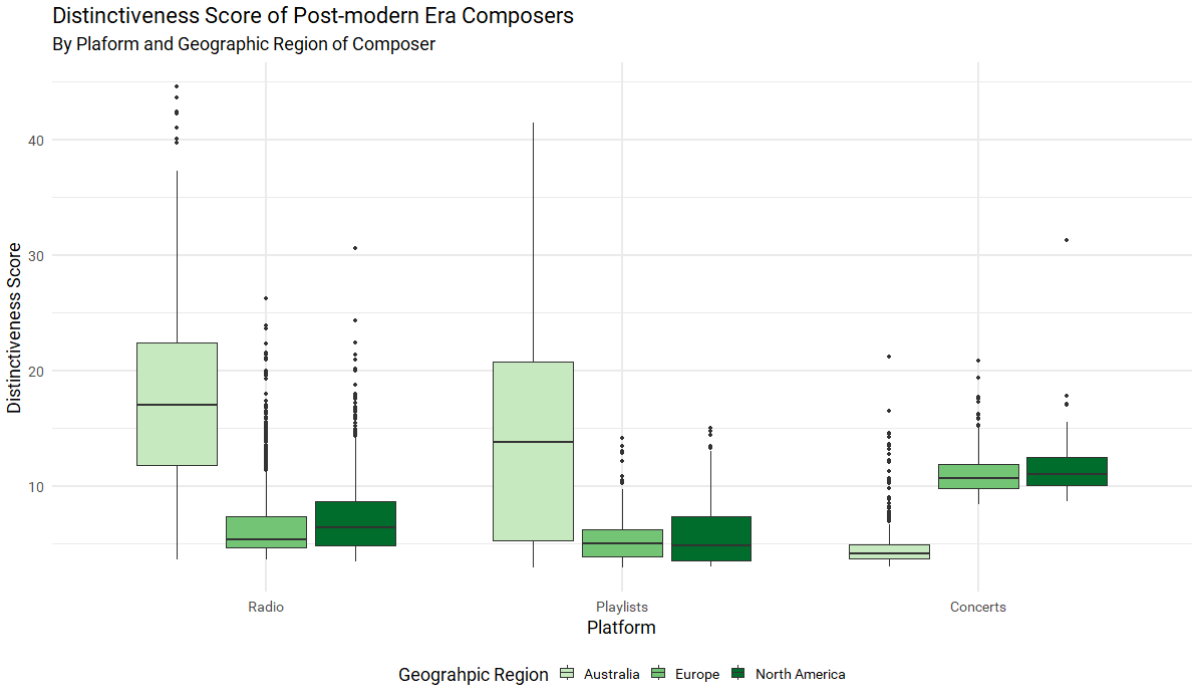


The y-axis shows the difference in mean distinctiveness scores when the platform-specific mean is subtracted from the mean for each combination of historical era and platform. Positive values indicate that a combination is more distinctive than the platform average.

The capacity for distinctiveness scores to identify the extent to which particular forms of music are unusual for a particular platform also allows for scrutinising how contemporary Australian art music fits into different broader music profiles. Considering just post-modern era composers, which encompasses the vast majority of Australian composers, Figure 3.20 presents boxplots of the distinctiveness scores for each platform. To contrast the representation of Australian music, its distinctiveness score range is shown alongside composers from each of Europe and North America. While Australian art music might understandably be distinctive in the context of the overall musical profiles of radio and playlists, it is interesting to observe that the Australian music which is selected on these platforms manages to be substantially

more distinctive even within the more eclectic boundaries of the post-modern era. While the live concert data's emphasis on Australian composition justifiably reverses this trend, it suggests a particular challenge for audiences approaching Australian art music on both ABC Classic FM and Spotify playlists. The post-modern era music programmed from other regions bares much greater similarity to the canon of Western art music which predominates on these platforms.

Figure 3.20 Distinctiveness scores of post-modern era composers, by geographic region



3.4.5 Symbolic and economic capital

In addition to the representations of familiarity considered above, the musical space of composers from which curators select can also be viewed from the perspective of symbolic and economic capital. As for the major structuring principles discussed by Bourdieu (1993) in his analysis of fields of cultural production, the methodology above (see Section 3.3.5) devised ways of operationalising these concepts based on a composer's accumulated artistic prestige and performing right earnings. The analysis below focusses specifically on the curation of Australian composers to model how they combine to predict the frequency with which they are broadcast on ABC Classic FM. Cultural intermediaries are not neutral actors in this respect, in that they both respond to and help shape the capital distributions which are examined. Rather than scrutinising this directionality, the analysis aims to discern which positions in the field

are able to command more authority in determining which music is presented to audiences.

Taken by itself, a model incorporating only symbolic capital (using the proxy of artistic prestige as derived in Section 3.3.5.1) as a main linear effect is statistically significant but only capable of explaining approximately 5% (adjusted R-squared of 0.052) of variability in composer broadcast frequency. Adding a quadratic function to symbolic capital and adding an interaction effect with composer year of birth, however, substantially improves the model, as specified in Model 3.1 below and visualised by way of an interaction plot in Figure 3.21. Artistic prestige has an exponentially positive effect on broadcast frequency, but this is highly contingent on age. For older composers, having accumulated a high level of prestige is associated with significantly higher exposure on ABC Classic FM. That the size of effect weakens dramatically as year of birth increases can be interpreted in terms of the antipathy of ABC Classic FM to the specific forms of artistic prestige which tend to be accumulated by younger composers. As a main effect by itself, age only provides scant explanatory power for broadcast frequency (adjusted R-squared of 0.052), however the forms of symbolic capital accumulated by successful emerging composers are likely to place them in a relational position which is not rewarded by the sort of mainstream recognition represented by exposure on radio.

Model 3.1 Symbolic capital and age in predicting broadcast frequency

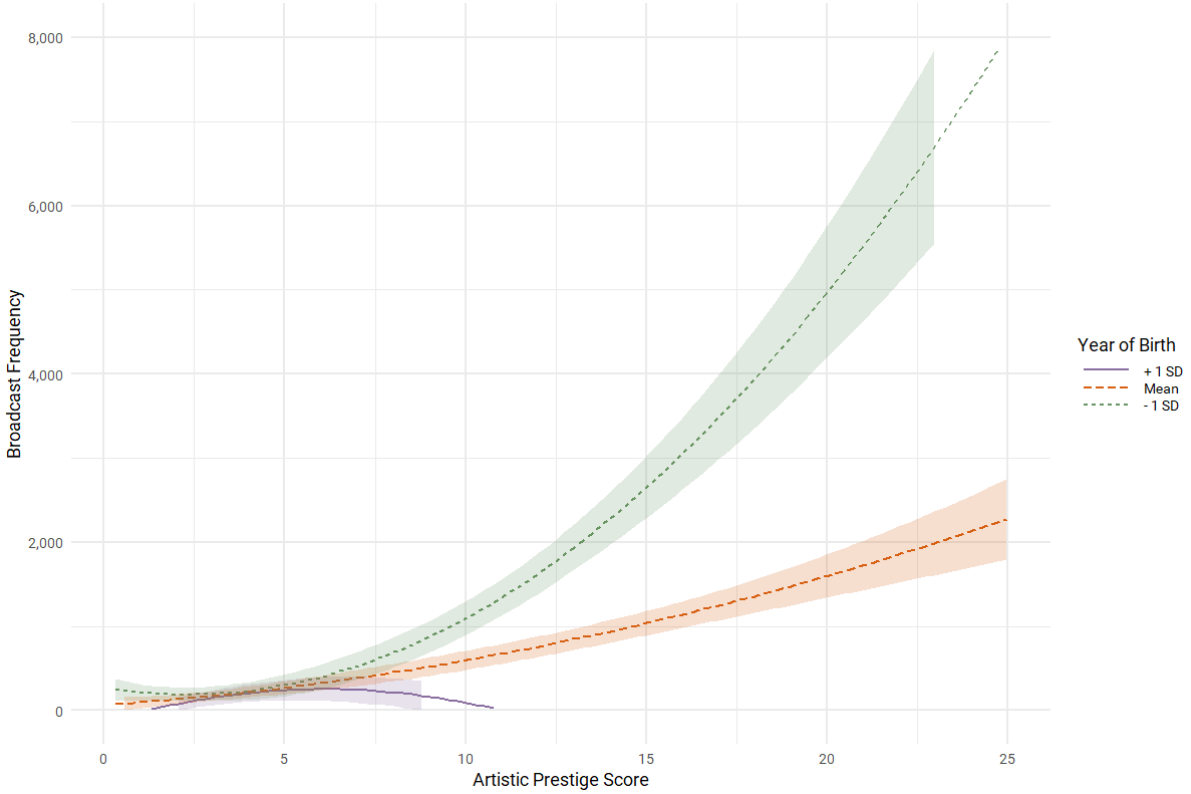
Term	Coefficient	SE	T-statistic	P-value
Intercept	21,082	5,539	3.806	< 0.001 ***
Symbolic Capital	-10,164	2,680	-3.793	< 0.001 ***
Symbolic Capital²	1,325	189.5	6.992	< 0.001 ***
Year of Birth	-10.74	2.829	-3.798	< 0.001 ***
Symbolic Capital:Year of Birth	5.21	1.369	3.807	< 0.001 ***
Symbolic Capital²:Year of Birth	-0.676	0.097	-6.987	< 0.001 ***

Residual standard error: 416.6 on 230 degrees of freedom

Adjusted R-squared: 0.467

*Quadratic regression formula: Broadcast frequency ~ Symbolic Capital² * Year of Birth*

Figure 3.21 Interaction plot for Model 3.1



Shaded regions indicate 95% confidence intervals.

Economic capital, conversely, has considerably more explanatory power when taken by itself, with a single main effect model achieving an adjusted R-squared of 0.339. When combined with an interaction effect of composer year of birth, Model 3.2 achieves an r-squared of 0.571. As visualised in Figure 3.22, earnings demonstrate a linear positive relationship with broadcast frequency, with year of birth strongly moderating the rate at which broadcast frequency increases. While there is a small degree of circularity – earnings are in part derived from broadcast frequency on ABC Classic FM – the economic capital of a composer is more influential in predicting curation than symbolic capital. This disrupts the traditional conception of contemporary art music, as a field of restricted production, which might otherwise expect symbolic capital to be regarded with greater importance.

Model 3.2 Economic capital and age in predicting broadcast frequency

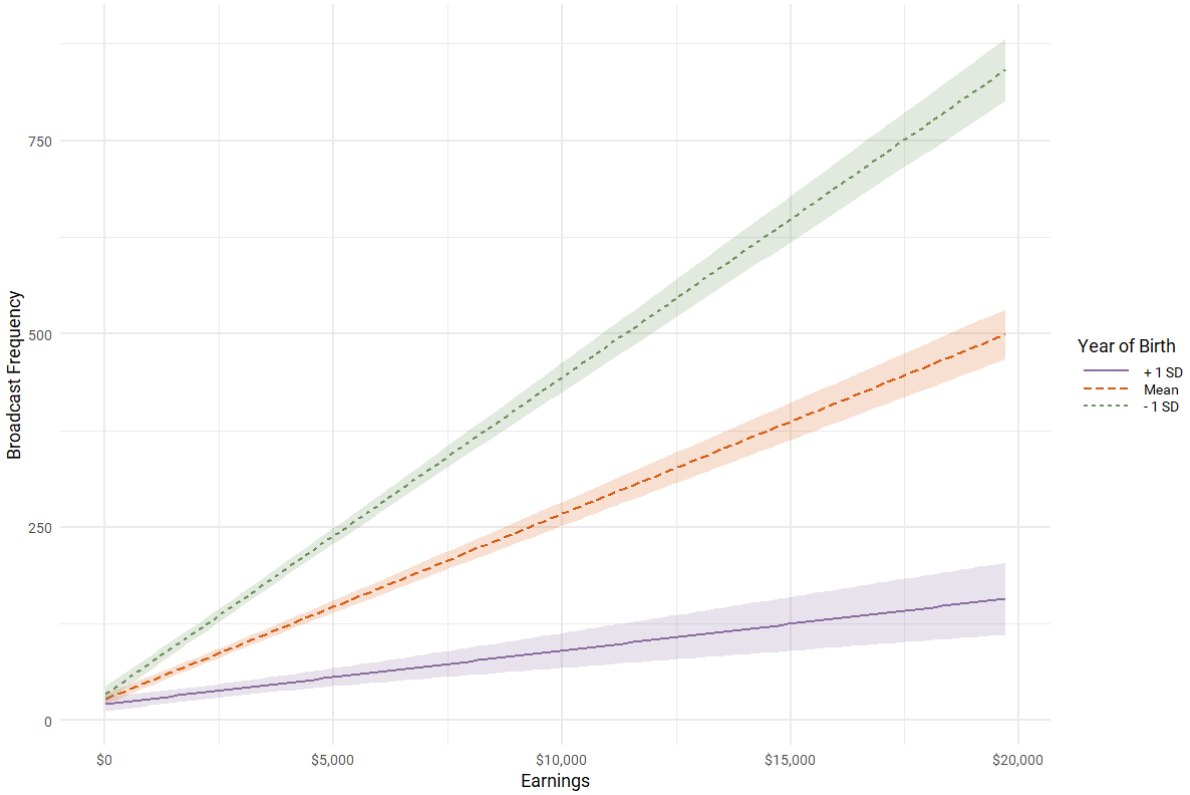
Term	Coefficient	SE	T-statistic	P-value
Intercept	592.23	519.9	1.1	0.26
Economic Capital	1.578	0.1	13.4	< 0.001 ***
Year of Birth	-0.288	0.3	-1.1	0.28
Economic Capital:Year of Birth	-0.001	0.0	-13.2	< 0.001 ***

Residual standard error: 105.769 on 503 degrees of freedom

Adjusted R-squared: 0.571

*Linear regression formula: Broadcast frequency ~ Economic Capital * Year of Birth*

Figure 3.22 Interaction plot for Model 3.2



Shaded regions indicate 95% confidence intervals.

For models which combine both symbolic and economic capital, no significant interaction effect was found between the two variables in predicting broadcast frequency. Similarly, for models predicting popularity or distinctiveness involving

symbolic and economic capital, only weak main effects were found, with no indication of interaction effects. To the extent that broadcast frequency can be considered to provide a *reflection* of field positions, it emphasises that neither symbolic or economic capital can be usefully considered without giving respect to the ways they interact with age. ABC Classic FM forms part of the dominant institutional definition of the field and the various strategies of distinction pursued by emerging and, therefore, culturally speaking, dominated composers can place them in an antithetical position with regard to the curators who are the gatekeepers to legitimate consecration.

3.4.6 When and where is unfamiliar music broadcast?

Beyond differences in the overall profiles of familiarity on different platforms, it is also of interest to consider how curation can function to emphasise when and where music of differing levels of familiarity is presented to listeners. The fixed temporal dimension of broadcast radio listening is fundamental to how that industry measures audiences and this analysis firstly examines the extent to which trends in familiarity can be aligned with time of day. The second area of interest concerns the degree to which individual radio programs and Spotify playlists are able to distinguish themselves by their approach to familiarity. Within the platform-level trends examined in the preceding analysis, curation will also operate with greater specificity as programmers and curators work on particular radio programs and playlists. The second part of this analysis, therefore, examines how platform-level distinctiveness scores vary among individual programs, together with how distinctiveness operates *within* the repertoire presented in individual programs.

To examine how familiarity varies across time of day, the distinctiveness scores for ABC Classic FM data were plotted as quintiles. Figure 3.23 displays how each quintile varies in the proportion of music broadcast on the network in three hour blocks, with the left graph plotting this for weekdays and the right graph showing the same data as featured on weekends. In contrasting the top (red) and bottom (orange) quintiles in particular, notable trends can be observed in terms of when predominantly familiar and unfamiliar music is broadcast. During peak listening times of weekdays between 6am and 3pm, almost 27% of music comes from the quintile with lowest

distinctiveness scores. During the same time frame, the highest scoring quintile occupies just 15.5% of airtime. A similar pattern is repeated on the weekend, with the exception that the most distinctive quintile occupies a commanding proportion of the network's output from 3pm onwards – reaching 38.2% for the 9pm-midnight window. This latter trend points to the way in which curatorial processes tend to segment the unfamiliar from audiences. In contrast to the unchallenging 'flow' programming which occurs during the day, weekend evenings, in particular, are given over to specialist interests which might otherwise alienate a generalist audience. This compartmentalising of the distinctive musical sounds presents challenges for radio to be a vehicle of music discovery. If diverse musical sounds are largely partitioned to particular times of day – particularly those with low audiences – this presents a barrier for audiences to be exposed to and have the opportunity to develop an appreciation for new musical styles.

In addition to the trend for distinctive music to be clustered by time of day, considerable variation is shown in the distinctiveness profiles of individual radio programs and Spotify playlists. This is shown in Figure 3.24 and Figure 3.25 which show the mean distinctiveness scores for particular radio programs and Spotify playlists respectively. In addition to how distinctive the individual program or playlist is in the context of all platform content, the figures also identify a context-specific distinctiveness score (u_{ip}, see Section 3.3.4 above) which limits its calculation to other works featured in the same program/playlist.

Of the radio programs, only three have mean platform-level distinctiveness scores above ten: New Music Up Late (14.7), New Music Australia (12.6) and The Listening Room (10.3). All of these have an acknowledged focus on contemporary or experimental musical styles, with The Listening Room having been fundamental in the development of the genre of sound art in Australia (Richards, 2003). Conversely, the programs which are the regular mainstays of the network (Classic Breakfast, Mornings and Afternoons) all have mean scores of between 5.6 and 6.1. It is particularly interesting to observe that the more extreme programs, in terms of platform-level distinctiveness, also tend to exhibit *greater* within-program distinctiveness. Rather than simply being distinctive in the context of the network

itself, these programs are also less likely to be clustered around an acoustically homogeneous set of composers. It suggests that curating the unfamiliar is not simply a matter of demarcating difference in *relation* to a broader field, but extends to embracing novelty and heterogeneity as a more fundamental principle of consumption. The exceptions to this trend are effectively limited to genre-specific programs (e.g. The Game Show; Screen Sounds; The Opera Show), which consistently exhibit a more homogeneous sound within the scope of their specialisations.

A similar overall pattern is present among the Spotify playlists, with only three playlists achieving a mean distinctiveness score above 10: Best of Australian Classical, Women in Music and Mørketid (a playlist inspired by the Artic Polar Night). Again, this speaks to the marginal position occupied by both Australian and female-composed music within the classical canon. The decline in mean platform distinctiveness among Spotify playlists is, however, much more pronounced than that observed among radio programs. This points to playlists offering a significantly less differentiated listening experience – an effect which is magnified by the trend towards lower playlist-specific distinctiveness scores, particularly for those which already exhibit low platform distinctiveness. This suggests a listening environment which is chosen to avoid being confounded or challenged, and which instead values familiarity and consistency. It is interesting to observe that it is not the mood or functional oriented playlists which occupy the lowest end of distinctiveness scores; rather it is instrumental and generalist playlists which lean most heavily on familiarity. In this regard, the functional playlists exhibit a surprising level of relative diversity. Instead of reconfiguring distance and familiarity in a manner which is homogeneous when viewed through the lens of classical music, they continue to offer a level of musical diversity.

Figure 3.23 Distinctiveness by time of day

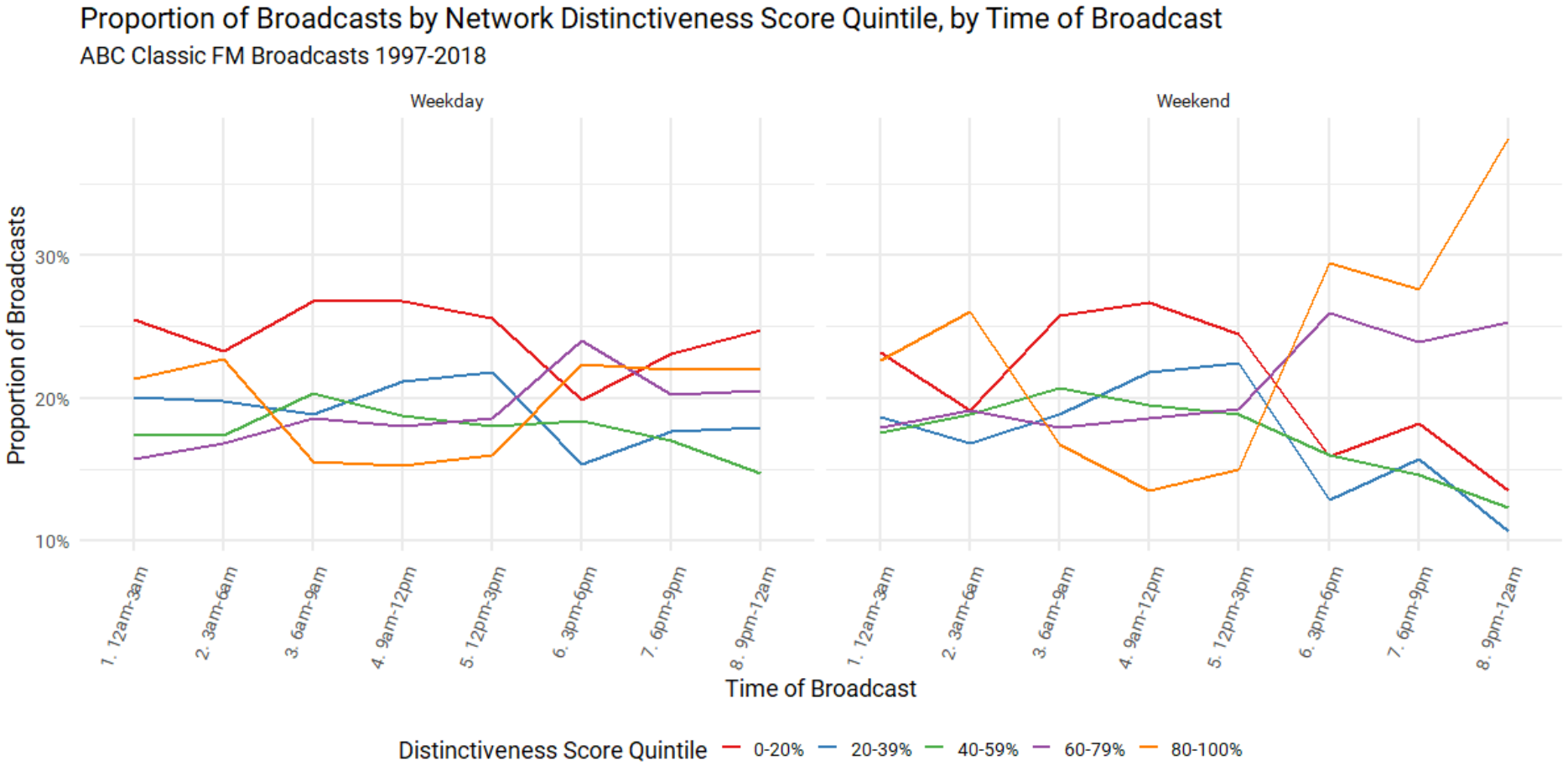


Figure 3.24 Distinctiveness by program

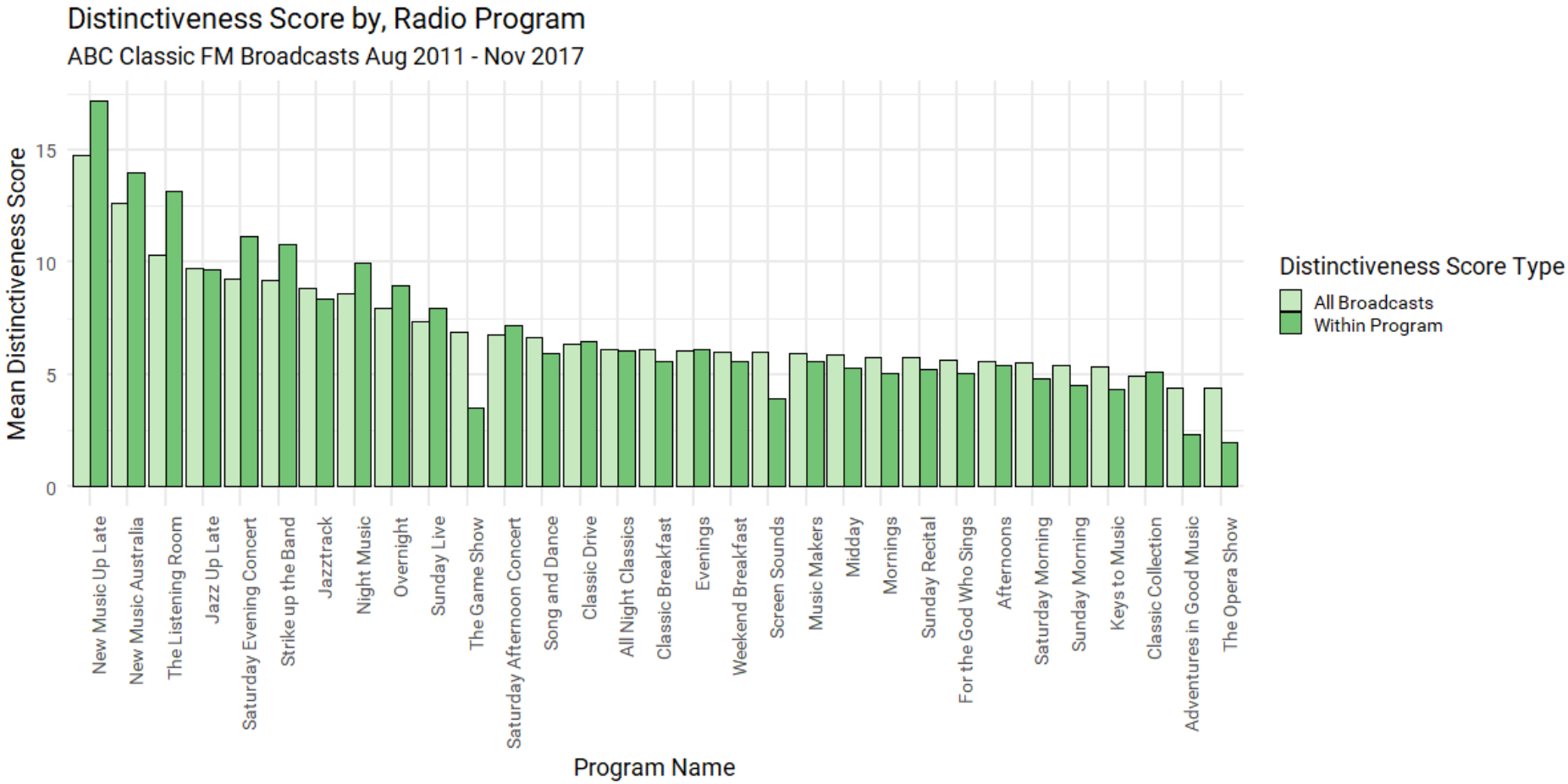
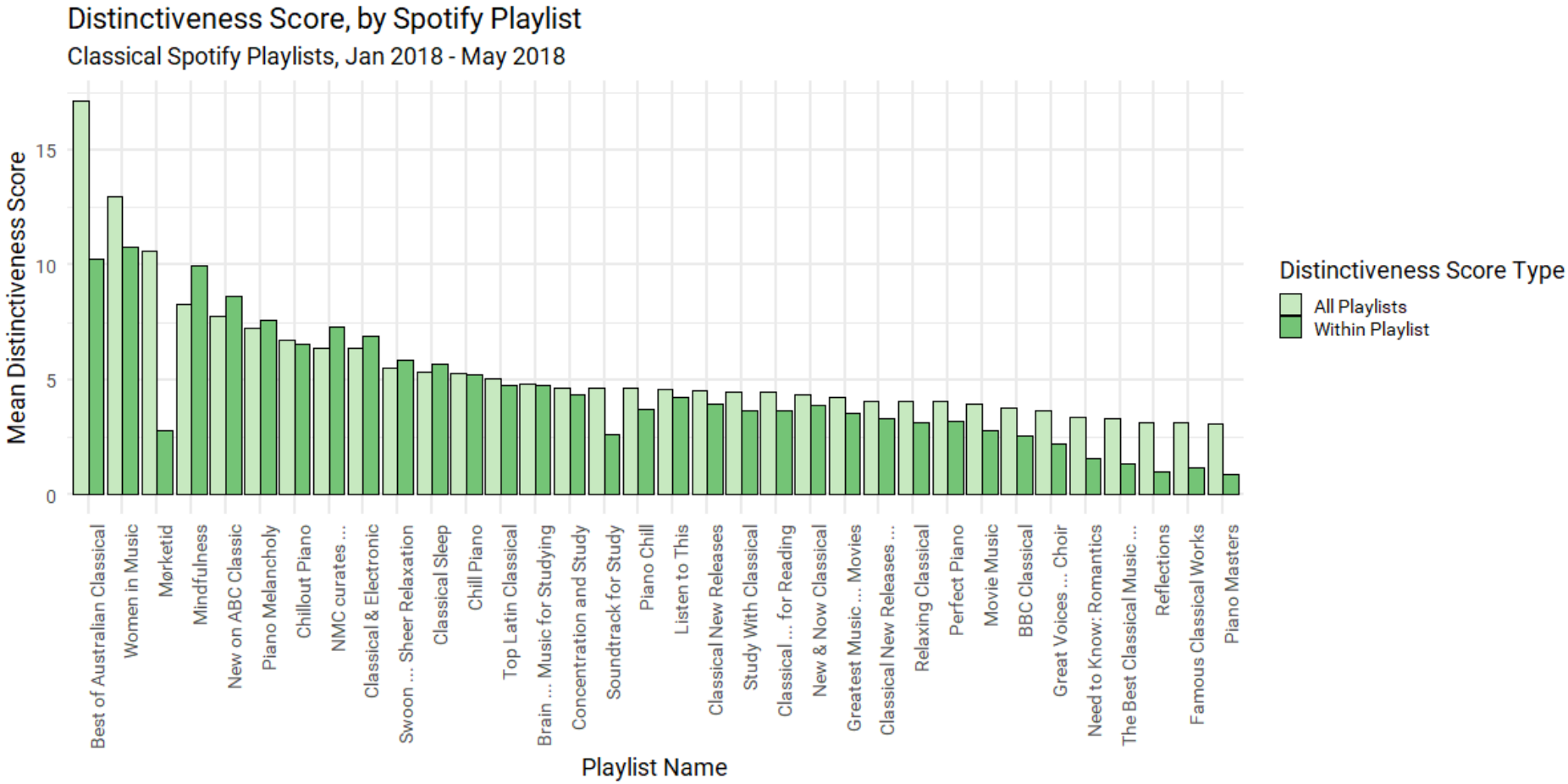


Figure 3.25 Distinctiveness by playlist

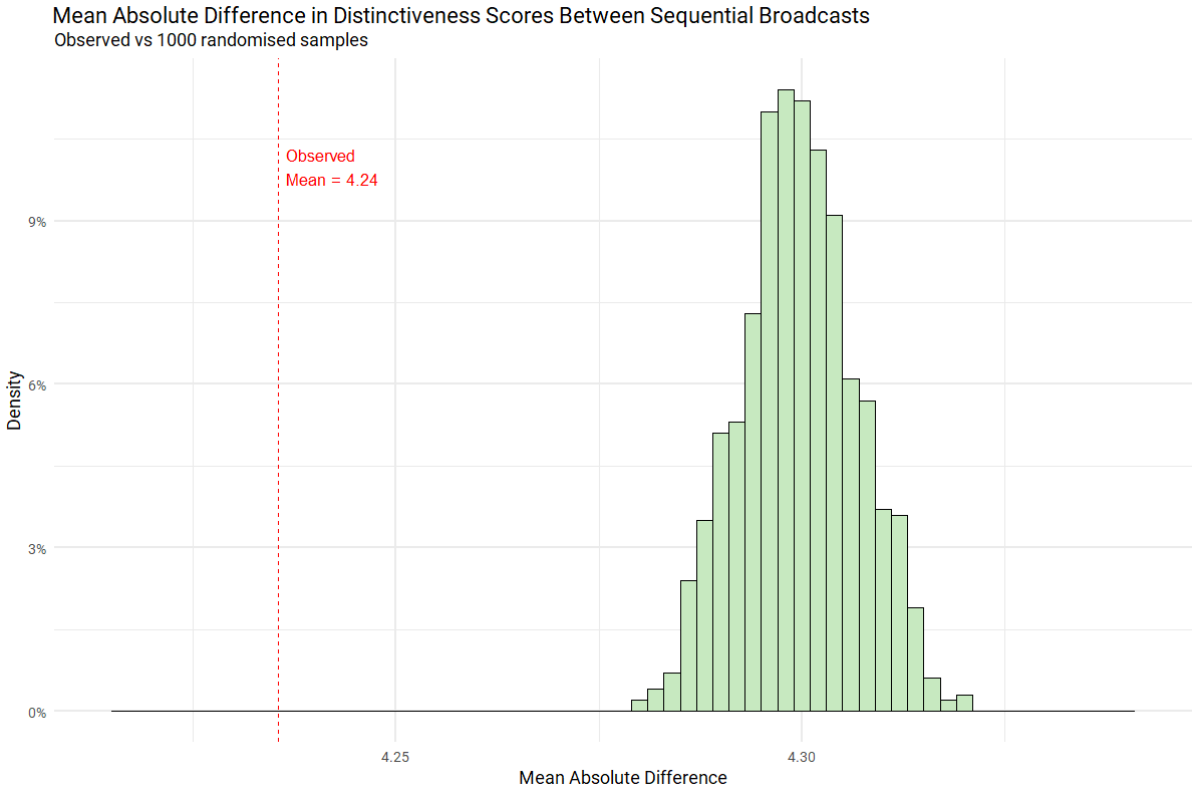


3.4.7 Trajectories of unfamiliar music

Having previously shifted from contrasting entire platforms to comparing times-of-day and programs within platforms, this section moves the level of analysis to the specific sequencing of works involved in presenting highly distinctive, and likely unfamiliar, music to audiences. Drawing on the notion of 'trajectories' of distinctiveness, the analytical approach takes pairs of sequential works to examine the patterns by which listeners are prepared for and then 'recover' from highly distinctive music.

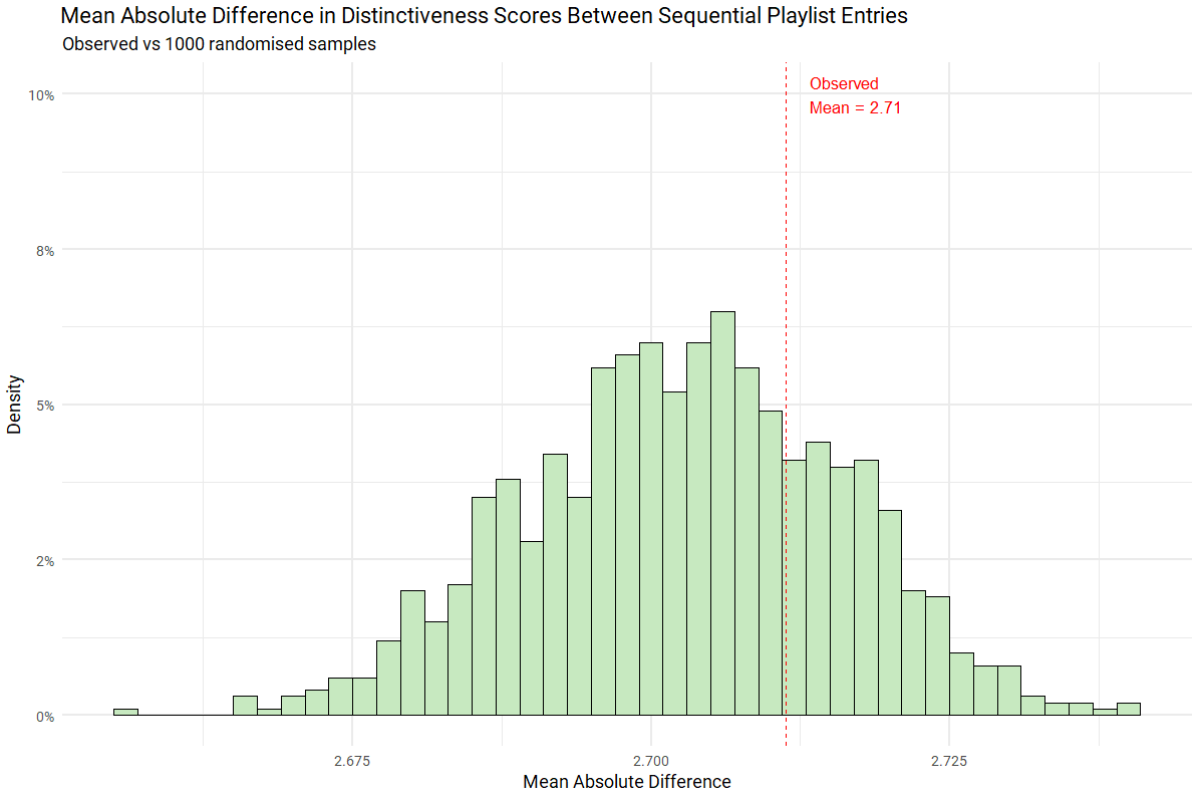
In the case of radio, the sequencing of works is a continuum which spans the entire date range in the dataset being analysed. In practice, this continuum is broken by the packaging of works into discrete programs and the scope of data analysed was restricted to sequential broadcasts which belonged to the same program and which included both acoustic distance data and distinctiveness scores. For each of the resulting 185,473 pairs, the absolute difference in distinctiveness score was calculated, with an overall mean value of 4.24. To evaluate how curatorial processes have shaped the trajectories by which users traverse familiarity, the observed data was compared against randomly drawn permutations. Drawing on Monte Carlo approaches to establishing a reference distribution (Ernst, 2004), the sequences for each program were randomly reordered 1000 times to assess how the same observed collection of works, and corresponding distinctiveness scores, would appear to audiences if arranged randomly. The resulting histogram for these permutations, together with the observed mean in the empirical data, is shown in Figure 3.26. Classic FM's mean is over 9 standard deviations less than the average of the random permutation means, reflecting a much smoother transition in the distinctiveness of broadcasts than would otherwise be produced by randomly programming the same works.

Figure 3.26 Trajectories of distinctiveness difference in sequential radio broadcasts



While the event data is without the sequencing data to permit an analysis, the Spotify playlist data provides a comparison which further emphasises the significant role played by curation observed above in radio. As with radio, playlist sequences within individual playlists were subjected to 1000 permutations of random reordering. The observed mean absolute difference in distinctiveness score of the resulting 25,535 samples was 2.71, which already suggests a less disjointed experience in contrast to radio. As shown in Figure 3.27, however, there is effectively no significant impact of curation with the observed mean, instead falling within one standard deviation of the randomised means. This suggests that playlists largely eschew the kinds of nuanced curation commonly associated with music programming. This may be in part due to a listening context in which listeners can readily skip to the next track or view and select from the overall curated list as they desire.

Figure 3.27 Trajectories of distinctiveness difference in sequential playlist entries



In addition to the sequence pairs examined above, distinctiveness scores can also be used to analyse how curation works across longer sequences of broadcasts. Taking sequences of three-broadcasts (u_1, u_2, u_3), for example, it is possible to identify 6 potential trajectories of distinctiveness scores: (i) ascending ($u_1 < u_2 < u_3$), (ii) V-ascending ($u_2 < u_1 < u_3$), (iii) V-descending ($u_2 < u_3 < u_1$), (iv) inverted-V ascending ($u_1 < u_3 < u_2$), (v) inverted-V descending ($u_3 < u_1 < u_2$) and (vi) descending ($u_3 < u_2 < u_1$). To examine trajectories of unfamiliar music on radio, the top 10% of values for u_2 were selected to reflect the most distinctive music featured on the network. Comparing empirically observed means to the average of randomised permutations shows patterns (iv) and (v) to be less common in the Classic FM curated broadcasts by an order of 4.9 and 4.5 standard deviations respectively. That both of these are the only trajectories which place u_2 above both u_1 and u_3 points to the increased clustering of highly distinctive works together. Listeners are less likely to be given a preparation and recovery trajectory when presented with highly distinctive works; instead they will be preceded or followed by music of increasingly distinctive composers. This points to the capacity for distinctiveness to become a pattern in and

of itself, whereby the sound of something 'familiar' is no longer reassuring but confusing and out of place.

A more detailed examination of trajectories in the curation of unfamiliar music is beyond the scope of this chapter, but the analysis above points to the potential for these approaches to scrutinise the variations which occur in curatorial processes.

At a broader level, the contrast observed between the curation of radio and the effectively random juxtapositions of musical content on playlists represents a significant shift in the context of art music presentation. A number of participants interviewed in Chapter 4, observed that it was the 'art of programming' which was crucial to bridge the gap of unfamiliarity and introduce audiences to new music. This curatorial skill was largely discussed in the context of live music programming, with Belinda, a performer in her 30s, emphasising its importance for developing audiences:

> *Belinda:* *I think it's a lot to do with programming … How do you prepare the audience for what they're going to hear? … I think when we're constructing the program we can help the listener.*

It is not just the rise of digital listening environments to which this loss of curatorial expertise can be attributed. At the ABC, the launch of the internet only radio station ABC Classic 2 in June 2014 caused internal and public outcry at the suggested use of computer-assisted or fully automated programming (Strahle, 2016). Not only are there questions about the sustainability of human-curated radio programs in the face of digital competition, but the contextual presentation of those programs – which includes discursively preparing listeners to hear a work by a presenter – is also at risk of disappearing or being replaced by generic pre-recorded voice tracking.

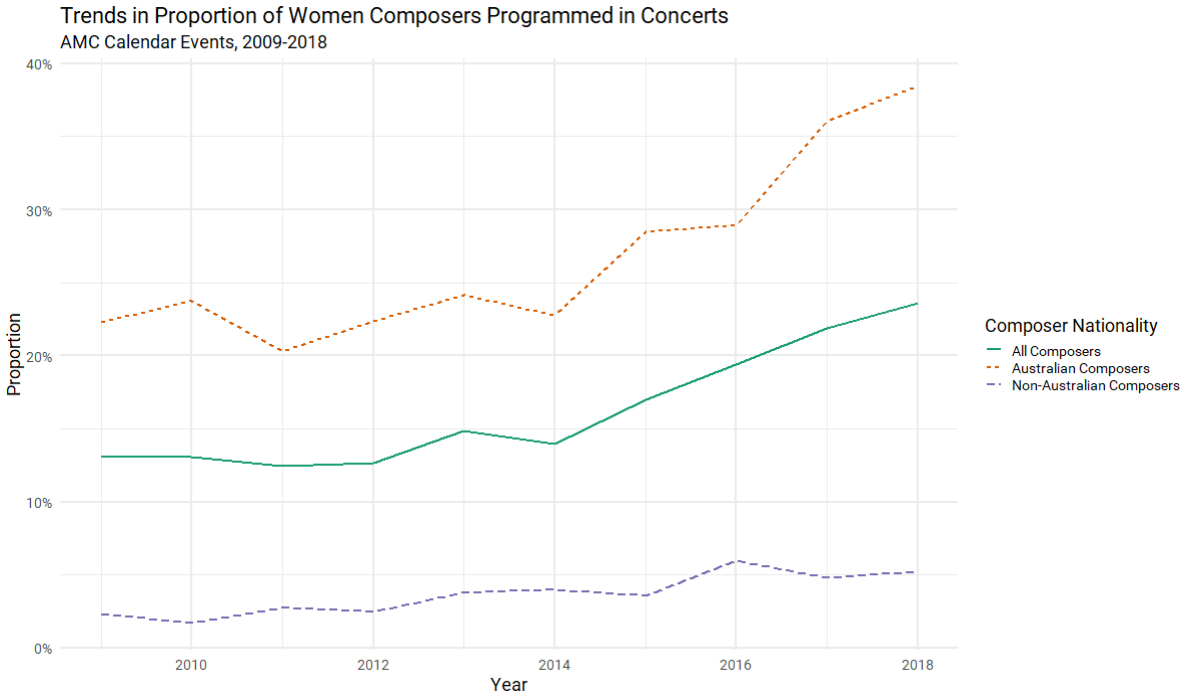
3.4.8 Performers as curators

In focussing on the outputs of individual platforms, the preceding analysis has effectively omitted any consideration of the nature of individual curators and the capacity for attributes such as gender to be a factor in curatorial decisions. While access to the individuals selecting and curating radio programs and Spotify playlists is beyond the scope of the present analysis, the concert event data does present an

opportunity to scrutinise the role of curators in more detail. For this mode of presentation, it is largely performing ensembles and individuals who are responsible for curating programs and the detailed performer information captured in the AMC database permits an analysis of how different patterns of artistic programming emerge from different types of curators. In particular, the analysis focusses on the topical issue of gender equity, and how the gender and size of the presenting ensemble influences the gender of composers whose work is presented. While other social dimensions – such as race and class – are also significant candidates for consideration, gender has been the subject of considerable focus for the music sector generally (Strahle, 2019) and art music in particular (Green, 2019). The overall profile of music presented by ensembles is also examined, with particular regard to identifying those ensembles which champion and advocate for presenting the unfamiliar to audiences. Distance, in this respect, relates to the capacity for curatorial processes to go beyond standard conventions and shift how the field is understood – even if that simply involves becoming more balanced and representative of the society in which it is consumed.

The under-representation of women composers has been a source of criticism aimed at Australia's new music landscape (Macarthur, 2014). Macarthur's study found only 11% of programmed music in her 2013 sample were by women, which had represented a substantial decline since a comparable sample in 1995 had that figure at 35%. It has since been argued that performance groups, in particular, need to 'let go of tradition and become more aware of gender diversity' (Macarthur, Hope, & Bennett, 2016) if this situation is to change. The present sample is much larger than the programs of New Music Network member ensembles used in Macarthur's analysis and records an overall figure of 16.58% of programmed composers being women across all historical eras. When only Australian composers are included, however, this figure rises significantly to 27.41%. As shown in Figure 3.28, part of the discrepancy with Macarthur's study can also be attributed to historical trends. A substantial rise in the proportion of women composers being programmed occurred after 2014, with the rise most pronounced in the context of Australian composed music.

Figure 3.28 Historical trends of gender representation in concerts



Reinforcing the argument of Macarthur et al. (2016), the gender of the performer is shown to have a significant effect on the amount of female-composed music presented to audiences. A cross-tabulation of performer gender, with a separate coding for Ensembles, is detailed in Table 3.20 below and provides a p-value of < 0.001 for Pearson's Chi-Square test. A visualisation of this cross-tabulation is shown in Figure 3.29 by plotting the standardised residuals[43] for each two-way combination of categorical variables. In this figure, a value of zero on the y-axis indicates that the observed count for a combination of variables corresponds to it expected count. Positive residuals reflect observed counts which are higher than would be expected. While ensembles (the exclusive focus of Macarthur's study) do indeed significantly under-represent female composers, the largest standardised residual (11.6) is found for females performing music by female composers, whose actual count is 31.86% higher than expected. The data also show that female composers are under-represented in the programming made by male performers to the same extent as ensembles. Identifying the gender of the artistic directors who program these

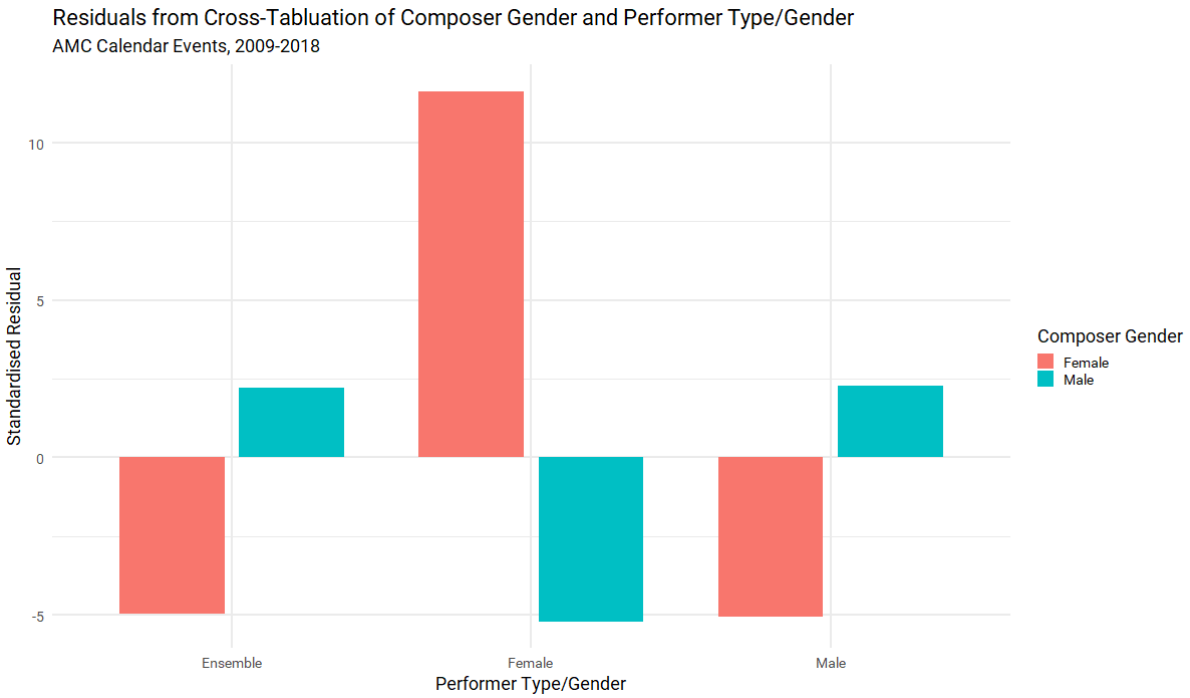
[43] Standardised residuals are calculated as the difference between observed and expected counts for a cross-tabulation cell, divided by the square root of the expected count.

ensembles is beyond the scope of the current analysis, but presents a further avenue for enquiry in establishing the sources of gender disparity among female composers.

Table 3.20 Cross-tabulation of performer gender by composer gender
n = 29,690

	Female Composer	Male Composer
Ensemble	1,907	10,892
Female Performer	1,759	6,232
Male Performer	1,290	7,610

Figure 3.29 Performer and composer gender cross-tabulation standardised residuals



Beyond the gender of the performer, the size of the performing ensemble is similarly significant in determining the gender of programmed composers. A cross-tabulation is detailed in Table 3.21, with the corresponding visualisation shown in Figure 3.30. As with the previous cross tabulation, a Pearson's Chi-Square test gives a p-value of < 0.001, which strongly rejects a null hypothesis of the variables being independent. Significant positive standardised residuals for programming of female composers is associated with both medium-sized ensembles (5.65) and composer-as-soloist (4.29),

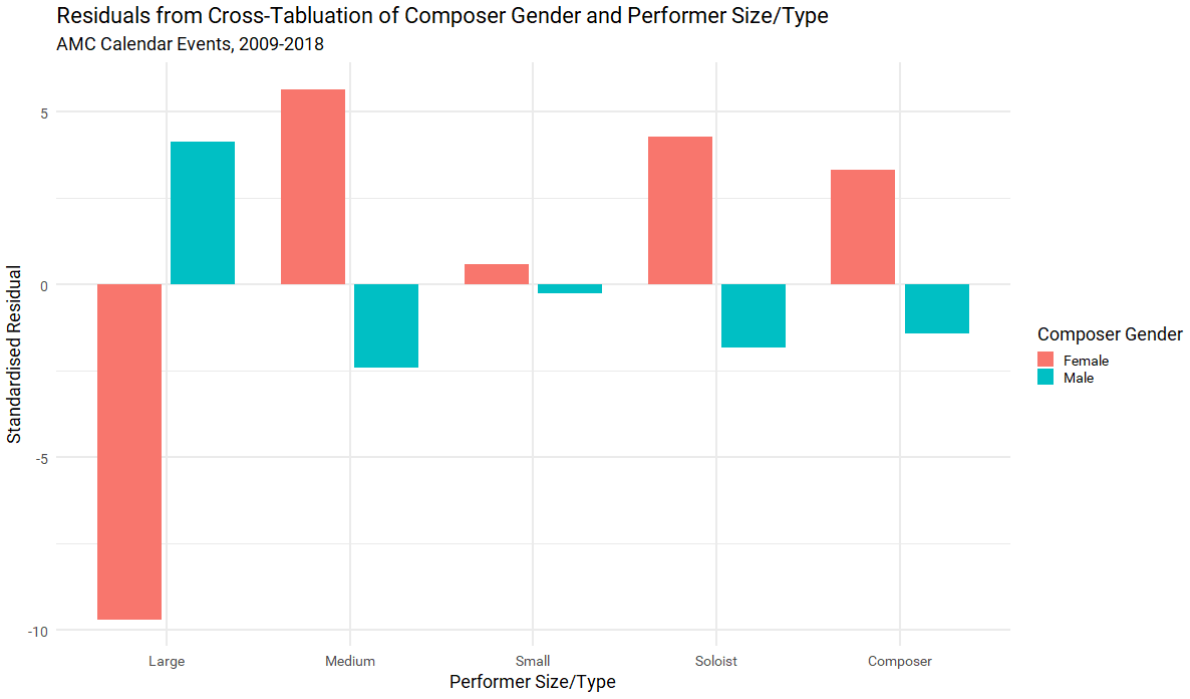
while large ensembles are positively associated with male composers (4.14). This points to the importance of female composers in presenting and advocating for their own and other female composer's music, together with the role played by medium-sized ensembles in the sector. That larger ensembles tend to occupy a more prestigious position in the sector further compounds the impact of their under-representing female composers.

Table 3.21 Cross-tabulation of performer size/type and composer gender

n = 14,289

	Female Composer	Male Composer
Large ensemble	430	3,999
Medium ensemble	462	1,843
Small ensemble	424	2,247
Soloist	832	3,818
Composer as performer	56	178

Figure 3.30 Performer size and composer gender cross-tabulation standardised residuals



The contrast between large and medium sized performing ensembles (and soloists) can further be shown when composer gender is replaced in the analysis by historical

era. Reducing historical era to a binary variable of either Contemporary (post-modern) or Heritage (all earlier eras), the cross-tabulation residuals in Figure 3.31 show large ensembles strongly preferring Heritage over Contemporary era composers, with the opposite effect true for medium-sized ensembles. Together with their role in addressing gender equity, this reinforces the importance of medium-sized ensembles to artistic risk taking within the Australian art music field. This is further emphasised when considering the popularity of programmed composers. The boxplots in Figure 3.32 show that the composers programmed by medium-sized ensembles are far less likely to have achieved any substantial level of global popularity. Conversely, large ensembles, whose funding models typically mean they can less afford to take risks, are more likely to try to attract and retain audiences through programming composers who have already achieved a relatively high level of popularity. This suggests that a minimisation of distance, through familiarity, lends itself to conservation of the field. As shown more generally in this chapter, minimising distance can therefore be observed as being allied with a more conservative artistic outlook.

Figure 3.31 Performer size and historical era cross-tabulation standardised residuals

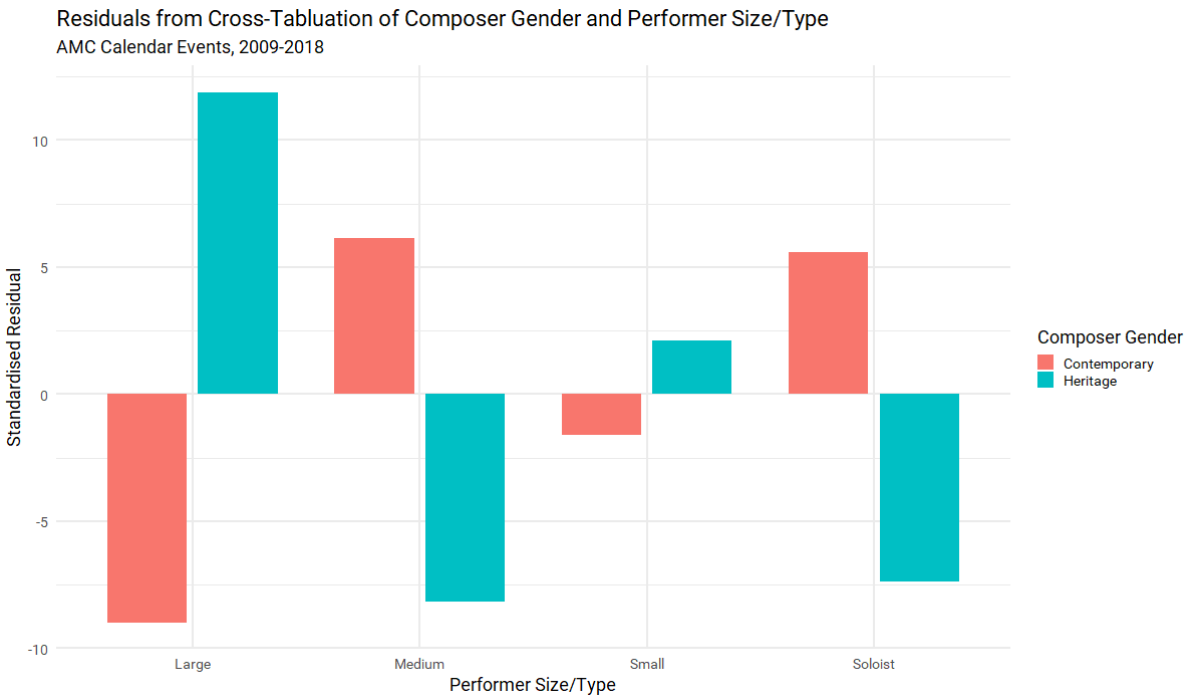
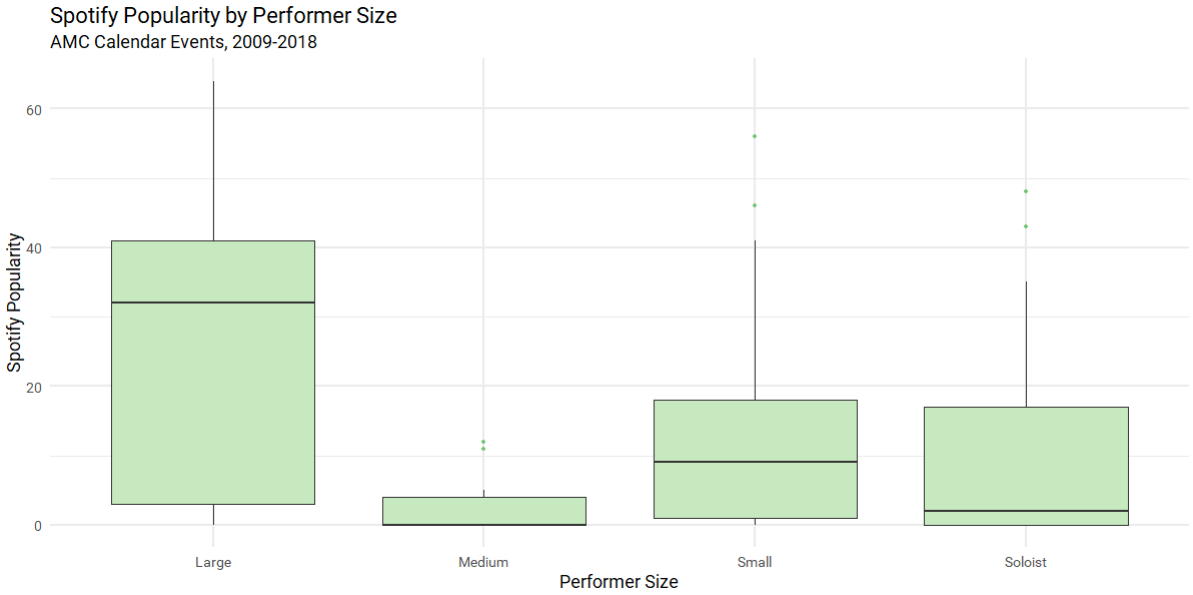


Figure 3.32 Spotify popularity, by performer size



3.5 Conclusion

The research question being addressed by this chapter sought to interrogate how different modes of presentation mediate the field of Australian art music to audiences. The relevance of this research stems from the role played by curators in variously assembling the space of producers in presenting the field to audiences, together with the recent emergence of digital listening behaviours. Whereas radio has traditionally been a dominant medium for audiences discovering new music, younger listeners in particular are increasingly turning to the burgeoning domain of digital playlists. The content analysis presented above has responded to these issues by establishing the substantive differences which arise from curatorial practices across Australia's dominant classical radio network, playlists on the global leader in digital streaming and in live concert programs. With particular respect to this thesis' interest in themes of distance and familiarity, the analysis identifies a continuum stretching from the heterogeneity and eclecticism of concerts, through to the more homogeneous and familiar sound world offered by digital playlists. Radio sits somewhat awkwardly in between: at once dominated by heritage styles, with a particular penchant for the Romantic era, while also fulfilling its statutory obligations by including a diversity of Australian composers, albeit by giving each of them only limited exposure.

While similar in many respects, the distinctions between modes of curation on each of ABC Classic FM and Spotify playlists are of particular significance to the domestic music sector. Spotify playlists collectively feature 63% less Australian content than ABC Classic FM, which suggests their increased importance for music discovery may limit the diversity of Australian content exposed to audiences. While the reach of Spotify has significantly more potential than broadcast radio, its curatorial processes draw on only a narrow range of Australian composers. Furthermore, those playlists which do feature high levels of distinctive and Australian content are not those which enjoy the sorts of high follower numbers which might otherwise make up for the limited breadth of these composers. Domestic content quotas in radio have been extensively advocated for due to their role in 'stimulating and maintaining local musical practice' (Mason, as cited in Gailey, 2012) and the analysis provided here lends support to calls by sections of the local music industry to introduce quotas for digital streaming services (Commonwealth of Australia, 2019).

When familiarity is considered from the perspective of the popularity of the music featured on different platforms, live concerts are again shown to be significantly more important in introducing audiences to music by lesser known composers. Whereas playlists and radio exhibit similar popularity distributions in terms of the output featured, the average popularity of discrete composers is substantially higher among the playlist dataset. The location of radio as a mid-point between the familiarity of playlists and the distinctiveness of concerts is reinforced in the distribution of distinctiveness scores. The distinctiveness data also shows that, on radio and playlists, Australian composers score significantly higher than their European and North American counterparts – even when only considered among post-modern era composers. This presents particular challenges for introducing audiences to contemporary Australian art music, but also provides a point of distinction for marketing Australian art music to international audiences. While the contemporary music of other nationalities curated on ABC Classic FM and Spotify bears some acoustic resemblance to the more familiar heritage music, Australian composers are presented as especially distant and distinctive.

Beyond the profiles of entire platforms, the analysis also establishes the importance of more specific contexts in which unfamiliar music is presented. From a time-of-day perspective, ABC Classic FM partitions periods of highly distinctive music to periods with low audiences – particularly weekend nights – which presents barriers for growing audiences. A similar pattern emerges in the context of specific radio programs and Spotify playlists, whereby a small number of curated programs are responsible for unfamiliar content. At a micro-level, the analysis of pairs of sequential broadcasts highlights the contrast between curatorial processes on each of radio and playlists. While each assembles music from a space of acoustic possibilities, radio is shown to pay substantial attention to the sequencing of music in a manner ignored by playlists. Again, the increasing relevance of digital playlists as a method for music discovery points to another impediment to encouraging users to engage with diverse music. Beyond the shift in agency from curators to consumers which is afforded by digital technologies, the art of programming itself is also diminished. Instead of audiences being taken on carefully constructed journeys which balance familiarity and novelty, listeners are left to navigate works with less guidance. It is unlikely that the curators of Spotify playlists, particularly the software engineers involved in those incorporating algorithmic selections, reflect the kinds of arts managers pursuing 'culture as a vocation' (Dubois & Lepaux, 2018). This shift in the social constitution of cultural intermediaries – with different motivations and backgrounds – warrants further investigation for its capacity to influence how the field is represented to audiences.

Within specific platforms, the capacity for individual curators to influence the representation of art music experienced by audiences was also demonstrated through the analysis of performers and their role in programming live concert events. In particular, enduring issues of gender equity can be understood in light of how the gender, size and type of the performer are significant in determining the gender of the composers programmed. Female and medium-sized performers are demonstrated as playing key roles in championing the types of risk-taking which are essential to both the ongoing health of art music and in introducing audiences to unfamiliar sounds.

The chapter also continues the thesis's theme of distance through the development of a novel methodological approach to measuring the notion of familiarity through the related concept of distinctiveness. Drawing on the model of acoustic similarity established in Chapter 2, distinctiveness provides a measure of the uniqueness of a composer in the context of either a particular platform or a subset such as an individual radio program or digital playlist. Beyond simple measures of presentation frequency or popularity, distinctiveness instead makes a link between familiarity, frequency and similarity. If music is acoustically similar to that of composers frequently heard on a platform, it suggests that it will have a degree of familiarity for audiences. Conversely, music which is acoustically distinct from frequently programmed composers is likely to be unfamiliar.

As a broad quantitative content analysis, the focus of this chapter has been on how particular modes of curation present the field to audiences by selectively drawing from and emphasising the space of cultural production. Beyond the proxy measures of familiarity, the ways in which audiences actually go about responding to and make sense of these different curations has been beyond the scope of this analysis. Chapter 4, however, picks up on these themes by attending to processes of listening to examine how and why audiences go about exercising their taste in contemporary Australian art music. The theme of distance again becomes central, as audiences grapple with processes of forming an attachment to music which seeks to be highly distinctive and, in doing so, evades familiarity.

4 ‘You don’t go to these kinds of concerts for fun’: The fluid and emergent performance of taste in contemporary art music

This chapter provides a case study of how musical taste is exercised in Sydney’s contemporary art music scene. As a cultural practice situated between the antagonistic oppositions of consecrated/novice and dominant/dominated, and whose very definition is keenly contested, contemporary art music represents an object of musical taste which is marked by ambiguity and tension. Drawing on interviews with concert attendees, the chapter considers how taste is put into practice and performed – both by choosing to listen and by formulating responses to particular works. Instead of the anticipation of pleasure which might be expected, it argues that practices of taste are typically more concerned with demonstrating solidarity and affirming positions within the contemporary art music. As a field with considerable overlap between producers and consumers, professional concerns are often entangled with the pursuit of their musical interests. When shifting to the level of responding to individual works, it identifies three different frames of appreciation – intellectual, affective and presentational – which participants variously draw upon to negotiate the performance of their taste. Instead of taste as something which fans can be said to possess, the study argues for the importance of understanding taste as comprising fluid, emergent and contingent strategies for engaging with the ambiguity of the field.

4.1 Introduction

The notion that we would derive pleasure from our musical interests is unremarkable. While the modalities of that pleasure might vary as people interact with different objects of their musical tastes – be it the transcendental enjoyment of opera, the nostalgia of rock, the euphoria of trance, or the intellectual appreciation of the avant-

garde – in all these examples, some easily identifiable form of satisfaction is being obtained by listeners. Indeed, for Bourdieu (1984, p. 86), the pursuit of pleasure is regarded as a precondition for successful acts of cultural investment. In the domain of contemporary art music, however, this predominant modality of enjoyment has been demonstrated as often being quite removed from common understandings of 'pleasure'. Whereas cultural tastes, particularly in domains with pretentions to 'art', are frequently associated with the mastery of competences which enable the symbolic appropriation and enjoyment of particular works (Bourdieu, 1984), contemporary art music complicates this connection between competence and enjoyment. Menger's (2017) study into the audiences of Ensemble intercontemporain (EIC), one of Europe's leading contemporary art music ensembles, found that 72% of audience members lacked the ability to discriminate among the various styles of contemporary works presented. The disorientation and discomfort which Menger found among many of the EIC attendees – who are generally among the elite socio-professional occupations (Menger, 2017, p. 129) – further disputes any idealised version of how supposedly sophisticated and learned audiences engaged with legitimate culture. Rather than the 'purified' and 'austere' mode of consumption which Bourdieu (1984, p. 272) associates with the 'pure aesthetic' of disinterested pleasure in such forms of culture (which Bourdieu regards as nevertheless serving its own *interest*), Menger's survey data instead suggests a 'benevolent asceticism' as the motivating force for people's engagement with and investment in attendance. The complication to common understandings of 'pleasure' suggested by Menger's study therefore invites greater scrutiny of how the operation of taste can be understood in more detail. Beyond the constellations of distances among producers examined in Chapter 2, and the selective assemblages analysed in Chapter 3, this chapter shifts the focus to how audiences achieve the performance of their musical taste in a field marked by distant and unfamiliar sounds.

The case of contemporary art music, in particular, provides a field of practice which sits at the intersection of a range of tensions relevant to the investigation of cultural tastes. In addition to occupying an ambiguous place in the old/new and high/low axes of taste distinction observed by Bellavance (2008), it is also situated between the sorts of dominant/dominated, consecrated/novice antagonistic oppositions in

Bourdieu's (1992, p. 239) structuring principles of artistic fields. The very contours of contemporary art music, and the labels used to describe it, are similarly contested. Broadly, it can be described as encompassing the contemporary incarnations of traditional classical music, through to experimental forms of jazz and improvised music, and disciplines which commonly identify as 'sound art'. It draws on its historical antecedents to establish its legitimacy, with much of the training of its composers and performers occurring within traditional music conservatoires; and, at the same time, it sits alongside contemporary forms whose legitimacy draws on claims to artistic novelty and connections to time and place. Furthermore, in the Australian context of the current study, the boundaries between high and low are increasingly contested among contemporary forms, as is evidenced in the growing set of musical genres supported by the Australia Council (Australia's federal arts funding body) and the ensuing inability for it to continue to fund as many 'high culture' organisations within its limited budget (Waks as cited by Griffiths, 2003, p. 9). Not only does this ambiguous status therefore provide a unique case study through which to investigate how these tensions emerge in the expression of musical taste, but it also reflects the broader trend of ambiguity in the definition of musical genres (van Venrooij & Schmutz, 2018) as objects of musical taste.

In researching the operation of tastes, the very question 'What are your musical tastes?' can itself be observed as both unremarkable and yet perversely awkward. Unremarkable, in that the enumeration and analysis of individuals' cultural tastes has long been a central concern to sociologists investigating how tastes, viewed as relatively stable and long-term preferences, are imbricated in various aspects of social life. In particular, Bourdieu's seminal analysis in *Distinction* pioneered multiple correspondence analysis (MCA) as a method for identifying the homologies between the social space of actors and their corresponding cultural interests as observed in 1960s France. A diverse range of studies has subsequently drawn on Bourdieu's conceptual framework for the nexus between taste and the social in other national and temporal settings (e.g. Bennett, Carter, et al., 2020) or with respect to specific topics such as omnivorousness (e.g. Savage & Gayo, 2011), social reproduction (e.g. Kraaykamp & van Eijck, 2010) and social stratification (e.g. Tampubolon, 2010).

The question is awkward, however, in that it is an artifice of the researcher. In the first instance, people rarely use the term 'taste' to enquire about people's musical preferences. They might ask about what kinds of music someone is 'into', enquire as to favourite music artists, or discuss what they 'listen to', but framing such questions in terms of 'taste' is at once both overly formal and also suggests that the interrogator is less concerned with musical interests and more with what might be interpreted as lying behind those interests. Secondly, the unity and stability of preferences implied by the term 'taste' can also be seen to crumble under the slightest scrutiny. The analytical assignment of tastes firstly risks overlooking the varying intensities of musical preferences. The nuanced configurations in which someone might mainly enjoy folk rock, but also occasionally goes to jazz clubs or listens to light classics, can go unnoticed in categorising users to broad genre categories. Committing to having a 'taste' for a particular style of music also suggests a homogeneity of appreciation which typically breaks down and fragments as individuals articulate their interests in any degree of detail. I like classical music (but mainly baroque and hate contemporary music). I like baroque (but only when played on period instruments). I like baroque music played on period instruments (but mainly French composers, except Boismortier is over-rated). This fragmentation of taste into increasing specificity does not even begin to account for all manner of contexts of listening and uses of music which further multiply the contingencies (I like listening to recordings of French baroque music played on period instruments when I'm at home by myself and I want to escape from the world).

This perspective, in which people's 'tastes' are increasingly fluid and contingent, reflects the 'pragmatic turn' to analysing cultural preferences pioneered by Antoine Hennion which aimed at "restoring the performative nature of the activity of taste, instead of making it an observance" (Hennion, 2005, p. 135). In addition to shifting from a concern with 'tastes' to 'attachments and practices', this program of research inserts a new form of agency into the analysis of preferences as the analytical focus moves away from Bourdieu's interest in cultural hierarchies. Rather than treating individuals as 'cultural dopes' who are wrong about what they do and need to be explained by the researcher's access to social theories, Hennion instead argues for treating the expression of tastes as a reflexive activity which demands giving far

greater respect to the multiple context and ways in which people enact their tastes. This approach echoes that of Latour (2005) in his critique of critical sociology and advocacy for a sociology of associations which places its focus on how 'the social' needs to be continually produced through the performance of mediating actors. His analogy of dance, "If a dancer stops dancing, the dance is finished" (p. 37), emphasises the role given to the performance and practice of taste as the preferred locus of analysis. An emphasis on how and *why* people derive pleasure from their musical tastes is also explored by Crossley and Bottero (2015), who draw on the notion of 'tuning in' to music as the acquisition of embodied know-how. They argue that the pleasure which is derived by fans can be understood in terms of their investment in agreed upon notions of achievement which act as 'conventions' specific to different musical styles.

This chapter draws on performative understandings of taste, and the multiple ways in which it is performed, as a means for examining the observed disjuncture between musical tastes and pleasure which occurs in particular domains. Focussing on the specific sub-genre of contemporary art music, as experienced in Australia, it analyses interview data from participants to consider how they discursively construct their engagement with the object of their taste. Significantly, the research interrogates the way in which taste is exercised at the level of responses to individual works. Prior to conducting interviews, the researcher co-attended a concert with participants, which permitted an analysis of the ways in which participants negotiate their varied appreciation of the specific objects of their taste. Importantly, this approach also restores a level of agency to the music itself. Rather than reducing music to a 'mere arbitrary cloak' (Hennion, 2015, p. 10) in the analysis of social forces, it allows a consideration of how the audiences variously engage with (or ignore) the specific qualities of the music which is the purported object of their interests.

The analysis firstly considers the ways in which participants discuss practising their musical taste through acts of listening. Whereas other cultural pursuits offer more objectified forms of realising one's taste, with Bourdieu (1984, p. 282) considering the purchase of works of art as the example par excellence, the temporal and often ephemeral nature of music points to different modes of pursuing these interests. In

addition to emphasising the importance of attending live events, the data point to the significant positioning work which is at play as participants choose to exercise their taste. This serves to affirm participants' own positions in the niche field of contemporary art music and can be seen as a microcosm of the broader types of social positioning which Bourdieu observes in *Distinction*. In doing so, however, the traditional modalities of 'pure aesthetic' or 'sensual' pleasure are largely absent from interviewee accounts, which are instead much more explicitly framed in terms of demonstrating solidarity with and supporting their own specific 'interest' in the specific cultural field of Australian art music.

The chapter concludes by considering the discursive strategies employed by participants in experiencing, making sense of, and evaluating specific musical works. The notion of taste as involving processes of *evaluation*, and the 'aesthetic principles' on which these judgements are made, has been argued by Hanquinet (2018) as under acknowledged in sociological accounts of taste. Hanquinet's emphasis on specific *aesthetics* of evaluation – such as her example of debates over whether video games belong in New York's Museum of Modern Art (MoMA) – is explored more fully in Chapter 5, whereas the current chapter focusses on how those evaluations are discursively (and fluidly) expressed. The predominant intellectual and affective frames which are employed, and the ways in which they serve to position participants in relation to the music, again draw parallels with Bourdieu's analysis in *Distinction* (1984) which respectively posits 'pure' and 'impure' taste as expressions of the interested relational positioning of individuals in society. Instead of the austere mode of consumption which Bourdieu commonly identifies in discussing avant-garde styles, however, I argue that the performance of taste in fields marked by ambiguity and tension demands a subtlety and nuance as participants switch between different frames of reference to enact their appreciation of contemporary art music. Furthermore, this shifting of discursive repertoires is also necessary to enact the ideal of cultural 'openness' (Ollivier, 2008) to which many participants aspire, while also allowing for the sorts of discrimination which are fundamental to musical taste.

4.2 Method

4.2.1 Participant sampling

The data analysed in this chapter comes from a series of semi-structured interviews with contemporary art music attendees in Sydney, Australia, conducted by the author between May and November 2017. The study sought to identify a sample of participants who had an existing interest in contemporary art music, while the interview format further required that participants had co-attended a concert with the interviewer, as their responses to specific works would subsequently form one of the topics covered in the interviews. An initial cohort of eleven participants was identified by the researcher attending a range of music concerts and festivals, and inviting attendees from a range of backgrounds to participate in subsequent interviews. An additional two participants (Grant and Peter) were later included to ensure that discourses involving two specific perspectives – those of philanthropy and broadcast media – were represented in the data; these two interviewees were referred by colleagues in the music sector and did not co-attend a concert with the researcher.

Despite the interview sample (see Table 4.1) being purposively selected to reflect a range of ages, genders and occupations, it nevertheless demonstrates a consistently high degree of formal music training, with only four participants (31%) not having completed a music degree. Rather than representing an anomaly of the sampling approach, this largely reflects the practitioner-dominated nature of the field which was often emphasised in the interviews and also alludes to the levels of particular forms of cultural capital which are necessary in order to have an interest in contemporary art music. The extent to which the sample can be said to reflect the wider population of contemporary art music patrons is difficult to assess given the paucity of detailed audience research in this area. Most industry (e.g. Live Performance Australia, 2018) and academic (e.g. Bennett, Dibley, & Gayo, 2020) surveys tend to subsume the category of contemporary art music into either ‘classical music’, which is dominated by heritage music, or ‘contemporary music’, which is dominated by non-classical genres. The Australian Bureau of Statistics (2019) surveys of attendance at cultural events similarly only distinguish between ‘Musicals or operas’ and ‘Live music concerts or performances’. Figures from a survey conducted by the author suggest that this high level of music training among contemporary art

music audiences is not unusual; of survey respondents who identified as having an interest in contemporary art music, 85% (n = 223) had a tertiary degree and 70% of those degrees were in fields of either creative arts or education.

Table 4.1 Interview participants

n = 13; male = 54%

Pseudonym	Age	Gender	Occupation/Sector	Music Degree
Amy	Mid 20s	Female	Music education	Yes
Belinda	Mid 30s	Female	Performer	Yes
Carolyn	Mid 60s	Female	Retired (media sector)	No
Grant	Early 70s	Male	Retired (marketing sector)	No
Holly	Early 30s	Female	Clerical	No
John	Early 50s	Male	Music journalism	Yes
Lloyd	Late 60s	Male	Composer	Yes
Matthew	Mid 30s	Male	Music education	Yes
Max	Mid 20s	Male	Education	Yes
Merilyn	Mid 50s	Female	Music education	Yes
Miles	Late 30s	Male	Clerical	No
Peter	Mid 50s	Male	Media	Yes
Romilly	Mid 30s	Female	Music education	Yes

4.2.2 Interviews and coding

Interviews were conducted in-person, in a setting of the participant's choosing and were of between 45 minutes and 2 hours in duration. Interviews followed a semi-structured format in which participants were asked to reflect on (i) their musical tastes generally; (ii) the origins of their interest in contemporary art music in particular; (iii) how and why they valued contemporary art music; and (iv) their responses to and evaluations of the music featured in the particular concert they had co-attended with the researcher.

The choice of in-person interviews for the generation of data was not based on any supposed correspondence with an underlying objective truth; rather they were regarded as giving the researcher room for 'active intervention' (Potter & Wetherell, 1987, p. 163), in which the contextual variability of participants' discourse can be probed in dialogic interaction. The emphasis, therefore, was on how people talk about their musical interests more generally, and capturing the variable discourses employed by participants as they articulate and perform aspects of their musical tastes. While much of the interviews sought to mimic how people might discuss a concert after attending together, it is acknowledged as unavoidably being an artificial environment of participants seeking to present a particular version of themselves to a researcher asking questions.

The analytical approach to interpreting the generated data sought to identify the rationales and interpretive repertoires which participants drew upon in making the evaluative judgements and justifications necessary for the performance of taste. Rather than any attempt to ascribe particular techniques or interpretive repertoires to individuals, the approach treated participants as capable of expressing multiple and contradictory discourses as they sought to variously position themselves and achieve particular outcomes through the discursive performance of taste.

4.3 Practising taste: Acts of listening

Beyond an act of identification with a particular style, genre or community, the concept of musical taste also involves acts of *practising* that taste – as a performative undertaking – through acts of listening. Listening is by no means the only way in which musical taste can be practised, with one participant, Miles, for example, discussing the importance of fashion in a way reminiscent of Hebdige's (1979) work on subcultures. Nevertheless, much research does operationalise and measure taste by counting acts of attendance or participation in various cultural fields and it can be assumed that choosing to listen is central to most people's attachment to their musical styles of choice.

As noted previously, however, the decision to exercise one's interest in contemporary art music is often substantially removed from the common conceptions of pleasure

which Bourdieu considers central to cultural tastes. Neither the 'facile' pleasure of the senses nor the 'pure' pleasure which has been purified of pleasure (Bourdieu, 1984, p. 86) corresponds to the types of ambiguity which typify contemporary art music's embrace of the distant and unfamiliar. Instead, the subsequent analysis focusses on the different kinds of rationales which participants draw upon in describing their choices to practise their interest in contemporary art music. For many participants, there is a 'taken for granted' aspect to their acts of appreciation, which they find difficult or perplexing to have to put into words. While this lends itself to the sort of 'Platonic illusion' which Bourdieu identifies as where "the pleasure of the love of art has its source in unawareness of producing the source of what produces it" (Bourdieu, 1983, p. 354), the interviewees frequently exhibit a cynicism which, if not quite venerating the 'trickery which places their fetish beyond critique' (*ibid*.), nevertheless provides a very different perspective on what it means to be a fan of this style of music. In addition to considering why participants choose to listen, the analysis also considers *how* they listen. Importantly for how taste is realised for contemporary art music, there is a consistent down-playing of the role of recorded music in contrast to the 'authentic' or 'quintessential' nature of live music attendance.

4.3.1 Choosing to listen

When participants reflected on their decisions for attending the concert co-attended by the researcher (or a recent concert in the cases of Grant and Peter), it is significant to observe that discourses of anticipated pleasure and affective enjoyment were largely absent from their rationales. The response of Romilly, a private music teacher in her 30s, as to why she and her partner decided to come to a particular concert provides a clear example:

> *Romilly:* *For us, it's a social thing. Sometimes we have to go because you need to see people and it's almost like work, you know? Like it's like turning up to a job on the weekend. I mean, I go, you know, to understand what other people are interested in musically, but you don't go to these kinds of concerts for fun. I mean, they're not really entertaining.*

In addition to consciously eschewing any notion of entertainment, Romilly's rationale also highlights the often blurred lines between producer and consumer which is found in contemporary art music's status as a restricted field of production, in which producers predominantly produce for other producers (Bourdieu, 1992, p. 217). From this perspective, it is perhaps unsurprising to see the expression of taste in relation to professional considerations of the benefits which are derived from participation. Max, who has aspirations to be a composer, is initially confounded as to questions of 'why' he is attending, but goes on to draw similar parallels to it being 'work', while attempting to retain a more positive perspective on his reasons for practising his taste:

> *Max:* *I guess I've never really thought about it in terms of, like, why was I there? (laughs) … It, it's almost like a, an expectation, in a way. I don't mean that in terms of like, a burden (laughs) … I enjoy listening to it most of the time, but I don't think that's the only reason why I go. I think it's also that sort of community and support. And also, somewhat an obligation, as well.*

A rationale of 'support' is frequently found among participants and includes both the notion of wanting to attend to lend their support to particular artists, such as in the cases of Belinda, Amy, Merilyn and Grant, together with others whose attendance was couched in a desire to show their support for the art music community more broadly. In both formulations, there is an idea that the particular artist, or the field generally, represents something of value which deserves to be validated by having an audience and which therefore leads them to attend. The notion of 'duty' can be seen in the way Carolyn, a retired radio producer in her 60s, defends and excuses her *not* practising her taste by not listening to a particular national radio program which is influential in the Australian art music community:

> *Carolyn:* *No, I don't listen to The Music Show. I'm at yoga on Saturday mornings and so I'm spared the, um, the duty of hav- [sic] … I don't have to listen to absolutely everything that moves.*

The anomalous nature of how musical taste is exercised in contemporary art music is also highlighted by considering the perspectives of Holly and Miles, who represent the participants with the lowest level of interest in the field. In describing why they will choose to listen to music in non-classical styles, they have no trouble in drawing on narratives of affective pleasure. Miles, for example, when talking of his interest in rock, says:

> *Miles:* *I would say it's pure enjoyment, fundamentally … you know, it rouses up the real experience. Even if you're just at home and bored, it's entertainment.*

The rationales provided by Holly and Miles for attending their respective art music concerts, however, were far removed from these traditional modes of engaging with music. In identifying her attendance as a social way of connecting with the interests of a particular group of friends, Holly joked that her occasional attendance at such concerts was about 'making myself feel smarter'. For Miles, attending was part of his long-standing interest in experimenting with exposing himself to different musical sounds. Choosing to listen is therefore closely tied to being able to practise his omnivorousness, as opposed to practising his interest in contemporary art music in particular.

A similar mindset, in the form of a desire to be challenged and confronted by the music they hear, can also be found among more seasoned art music fans. Rather than emphasising an extension of omnivorous listening habits, however, there is a more forthright desire to engage in specific forms of culture as enabling a sort of discipline of self-care. John, a music journalist in his 50s, for example, in identifying how he chooses what he listens to, says:

> *John:* *I don't want the things I already know – I want the things I don't know … You have people only in their echo chambers and, naïve starry-eyed person that I still am, I think that music can cut through that.*

In addition to serving to position himself in relation to where he feels musical value lies in the broader field, contemporary art music also offers John a way to expose himself to the unexpected in a calculated way to provoke a response.

Taken together, the various ways in which participants describe the ways in which they choose to practise their interest in contemporary art music are notable for their frequent omission of anticipated enjoyment and pleasure. While it was acknowledged that enjoyment could be derived by stimulating specifically intellectual faculties, the majority of participant discourse instead emphasised aspects such as support and loyalty to their chosen music scene (or artists within that scene), together with the social and professional opportunities afforded by exercising their musical tastes. This serves to disrupt the traditional links between the practice of cultural tastes and the anticipatory reward of pleasure, and instead points to the elevated importance of symbolic membership of particular scenes.

4.3.2 How to listen

In addition to narratives around *choosing* to listen, it is also interesting to note the way in which participants emphasised the importance of *how* they listen to music and the implications this has for the way in which taste is exercised in contemporary art music. Even among two participants who had worked in radio, there was a consistent valorisation of the importance of live music concerts as the quintessential, if not necessary, mode for engaging with the object of their taste. While the sampling of participants, having been recruited from attendees at new music concerts, will have helped shape the emphasis on live music, it is nevertheless instructive to note the way in which their taste serves to construct the field in ways which effectively omit recorded music.

The idea that live and recorded music offer qualitatively different modes of access to the domain of contemporary art music is shown in Amy's response to the question of whether she listens to recorded music:

> *Amy:* *I personally am of the opinion that, like, live, the experience of live music is far … well, for me, is far more interes- [sic] like, I still listen to music but it's like, it's vastly different.*

When expanding on the nature of the difference, Amy not only discusses the way in which she values the social and collective aspects of live music, but that she shifts from a terminology of 'experience' to one of 'listening' and 'consuming' when discussing services such as Spotify, which lacks the kind of carefully crafted program offered in a live concert. In this regard, recorded music – particularly digital services – is predominantly a functional tool for participants to research their engagement with the 'real' live scene. When Grant talks of using Spotify for discovery, it is not about making use of recommendation algorithms and playlists, instead it is about researching composers he has come across to determine if they warrant closer scrutiny.

Other narratives stressed that live music was essential for audiences to be able to develop a taste in contemporary art music. In responding to being told of someone listening to a recording of his music and dismissing it as 'weird', Lloyd (an experienced composer in his 60s) went to lengths to describe how the physicality of the live performance, as an extension to the aural musical experience, would have produced awe and interest:

> *Lloyd:* *Yeah, but the point is that he's only hearing a sound file. If he'd been in the room with us playing, he would be going 'Wow, that's pretty cool'. Like, seeing how Andy managed to drop like a sort of a saucer onto a ball, which ran off the end of his drum kit and landed on the floor and, you know, and then picked it up with a spoon and dropped it on a cymbal … So I think he would have been bowled over, actually.*

Recordings were commonly regarded as artefacts to prove that the music they valued had existed, as opposed to being something to listen to and practise their taste. Even for someone like Carolyn, who had previously worked in producing music for radio broadcast, she associates CDs with the idea of 'support' for particular artists and as offering only a pale imitation of experiencing music live:

> *Carolyn:* *I don't listen to very many CDs. Funnily enough, I buy CDs of new work. I bought a Splinter Orchestra CD recently to, you know,*

support the work they're doing. But I prefer being there. I think the live is incredibly important.

By drawing on a range of rationales which emphasise the importance of live music over recorded music in practising their taste, this enables participants to construct versions of contemporary art music which place value on modes of experimentation and performance which do not translate well to purely acoustic experiences. This mode of listening not only draws attention to a diverse set of factors which are involved in how people value acts of listening, but also suggests limitations on approaches which seek to understand music through purely auditory representations, such as approaches in the psychology of music and recommendation algorithms.

4.4 Articulating taste: Discourses of evaluation

Beyond taste as an engagement with a particular identifiable style of music, acts of listening inevitably also involve fans negotiating their responses to individual works within that style. Rather than treating a taste for contemporary art music as corresponding to a universal appreciation for all music fitting that label, the analysis instead turns to the ways in which value is variably attributed to different pieces of music. In particular, it is concerned with how taste is not only performative and positions participants in particular relationships, but also how it acts as a framework for interpretation. For all interviewees the music being discussed is, to some degree, unfamiliar to them in that the concerts selected all featured at least one world premiere. While they may have some familiarity with the composers, participants are nevertheless being asked to articulate their responses to novel sounds and they do so by drawing on a range of discursive repertoires for making their evaluations. This is acknowledged as a somewhat artificial task, particularly under the gaze of an academic researcher, and a number of participants employed strategies which either drew into question the very possibility of evaluation, or which sought to carefully negotiate a safe space for critique. While the idea of discussing the music you have heard at a concert might seem an obvious and natural thing to do, observations made by the researcher suggest that people are instead more likely to talk about anything *but* the music during intervals and at the concert's conclusion. Once engaged in the process of articulating their responses, however, participants were observed to shift

between three dominant rationales in making their responses: the intellectual, the affective and a third stemming from the presentation context of the concert. Whereas the first two rationales demonstrate a degree of correspondence with Bourdieu's previously discussed 'pure' and 'impure' modes of pleasure, the latter provides an additional discursive strategy for participants to avoid explicit critique of the music itself.

4.4.1 Avoiding evaluation

While a style with the moniker of 'art' music might be expected to embrace criticism and aesthetic debate, a substantial amount of time was spent by participants either placing the object of their taste beyond evaluation, or taking extreme care in identifying the position of the interviewer before venturing their own perspectives. In doing so, the concept of 'taste' was often used to qualify their reactions as personal opinions which didn't constitute a meaningful evaluation. Belinda, for example, initially refers to her 'personal taste as being a bit like a chameleon' to excuse making any judgements which go beyond a personal opinion of what she happens to like at any particular moment. Not only does this provide Belinda with maximum fluidity in the expression of taste, but it also implicitly denies that any such *evaluative* judgement outside of the personal could or should be made. Grant goes further in his antipathy towards 'the people who judge music' and affirms that the only valid judgements are those which he makes to serve his own interests. Both Belinda and Grant subsequently do, however, engage in a range of evaluations which are not based on an exclusively personal interpretation of taste and their doing so serves to position them in relation to both the researcher and the object of their taste. For Belinda, it largely allows her to avoid disagreement or confrontation and for Grant it positions him as almost magnanimous and 'open' in his reluctance to criticise.

A similar reluctance to evaluate can also be seen as stemming from an oppositional standpoint which largely rejects the importance of personal taste, which it instead seeks to overcome. Instead, it draws more on a discourse which has parallels with Ollivier's (2008) 'humanist' mode of openness to cultural diversity and which seeks to invert the object of critique from the music to the listener. The idea of trying to understand the music from the perspective of the composer was a strategy which a

number of participants identified with and this can be seen in Peter's self-reflexive mode of evaluation, which he identifies as a response to questioning his prejudice towards country and disco music while a music student at university:

> *Peter:* *I think one of the things of my young adulthood was a gradual process of a dialogue with myself saying everything that I hate is a challenge to understand why it's interesting.*

John gives a more impassioned and value-laden version of this viewpoint, in which he clearly positions his own omnivorous mindset in relation to others whom he effectively dismisses:

> *John:* *We've demonised this idea of submission. And you know listening is an act of submission. Reading a book is an act of submission. And when people say 'Oh, no, I listened to a little of that', you know, people hear a file on the internet – they listen to five seconds, get bored, they turn it down – 'It's not entertaining me'; or 'I started reading that book, it didn't do anything for me, it's boring.' I'm sorry, it's not about you, it's about it. I don't listen to music to gain pleasure from it, although ultimately I do, because I gain pleasure from learning about something I didn't know about – getting into someone else's head. That's exciting.*

Most participants engaged in some level of avoidance, skirting, or resistance to the idea of evaluation at some stage throughout the course of their interview and by doing so managed to position themselves variously as respectful, benevolent or empathetic in their engagement with contemporary art music. One respondent, Romilly, drew attention, however, to what was perhaps a crucial underlying issue – the perceived vulnerability of contemporary art music as being a reason for avoiding judgement:

> *Romilly:* *It's such a funny thing with new music, because I feel like you're almost not allowed to say, 'I didn't like that work, or I found it ugly.' There's this feeling that this music is almost like an endangered species. It's vulnerable, you have to protect it and so we can't be*

critical, and if you are critical, it's because you didn't understand it. Or you're stupid. So … I think that people are cautious. They reserve judgement.

Romilly's observations reinforce the previously identified influence of solidarity with a community of practice on the ways in which taste is expressed. Whereas Menger's (2017) Ensemble intercontemporain (EIC) audiences had the appearance of being ignorant in their lack of critical faculties, the present study points to a range of strategies which are being employed. These range from strategies which enable participants to enact particular modes of cultural openness to engage with their musical interests, to the social considerations of self-censorship and protecting potential professional opportunities by avoiding upsetting a smaller and more closely tied network than is the case with EIC. While avoidance was a common strategy, the analysis also identified a range of other contexts in which participants moved to more explicit evaluative frames of reference to practise their appreciation of contemporary art music.

4.4.2 Intellectual frame

The shift to evaluative frames of engaging with works reflects the need for participants' attachment to their chosen music to take a form which can be justified to themselves and others. A disavowal of evaluation can only go so far given the basis of tastes in practices which are, by their discerning nature, distinguishing at the level of preferred cultural works (separate to any theorised social distinction). Where participants did move to formulate particular evaluative responses to works, the dominant criteria for expressing such judgements drew on intellectual considerations. This is most clearly articulated by Lloyd, who, when reflecting on a concert remarked:

Lloyd: *That was the most inane, mediocre shit I have ever been to in 45 years … If that guy [the performer] can present me with an argument as to why that inane shit should exist, then I'll accept it. But he has no argument … You know, what's the relevance other than it's just part of a cut and paste sort of arbitrary lifestyle choice? You know, it could also be some lightweight, you know, I mean*

almost jazz; it could have been anything lightweight … It was irrelevant.

Lloyd explicitly rejects any idea that 'taste' (as personal opinion) is a relevant consideration and instead demands a coherent aesthetic rationale as the basis for discerning music which he deems valuable. By decrying the music as 'lightweight', he makes a contrast with the efforts and intentions of 'serious' music, with which he associates his own practice. Part of this concern with emphasising intellectual criteria, therefore, is that it facilitates an affirmation of his own conception of and position in the field. Lloyd's own work is highly experimental and informed by aesthetic arguments; by deploying intellectual propositions in responding to unfamiliar music encountered in a concert, he serves to reinforce the value of the brand of contemporary art music in which he is invested – his position in the *illusio* of the game – and against a broader set of communities with similar competing aspirations. Whereas Bourdieu (1984, p. 56) emphasises the violence of aesthetic intolerance stemming from differences located in broadly differentiated class habitus, the negation in Lloyd's dismissal points to the ways in which taste works to act as a process of distinction within even the smallest fields of practice.

The opportunities provided by intellectual frames to position fans is further demonstrated in the way Matthew takes issue with how intellectual arguments can be abused and serve as a form of window dressing which actually masks a lack of substance and rigour. Contrary to Lloyd's disgust at the lack of aesthetic principles, Matthew laments at how intellectual aesthetic arguments can be used to justify music of which he was highly critical:

Matthew: *What you're ending up with is an undisciplined, sloppy, second rate product that is being justified through political manifestos or through ideology … You used to be able to identify the charlatans from the real. But now they have legitimised their lack of discipline intellectually to the point where it's impossible to differentiate what is right and wrong.*

As with Lloyd, Matthew places value on intellectual rigour as necessary for guiding his tastes, however he is more despairing at the capacity for processes of artistic consecration to be suitably discriminatory. Matthew did evidently have a clear idea of what he felt was right and wrong, but despaired at the idea that there was effectively nothing beyond personal taste. Matthew was far from reactionary in his musical views, yet his perspective points to the relevance of the broader disruption to questions of legitimacy in the overall field of Australian music. While intellectual frames enabled him to affirm his convictions about his position in the field, he also admitted that it led to a withdrawal in terms of choosing to practise his taste.

It is significant to note that the auditory experience of the music is absent in these modes of evaluation, as it becomes abstracted to an intellectual endeavour which the listeners discern as being successful or not against a largely unspoken set of aesthetic principles. Carolyn, for example, expresses her negative reception of a particular work by stating that 'it wasn't conceptually a good idea'. Indeed, Carolyn demonstrates a common strategy of cordoning off 'taste', which she constructs as something personal and out of which she derives a form of affective enjoyment, as something which is quite separate to her ability to appreciate and find value in works based on an intellectual appraisal:

> *Carolyn:* *Their work is not to my taste, which doesn't matter. I still respect enormously the work that they do … it's always of the highest intellectual standards.*

In this perspective, there are no reservations expressed about the listener's capacity to make judgements about the value of the music in question, which is notable given Carolyn's previous assertion that she is 'completely uneducated in music'. This anomaly can be understood by placing such evaluations in discourses of respect and authenticity for *artists* which they hold in high (or low) regard, irrespective of the music itself. References to intellectual rigour are therefore commonly used to position the respondent in relationship to the broader field of contemporary art music. Belinda, for example, talks of the difficulty of hearing a particular work for the first time due to being confounded by it, but because of her strong regard for the composer, she is willing to invest in the time necessary to 'discover what I love about

the piece'. While the use of the term 'love' suggests an affective engagement, the subsequent language she uses clearly positions her response as being concerned with developing an understanding of what the composer is attempting to conceptually achieve in the construction of the piece.

This emphasis on 'understanding', whereby listening to contemporary art music is almost an interpretation game of perceiving the intentions of the composer, is often found in participant responses to specific pieces of music. When deployed, there is a tension in whether any lack of understanding is attributable to the fault of the listener in not understanding the piece, as opposed to it constituting a failure of the piece itself. The way in which this tension was balanced was not simply reducible to the level of music education and field-specific cultural capital possessed by the interviewees. Romilly and Peter, for example, both have postgraduate qualifications in music and yet oscillate between acknowledging their negative responses to particular works in terms of their own failures and judgements about the music itself. This can be attributed, in part, to the positioning game of finding a safe space for critique with the interviewer, with Romilly initially adopting a charitable stance towards a work:

> *Romilly:* *I don't know what to say about this piece … I couldn't piece it together. I was struggling to comprehend it. I was really trying to figure out what was going on and I wasn't the wiser. Like, by work's end … I was really confused.*

Once it became clear that the interviewer wasn't going to take issue with anything she was saying, she subsequently shifted the emphasis of critique to the music itself and the limited skill of the composer as being to blame for her inability to comprehend the music as a coherent work. Peter similarly moves from an initial personal focus of evaluation, whereby he emphasises his own failure to respond to the music, to one which subsequently affirms his critique as being attributable to failings of the particular composer.

The use of intellectual frames of evaluation, therefore, offers a range of discursive possibilities for participants to articulate and affirm their own position within the

field. By deploying this repertoire, the field of contemporary art music is constructed as a series of fragmented communities in which the expression of taste becomes a way of making often subtle yet clear statements about where objective value is said to lie. In this regard it is unsurprising that those who were most heavily invested in the field were more likely to utilise intellectual rationales, given they have most to gain by asserting their position in relation to others. Yet even respondents such as Amy, who was generally much more likely to draw on affective and presentation discourses in establishing her relationship to music, was also seen to turn to intellectual frames to justify her positioning of particular artists in the field.

4.4.3 Affective frame

The primary contrast to intellectual frames of reference in evaluating music was found in the use of affective frames which emphasised music's capacity to deliver enjoyment in the form of sensual or emotional pleasure. The fact that enjoyment can be derived from purely intellectual pursuits has been discussed above and the emphasis in this frame of reference is instead on instances where participants identify a more emotional basis for how they are evaluating the music in question. Whereas intellectual arguments lend themselves to discursive expression, putting affective responses into words was far more challenging for most participants. While they were able to identify positive and negative reactions, they frequently lacked the means to translate these into coherent statements. Merilyn, for instance, describes a 'warm and fuzzy feeling' she experienced from a work she enjoyed while Amy, who was typically comfortable engaging in detailed discussion of her musical interests, provides an example of how this struggle to express an effective response was manifested:

> *Amy:* *I really appreciated it as a concert. And um … yeah, it was like one of those evenings that for whatever reason afterwards, you just like, 'Huh'. You just feel good, whatever that means. I just thought it was really, um … just everything about it.*

The use of affective discourse was observed to be more common as participants were asked to formulate responses to music which had a higher degree of unfamiliarity for them. For contemporary art music, familiarity warrants a more intellectual mode of articulating taste along aesthetic lines, whereas more novice listeners will always

have recourse to their emotional reactions to formulate their responses. Miles, for example, typically values his musical interests in terms of their capacity to engage his intellectual curiosity; when reflecting on music he is less familiar with, however, he turns to more affective frames of reference:

> *Miles:* *It was enjoyable. I feel like there's something … I don't want to say magical, but there's something nice about hearing a grand piano play live acoustically. My mind was drifting.*

Music's capacity to transport listeners by enchanting and transfixing them was often identified in responding positively to individual works. In this regard, participants talked of effectively surrendering and giving themselves over to the music, thereby letting them be in another world. While such responses can be seen as reflecting intensely personal experiences of music, a number of participants did consider the capacity of music to deliver emotional satisfaction as being relevant to evaluating its success. Whereas Romilly largely deploys an intellectual frame for negative critique, when it comes to expressing her enjoyment of works, she defers to affective frames. She describes her enjoyment of opera, for example, as 'mindless and completely pleasurable', where she is able to let go of an analysis-oriented mode of listening. Her criteria for successful contemporary art music similarly draws on this mode of appreciation:

> *Romilly:* *I'd say successful works are works that … maybe you don't understand how it works, or how it's been put together, but it should have some kind of emotional satisfaction*

What affective responses do permit audiences to do is engage with the specific acoustic material of the music in a way which was rarely encountered in intellectual responses. In contrast to intellectual evaluations of the musical work as an abstract whole and in the context of a composer's oeuvre, respondents were able to reflect on specific musical material which engendered emotional or embodied responses. When discussing the work he enjoyed most from a concert, Max becomes animated in discussing a particular snare drum and the way it enabled the audience to 'feel and bop along to it', and Amy similarly talks in detail about the positive emotions elicited

by particular percussive sounds. In this regard, while the specific affective response may still be difficult to articulate, it is easier for participants to point to the specific musical material which elicits these responses compared to discussions of value based on music's intellectual merits.

The accessibility of emotional responses to all audiences, no matter their familiarity with particular works or the genre more broadly, is also used in evaluations which seek to emphasise the universality of music's appeal. While Lloyd disparages the 'no brain' antics of a performer who, in presenting his concert used phrases such as 'super cool', he later refers positively to (experimental) music which lay audiences can regard as 'cool' and accessible without the pretentions of high art. He develops an argument whereby he extols music which facilitates audience engagement by appealing to a veneer of familiarity as a hook to encourage a deeper curiosity. Importantly, however, the way in which Lloyd deploys affective frames is removed from his own personal evaluations and responses to music, and instead is projected onto others to strengthen his own position in the field.

4.4.4 Presentation frame

A third basis for evaluating music which emerged in analysing the interview data was that of participants drawing on the context of the work's presentation. Whereas the affective and intellectual modes were both identified in the exploratory factor analysis of survey data detailed in Chapter 5, the presentation frame emerged as potentially specific to the specialised and practitioner-dominated field of contemporary art music. Contrasting with the intellectual frame's focus on the composer as author, the presentation frame instead emphasised the contextual aspects of performer and venue as the basis for their judgements. Participants primarily drew on these frames to make negative critiques and often in a manner which avoided dismissing the potential value of the underlying musical work:

> *Matthew:* *The delivery was poor in that piece, so you can't really judge a concept based on a bad example.*

Max similarly attempts to place distance between any potential consideration of the merits of the music by emphasising that the venue and presentation context were not sympathetic to the music:

> *Max:* *Most of the pieces they played weren't designed to be played in the context they were playing tonight. Like, with all the [traffic] noise and everything. Um, which is like, fatal flaw number one.*

The presentation frame acts, therefore, in a manner similar to the previously identified strategies for avoiding evaluation. While the suitability of venues and the competence of performers are valid reflections when considering the presentation of contemporary art music, they also involve inserting distance into the space between the work and its evaluation. Rather than have to formulate a potentially difficult response to an unfamiliar work, this consideration can be backgrounded to instead engage in a more objective technical appraisal of the work's presentation. In the cases of both Matthew and Max, their technical critiques served to position themselves in a manner which was simultaneously championing the importance and value of the music which constitutes the art form, while lamenting the inadequacies and shortcomings which prevent it realising its potential. Indeed, they tended to reserve making these judgements for musical works which they otherwise wanted to find value in; for works which they felt only warranted derision, they would only employ intellectual frames of evaluation.

4.5 Discussion

For all participants, the decision to practise their taste in contemporary art music was remarkable for the absence or limited role played by the anticipation of common understandings of pleasure. This is in contrast to Bourdieu's 'illusio' of affective investment in legitimate culture, whereby the pursuit of taste is associated with the 'unconscious' and 'sincere enthusiasm' devoid of cynical calculation (Bourdieu, 1984, p. 86). Nor does the decision to exercise taste approach the sort of benevolent asceticism as suggested by Menger (2017), whose surveyed audience was engaged in a less experimental form of contemporary art music than those in the present study. Instead, the participants are often forthright in associating their decisions to attend

concerts as acts of solidarity or affinity with a community of practice. The salient aspect of distance is not so much a strictly musical one, but instead relates to a need to reinforce proximities among positions in the field. As Romilly observes in relation to people's reluctance to evaluate, there is a sense of vulnerability to art music practice which engenders a responsibility to attend. As a field in which the overlap between producers and consumers is often blurred, and in which much is made of the importance given to live public events (as opposed to the anonymity of recorded music consumption), attendance provides an important and socially recognisable way of affirming their position in the field. While contemporary art music might be considered a tiny specialised niche without room for much heterogeneity (one participant considered a concert with 20 attendees as constituting a good crowd), it nevertheless contains myriad sub-divisions and tensions, with participants vying over scarce funding resources and claims to legitimacy.

In contrast to solidarity, other participants did discuss exercising their taste as a source of a particular form of pleasure, largely in relation to the satisfaction from a mode of cultural openness. For John and Peter – both of whose long-term attendance at concerts is intertwined with their professional roles – they framed their practice of taste in terms of what led to their pursuing careers in the music industry in the first place. They share much in common with Ollivier's (2008) 'humanist' mode of openness to cultural diversity and with Peterson and Simkus's (1992) notion of omnivorousness as an ability to appreciate the aesthetic of diverse cultural forms. While both John and Peter present themselves with an omnivore sensibility, it is unavoidably evident that they regard contemporary art music specifically as offering the richest source for meeting this challenge. The pleasure may ostensibly lie less in the appreciation of the objects themselves and more in the process of challenging themselves, yet neither discussed spending much time listening to other styles of music. The inverse can be observed in Miles – who is predominantly a 'genre omnivore' within the specific domain of guitar rock and on occasion lets his pursuit of the unfamiliar expand to genres such as contemporary art music. Miles, Peter and John all ostensibly share a similar form of pleasure in pursuing their musical tastes – what Schwarz (2013) would consider 'tasting techniques' – yet the foci within which they enjoy them are markedly different. This is not simply in terms of different

musical styles, but also each style's level of cultural legitimacy. Rather than Schwarz's idea of a common *modus agendi* manifested in different material outputs but being traceable to common sociodemographic origins, Miles is from a lower middle-class background and has a clerical job, whereas Peter and John occupy a decidedly higher social status. While the present study is limited in its empirical basis in qualitative data, this discrepancy points to the need for further investigation into how the same mode of consumption across different cultural forms might be understood.

Once participants were engaging with specific works, they were shown to employ a range of discursive strategies to enable them to appropriate the music in a manner which supported them in practising the appreciation of their musical taste. In this instance, the aesthetic complexity which Menger (2017) identified as responsible for confounding audiences can be seen reflected in the discursive strategy of adopting affective frames to overcome a lack of familiarity with the stylistic codes deployed in the music. This is at odds with Bourdieu's conception of artistic contemplation and demonstrates the fluidity which is necessary for audiences to practice their taste. While responses to individual works can be variable, when participants have decided to exercise their taste they did typically seek to find ways of forming an attachment to at least some of the music in question; the affective frame's basis in emotions and perception provides a recourse for participants through which they can appreciate and value contemporary art music. Alternatively, participants also sought to avoid the premise of evaluation altogether. While this was often a precursor to subsequent evaluative practices, this discourse of avoidance frequently sought to partition 'taste' as limited to the 'chameleon' of *personal* taste – again stressing a fluidity which supports a personal connection to the music which only has to be justified to themselves.

The role played by intellectual frames in this analysis also offers a counterpoint to particular understandings of connoisseurship. For McClary (1989), the notion of the 'connoisseur of elite [avant-garde] music' is associated with the accumulation of specific and exclusionary forms of formal cultural capital. In this conception of autonomous art – maintaining an illusion of insulation from the social world – the encounter with the distant and intentionally difficult demands 'a special advanced

seminar in advanced analytical methods'. The ways in which both experts and novices were observed to engage with contemporary art music, however, provide a contrast to traditional ideas of connoisseurship capable of appreciating the 'terminal prestige' which McClary observes in the losing battle fought by the avant-garde. Intellectual considerations remain important, but their focus is less on an application of carefully developed scholarly learning and instead form part of what Hennion (2001) considers *orientations* towards objects which permit their appreciation. Rather than a close familiarity with and mastery of particular aesthetic codes, the intellectual frame was manifested more as an understanding of positions within the field and a capacity to reaffirm one's own. This reaffirmation also echoes the moral dimension implicit in aesthetic values (Hanquinet, 2018). For Lloyd, the strength with which he argues the merits of particular music is less about 'beauty' and more to do with the principles he believes are important for life.

The ambiguities and tensions within contemporary art music can also be seen as contributing to demanding a diversity of approaches to form attachments to the music. Whereas Lloyd enacts a version of taste which appeals to and affirms his own aesthetic position in the field, he simultaneously acknowledges the need to provide a mode of engaging with contemporary art music which has universal appeal. Rather than shifting rationales for his own engagement with music, Lloyd instead projects an affective and emotional basis on to how others can appreciate the same music. This points to an inversion of the previously discussed *modus agendi*; instead of a common technique applied to different cultural outputs, we instead have different modes of appreciating the same music. Whereas the previous context located social distinction in the object of musical tastes, here distinction does operate through techniques in a manner reminiscent of Bourdieu – 'pure' modes for those with high levels of cultural capital and 'impure' for less sophisticated audiences. Nevertheless, rather than an attempted 'universalisation of the particular case' (Bourdieu, 1992, p. 286) participants showed an awareness of the peculiar specificity of their chosen interests. When considering the accessibility of this music to others they shifted their conceptualisation of the field by emphasising the 'contemporary' and downplaying the 'art'. In doing so, the contemporary art music of their own tastes was conflated with a variant which acquired a new form of authenticity through its capacity to have a

broad relevance and appeal. This became something to incorporate into their own discursive strategies rather than simply negating the vulgarity implied by the 'natural'.

The 'pragmatic turn' in the sociology of music has opened up new ways of understanding the ways in which audiences form attachments to the objects of their musical taste. Rather than taste as something which is 'possessed' by a listener and which lends itself to be categorised by the analyst, the present study has emphasised the way in which taste in even a niche field of contemporary art music is nevertheless practised in fluid and heterogeneous ways. Rather than common notions of anticipated and derived pleasure, audiences are instead driven by both solidarity with particular positions within the field and the opportunity to fulfil a disposition of cultural openness. The various intellectual, affective and presentational frames used to engage with individual works, together with the avoidance of evaluation, all serve to facilitate attachment to the objects of taste in contexts marked by tension and ambiguity. In particular, it provides new ways for understanding audience engagement with music which is distant and unfamiliar. Importantly, this engagement is with an object which audiences are seeking to appropriate and enjoy as part of their musical tastes. While Hennion (2001) emphasises the performative practices through which passions are realised, the emphasis here on evaluative techniques retains a greater concern for tastes as culturally distinguishing practices. In this respect, the fluid performance of taste – realised through multiple frames of appreciation – is essential for its capacity to bridge distances and achieve an attachment to the unfamiliar.

5 Beyond familiarity: Modes of appreciation in the discovery, recommendation and engagement with unfamiliar art music

Sociological and psychological research into tastes has long explored how notions of familiarity and preferences are intertwined. This chapter seeks to go beyond this nexus by considering how and why individuals engage with unfamiliar cultural content. Focussing on the domain of Australian art music, it draws on a survey (n = 350) of respondents' musical preferences to obtain a more fine-grained understanding of the operation of musical taste and its intersection with the unfamiliar. It firstly demonstrates the considerable importance of music discovery as an orientation when consuming music. The study then draws on an exploratory factor analysis to identify three different 'modes of appreciation' by which audiences engage with and value music, comprising functional, emotional and intellectual approaches. It concludes by considering the implications for the design and development of algorithms which increasingly mediate our interactions with music. It argues that we need to go beyond familiarity when considering affective responses, to instead consider the ways in which different modes of appreciation intersect with specific styles of musical content.

5.1 Introduction

For those who create, present and disseminate music as both commercial product and cultural artefact, the problem of how to introduce listeners to unfamiliar sounds has been a long-standing challenge. The rise of the culture industries in 20th century consumerist societies has meant the need to grow audiences and markets has been a concern for those working in fields of cultural production, and in music specifically (Adorno, 1945, 2001). Further, the context in which this challenge is encountered has been transformed by the proliferation of digital music services and the models of consumption they support. Users now have on-demand access to libraries of over 30

million songs, with their listening habits helping inform machine learning algorithms that in turn recommend music that matches existing individual usage patterns.

As discussed previously in Chapter 3, algorithms, and the software engineers who design them, are increasingly acting as 'infomediaries' that shape how consumers discover and experience cultural content (Morris, 2015) and join other actors – curators, editors, programmers, accountants and policy makers – in the mediation of culture. The capacity of these new services to broaden access to musical expression is questionable. The world's largest digital music service, Spotify, reported that 20% of the songs available on its service have never been played (Palermino, 2014). As Nguyen, Hui, Harper, Terveen, and Konstan (2014) note, algorithmic recommendation can contribute to 'filter bubbles', constraining rather than broadening access. New audiences are fundamental to healthy art systems, and, with the advent of algorithmic influences, understanding how audiences engage with unfamiliar music is critical.

Dominant approaches in fields such as cultural sociology and music psychology, however, have typically used familiarity to explain preferences. Such theories risk circularity – 'we like what we already like' (North & Hargreaves, 2008, p. 88) – but also fail to account for when and how listeners deliberately engage with unfamiliar music. Through an examination of affective responses to contemporary Australian art music, this article examines precisely this liminal area, on the margins between the familiar and unfamiliar. Focussing on *how* people value and appropriate music, it examines how the interplay of these 'modes of appreciation' combine with familiarity and acoustic features to influence affective engagement. Whereas the previous chapter examined how the bridge to unfamiliar objects of taste is achieved through fluid strategies of appreciation, the focus here is on the notion of underlying aesthetic dispositions which structure people's orientations towards cultural objects. Instead of the micro-positioning which discursive strategies enabled, this latter approach provides a lens for considering how different dispositions towards art impact our capacity to engage with the unfamiliar. As well as extending a sociological understanding of the operation of musical taste, the article makes suggestions for algorithm development that can encourage listener engagement with the unfamiliar.

5.2 Theory

The concept of the unfamiliar can be observed in Meyer's (1956) pioneering work in musical aesthetics. Working from the psychological notion of intellectual uncertainty, he postulated that embodied musical meanings are a product of expectation, which in turn, is a product of stylistic experience. In linking familiarity to an expectation born of experience, Meyer further argues that "music in a style with which we are totally unfamiliar is meaningless". An association between unfamiliarity and a sense of being disoriented is similarly found in Bourdieu, who observes the intellectualist theory of artistic perception in which the mastery of particular codes is necessary to avoid the beholder being "lost in a chaos of sounds and rhythms" (Bourdieu, 1984, p. 2). In emphasising the idea of 'codes', Bourdieu shifts the emphasis of familiarity from a concern with individual works to the logics which govern particular periods, schools and authors, and the corresponding cultural competencies necessary to both recognise and appreciate the respective works within them.

The link between familiarity and expectation can also be observed in music information retrieval literature. The inputs available to an algorithm making a recommendation of a novel work will necessarily be without detailed data on a user's familiarity with each candidate unheard item. The customary way of addressing this is through the use of collaborative filtering and content-based approaches which, respectively, seek to find the items most familiar to a user's social networks or similar to their own past consumption behaviour. In the case of the latter, acoustic feature analysis techniques extract a range of descriptors from the audio signal, which can then be used to statistically assess the similarity between different items. In this way, music which is acoustically similar can be regarded as offering similar patterns of expectation and provides a surrogate for familiarity. There is a contradiction to overcome, however, in that while novelty and serendipity have been identified among the metrics which should be considered in evaluating the effectiveness of recommender systems (Aggarwal, 2016, pp. 233-234), the importance of achieving 'accurate' recommendations has meant a reluctance to incorporate novelty into the design of algorithms (Ge, Delgado-Battenfeld, & Jannach, 2010).

The concept of familiarity can be measured along two distinct continuums. The first concerns the degree of familiarity with a *code*, such as the field of contemporary Australian art music practice studied here. This continuum spans listeners familiar with its particular aesthetic forms, those familiar with the broader codes associated with classical music, and those unfamiliar with classical music at all. Secondly, there is a continuum which applies to the specific work being encountered by the listener. For those invested in contemporary art music, engaging in processes of music discovery can span works and composers very familiar to music they appreciate, through to works where the listener's sense of musical expectation and intellectual certainty is increasingly confounded. For those with minimal knowledge of contemporary art music, they will nevertheless encounter works that adhere to familiar musical codes and forms.

The link between familiarity and the capacity to construe meaning from works has given rise to a range of theorisations which seek to explain taste in terms of familiarity. In cognitive psychology, the investigation of taste has frequently been framed in terms of 'preferences', with Juslin (2013) defining the object of this domain of research as 'low intensity, long-term, affective evaluations for items'. While affect itself is measured through instruments ranging from attitudinal Likert scales (Margulis & Simchy-Gross, 2016) to facial electromyography (Gerger, Leder, & Kremer, 2014), the underlying explanatory frameworks of such investigations frequently draw on psychological mechanisms relating to familiarity. From Berlyne's (1971) influential work on the role of the limbic system in producing reward effects, through to concepts such as mere exposure (e.g. Witvliet & Vrana, 2007) and prototypicality (e.g. Martindale & Moore, 1988), a variety of formulations claims to account for how preferences are guided or otherwise related to familiarity.

For cognitive approaches, the idea that there might be patterns which explain some of the variation in affective responses across different individuals is typically of less concern. If this variability is not subsumed within the confidence intervals of statistical analysis, it can otherwise be explained in terms of factors such as stable personality traits (Rentfrow & Gosling, 2003). Research approaches stemming from critical sociology, conversely, do seek to address the external origins of taste and

provide an alternate lens through which the link between familiarity and taste can be theorised. Bourdieu's (1984) work in *Distinction* has been an influential example, in which he posits homologies between the social space of actors and their corresponding cultural interests – locating the sense for what is preferred in practices that are socially inculcated as well as embodied.

In all the above formulations, however, there is an element of circularity which limits their utility in considering listeners' engagement with specifically unfamiliar music. Bourdieu's framework, for example, emphasises the formation of dispositions which serve to reproduce the social, and so assumes a field of already existing and culturally acknowledged items. In Lembo's (2016) analysis of people's later-in-life acquired taste for honky tonk music, she argues that Bourdieu's concern with explaining stability (and dispositions already formed) is ill-suited to investigating the acquisition of tastes, as it would demand significant 'moments of disjuncture' to trigger re-habituation and the development of new competencies. Such a theorisation is therefore too broad and heavy-handed to offer a lens through which to analyse people's less intensive engagement with unfamiliar music.

Whereas Lembo's response is to draw on Dewey's theorisation of 'experience' to overcome this gap, an alternative approach is found in research which focusses less on the 'what' of cultural tastes and instead draws attention to the modes of appreciation through which taste is exercised. Bourdieu himself does draw a distinction between his concepts of *opus operatum*, which constitutes the 'structured products' which are the objects of our tastes in particular fields, and the *modus operandi* which represents the governing structuring principles of taste and which can be transferred from one field to another. The contrast between the two is highlighted in the critique which Bourdieu (1984, p. 573) makes of social psychology for its 'atomistic approach' which seeks partial laws accounting for the *products* of practice, as opposed to general laws concerning *processes* of production. Bourdieu uses the same terminology of 'structuring structure' to refer to both *modus operandi* and to the habitus itself. Just as the habitus is 'internalised and converted into a general and transposable disposition' (p. 170), modes of appreciation can be considered as the expression of the *modus operandi*.

While Bourdieu's concern with homologies between cultural taste and social power leads to this interest being more in processes of structuring than specific principles of appreciation through which taste is exercised, an emphasis on the latter can be found in the 'pragmatic turn' of Hennion's sociology of attachment (Hennion, 2005, 2012). As with Lembo, Hennion takes issue with the static conceptualisation of taste which dominates critical sociology and instead argues for an emphasis on the ways in which audiences form attachments to the objects of their interest. Importantly, this approach also offers new forms of agency to the objects of taste themselves. Rather than being reduced to arbitrary conduits for social forces, it permits a 'return to the work' in their role in the mediation of music. Much as this pragmatic turn motivated an interest in the acoustic features of music in Section 1.4.2, in the context of the present study it allows a consideration of whether particular musical characteristics within the diversity of Australian art music offer particular affordances for audiences to form positive responses.

The idea of a mode of appreciation which might be more inclined towards the unfamiliar can be found in the concept of the 'cultural omnivore'. Observed in the omnivorous sensibility which emerged in the performance of taste in Chapter 4, Peterson (1992) originally associated the concept with a capacity to appreciate the aesthetic of diverse cultural forms. Whereas Bennett et al. (1999) argue that this 'omnivore' represents more of a knowledge base than any real affinity for diverse music, the ability for omnivorousness to form a particular mode of appreciation is developed by Ollivier (2008) in her analysis of the different discourses which underlie the attitudes of people whose consumption habits would classify them as omnivores. In particular, her 'humanist' mode of cultural openness suggests a form of mobility across cultural forms which places a high value on discovery as a means to learn and stimulate the mind. Ollivier did not identify this mode – and the high levels of cultural capital it demands – as simply some enlightened approach to culture, but instead argued that it represented a reconfiguration of previous social and artistic hierarchies. Jarness (2015) employs a similar focus in shifting from *what* people prefer, to instead examine *how* people appropriate cultural goods as 'modes of consumption'. Contrasting modes in which consumption is an end in itself (both the aestheticising *intellectual* and material-oriented *luxurious* modes) and those where

consumption is a means to an end (the culturally novice *educational* and functional *practical* modes), Jarness locates these different modes in class-based social stratification. This echoes the interest of Schwarz (2013) in the capacity for 'tasting techniques' – as embodied styles of attending to cultural objects – to provide a conceptual bridge between Bourdieu's sociology of *taste* and Hennion's sociology of *tasting*, and form a new avenue for enquiry through which to examine the operation of taste.

A focus on modes of appreciation is also found in quantitative analysis, with Roose (2008) utilising factor analysis to examine survey responses of classical music audiences. Building on work by van Heusden and Jongeneel (1993) in establishing the 'semiotic functions' of music, Roose identified separate emotional, escapist, familiarity, normative and innovative functions, which are taken to represent aesthetic dispositions. The innovative function – reflecting engagement with the unfamiliar – is shown to be most important to the 'inner circle' audience segment of frequent concert attendees and corresponds to the kinds of intellectual frames of evaluation observed in Chapter 4. More recent survey research by Daenekindt and Roose (2014) similarly demonstrated that distinction among art museum visitors can be located in 'ways of preferring'. Focussing on aesthetic dispositions as opposed to more embodied forms of tasting technique, the authors compared the capacity for 'taste profiles' (based on latent class analysis of the appreciation of named artists) and 'ways of preferring' (based on exploratory factor analysis of Likert-scale responses to questions pertaining to aesthetic dispositions) to be aligned with socio-demographic variables. They observed that it was the modes of appreciation – the critical, functional, modernist and postmodern dispositions they identified – and not the objects of art which were socially distinctive. A similar approach is adopted by Hanquinet et al. (2014) in their use of multiple correspondence analysis (MCA) to identify a series of oppositional axes of aesthetic preferences among art museum attendees. As with Ollivier, their research points to the new ways in which Bourdieu's conception of fields are currently being reconfigured and introduces new levels of complexity which go beyond a highbrow/lowbrow dichotomy. Together, these various formulations of aesthetic dispositions provide a reference point against which to compare the 'modes of appreciation' identified in Section 5.4.2 below.

This study's concern with unfamiliar music required a theorisation of taste which goes beyond familiarity and the logical impossibility of an appreciation of the unfamiliar being explained through habitual practices. The concept of modes of appreciation offers an approach with the potential to circumvent this and also provides a connection to the idea of the cultural omnivore and how processes of distinction may be undergoing reconfiguration in contemporary societies. Finally, the 'return to the work' found in the sociology of attachment points to the potential for examining the particular characteristics of individual works and the affordances they provide in eliciting positive affective responses.

5.3 Data and methodology

5.3.1 Analysis overview

The approach to empirically investigating people's engagement with unfamiliar music in this chapter is to establish firstly the extent to which people engage in processes of music discovery. While discovery oriented behaviours can involve listening to music which spans high and low degrees of similarity to the stylistic 'codes' with which users are familiar, it nevertheless provides an overview of the extent to which listeners adopt an orientation towards discovery as a modality of consumption, which broadly reflects a mode of cultural openness associated with omnivorous cultural tastes. A more explicit consideration of modes of appreciation is then undertaken through an exploratory factor analysis (EFA) to identify latent variables from a series of statements about how participants relate to, value and incorporate music into their everyday lives. The EFA draws in particular on the work of Daenekindt and Roose (2014) to adapt their investigations of museum patrons to the context of music audiences.

The modes of appreciation identified in the EFA then become potential explanatory variables in modelling the affective responses of participants to a series of audio samples of musical works recommended to them based on a variety of custom developed algorithms. Participants also provided familiarity ratings of each sample, enabling modelling of the interplay between individual modes and familiarity, while also considering the characteristics of the music being recommended and other

demographic variables. The modelling approach is exploratory in nature and seeks to find fixed, random and interaction effects which provide a best fit to the data, as opposed to testing specific hypotheses; this allows for a more comprehensive assessment of the roles played by variables and their interactions. The modelling also considers implications for recommendation algorithm development by extending the discussion of acoustic similarity and distance in Chapter 2 through an analysis of the extent to which measures of acoustic similarity can provide a proxy for familiarity.

5.3.2 Contemporary Australian art music

While the field of contemporary Australian art music constitutes a specialised niche, it nevertheless reflects a heterogeneity of styles – contemporary classical, experimental jazz and improvised musics, and sound art – well suited to analysing the continuum of listener familiarity with codes and schemas of perception. Beyond binary participant cohorts who are either familiar with this scene or who have no familiarity with any forms of classical music, this field also permits identification of a third cohort with an intermediate level of familiarity stemming from their existing interest in non-contemporary classical forms. Even for the cohort of participants who are knowledgeable of contemporary Australian art music, its heterogeneity provides scope for engaging with music which represents varying degrees of familiarity.

While industry and academic research tends to subsume this genre's audiences within either classical (which is dominated by heritage forms) or contemporary (which is dominated, conversely, by non-classical forms), findings from the present study's survey suggest they are highly educated and endowed with considerable levels of field-specific capital. Of respondents who identified as having an interest in contemporary Australian art music (n = 217), 87.6% had a bachelor degree or higher, compared to just 22% of the Australian population (Australian Bureau of Statistics, 2017). In addition to very high levels of education, that 71.2% of those degrees were in either creative arts or education points to the specific forms of cultural capital which are customarily required to engage with the field.

5.3.3 Survey instrument

Data was collected through an online survey conducted in October 2018, which asked users questions pertaining to musical preferences and behaviours. The survey also obtained participants' evaluations of a personalised set of nine music recommendations, selected by algorithms and presented as 30 second audio samples. The final set of questions profiled each respondent in terms of demographics and measures of cultural and social capital.

Recruitment for the survey aimed to obtain three cohorts of participants with varying familiarity with and interest in the sub-genre of Australian art music. This ranged from novices, those with an interest in classical music styles generally, and those well acquainted with contemporary art music. The populations for these different cohorts of listeners are unable to be accurately determined; given the resulting inability to obtain a representative sample, the approach employed instead sought to obtain indicative groups of participants. The cohort of high familiarity users were recruited though a mailing list of the Australian Music Centre[44], with invitations to participate in the survey sent to 5,469 email addresses, resulting in a click-through rate of 18.8% (n = 1,027). Links to the survey were also published on the websites of both ABC Classic FM[45] and APRA[46], in an attempt to enlist participants with traditional classical and non-classical contemporary musical interests respectively. 350 complete responses were received in total, comprising 217 who expressed an interest in Australian art music (the high familiarity cohort), 45 who otherwise indicated an interest in traditional classical music (the general classical cohort), and 88 identified as interested only or mainly in contemporary (non-classical) styles of music (the novice cohort). The completion rate was 84.3%, high for a survey of this kind. The resulting sample can be expected to have a higher degree of overall interest in music than the general population; given the study's focus on engagement with unfamiliar

[44] The Australian Music Centre is a national service organisation promoting Australian art music. Its mailing list subscriber base is made up of people who have elected to receive news and updates about this music scene.

[45] ABC Classic FM is Australia's largest classical radio network, broadcasting predominantly pre 20th century music.

[46] The Australasian Performing Right Association (APRA) is a collective rights management organisation whose members are predominantly song-writers.

music, however, the omission of participants who infrequently consume music has little consequence for its results.

The demographic variables captured for each respondent included operationalisations of both social and cultural capital. The former draws on the approach taken in the Great British Class Survey (Savage et al., 2013), asking participants to nominate if they socially knew people from 28 occupational categories. The categories were selected using Australian Bureau of Statistics data (Australian Bureau of Statistics, 2011) to identify those with the largest workforce participation, for each gender, across various bands of social stratification. Stratification was measured using the CAMSIS-OZ scale (Jones & McMillan, 2001), which is an Australian adaptation of the Cambridge Social Interaction approach (Lambert & Prandy, 2018). The number of occupations reported and the mean status score of reported occupations were then derived as measures of social capital. The CAMSIS-OZ stratification score of the participant's occupation was used as an indirect measure of cultural capital. These variables were all scaled to values between 0 and 1 to simplify interpretation in analysis.

5.3.4 Music recommendations

The musical material utilised to make recommendations to participants was drawn from the recorded music collection of the Australian Music Centre (AMC). This collection, comprising 14,000 recordings by approximately 750 different composers, provides excellent coverage of the Australian art music sub-genre. In selecting recommendations to make to survey participants, two broad approaches were implemented. The first drew upon different notions of 'successful' composers as the basis for making recommendations. Regardless of the stated musical preferences of the user, these approaches selected samples of works by composers who met one of

three separate criteria: (i) commercially successful; (ii) high levels of symbolic artistic prestige[47]; or (iii) most central[48] in the field.

In contrast to these generic approaches, another algorithm sought to deliver personalised recommendations in a manner similar to content-based recommender systems by recommending the music of composers who share the highest acoustic similarity with each participant's own musical preferences. These preferences were obtained by asking respondents to nominate five of their favourite composers or musical artists which reflected the diversity of their musical interests. A database of acoustic similarity was developed by subjecting the AMC recorded music collection, together with the iTunes catalogue of 64 million song samples, to acoustic feature analysis and extraction (Bogdanov et al., 2013). The multivariate distance (as a measure of similarity) was then calculated between each of 800,000 artists found in iTunes and each of the composers in the AMC's collection. Participants' nominated composer/artist preferences were then matched in real-time to this database. This supported generating individualised recommendations by identifying the Australian art music composers most similar to the preferred iTunes artists. For each recommended 30-second sample of music, participants were asked how familiar they found the music and how much they liked the music. Both responses were recorded on a 7-point Likert scale.

5.4 Results

5.4.1 Discovering new music

The extent to which participants engage in process of music discovery provides a useful starting point for considering engagement with unfamiliar music. Participants were asked to nominate how frequently they used eight different recommendation

[47] As detailed in Section 3.3.5.1, the calculation of artistic prestige is based on a formula which takes into account (i) the number and stature of artistic awards received; (ii) the number of commissions received and the stature of each commissioning body; (iii) the value and number of grants awarded by the Australia Council for the Arts (the federal government's arts funding body).

[48] As per the analysis in Section 2.4, centrality is calculated based on the degree-centrality of composers in curatorial networks of concert programs and commercial CD releases.

sources[49] for discovering new artists and composers (see Table 3.1). Table 5.1 shows the overall frequency of music discovery behaviours for participants by considering only their most frequently used recommendation source. While the survey is biased towards a sample which is already disposed towards valuing music in some way, these results nevertheless point to the importance of discovery as a mode of consuming music, with over half of respondents identifying as engaging with processes of discovery on at least one platform on a weekly or daily basis.

Table 5.1 Maximum frequency of using any of eight sources for discovering new artists and composers
n = 326

	Never	Less than once a month	Monthly	Weekly	Daily
Maximum frequency	1%	15%	29%	38%	17%

The data also point to music discovery becoming less frequent as people age. Model 5.1 uses ordered logistic regression to predict the frequency of music discovery based on both age and the degree to which they consider themselves to have an awareness of different musical styles (as measured on a 7-point Likert scale). Expressed in log-odds, the terms include both the shift in likelihood for unit changes in each independent variable, together with the cut-points at successive ordered categories. This effect of age in this model is visualised in Ordered logistic regression formula: Discovery Frequency ~ Age + Style Awareness

Figure 5.1, which shows the resulting trends whereby the likelihood of low-frequency categories (such as Never and Less than once a month) increase with age, whereas the inverse is true for both Daily and Weekly intensities of discovery.

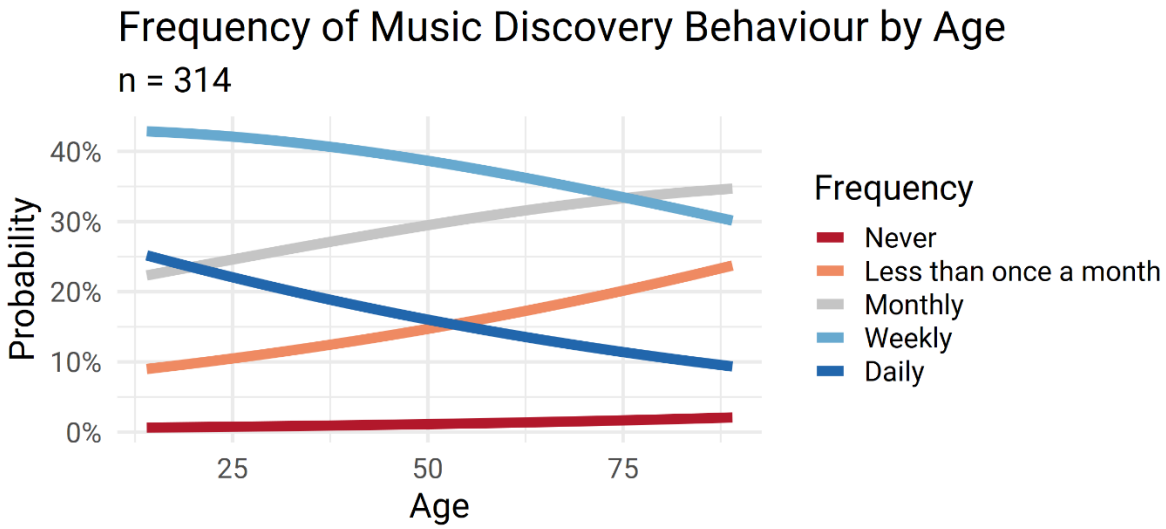
[49] The platforms surveyed were Radio, Festival or concert, Music journalism, Social media, Playlist on a digital music service, Suggestion from a digital music service, Podcast, Recommendation from a friend.

Model 5.1 Predicting frequency of music discovery behaviour by age

Term	Coefficient	SE	T-statistic	P-value
Age	-0.016	0.007	-2.34	0.019
Awareness of Musical Styles [1-7]	0.243	0.065	3.72	< 0.001
Cut-point (Never | < Monthly)	-4.007	0.702	-5.71	< 0.001
Cut-point (< Monthly | Monthly)	-1.214	0.517	-2.35	0.019
Cut-point (Monthly | Weekly)	0.268	0.510	0.53	0.599
Cut-point (Weekly | Daily)	2.112	0.522	4.05	< 0.001

Ordered logistic regression formula: Discovery Frequency ~ Age + Style Awareness

Figure 5.1 Frequency of music discovery behaviour by age



An orientation towards engaging in music discovery as a modality of consumption broadly reflects the notion of the cultural omnivore. The data lacks the granularity to consider classical understandings of omnivorous behaviour, whereby consumers traverse styles representing a diversity of social hierarchies, however it does identify a psychological effect whereby consumption habits tend to become more fixed in older age. Rather than an accumulation of encyclopaedic knowledge, this limited interpretation of omnivorousness points to younger audiences figuring out their interests before musical tastes solidify in older age. Furthermore, while there is ambiguity in the causal direction in the effect whereby increased frequency of

discovery activities is associated with increased awareness of different musical styles, Model 5.1 shows that an inclination towards discovery is more likely to be found among those with more diverse musical knowledge. Conversely, the failure for any measure of social or cultural capital, or the cohort of participants' musical interest, to constitute significant effects in the model, indicates a lack of evidence to support the idea that an orientation towards music discovery, as a modality of consumption, can be understood through different modes of socialisation (beyond a possible reduction in socialisation associated with age).

5.4.2 Modes of appreciation

As discussed, considerable attention has been paid in cultural sociology to the different 'modes of appreciation' through which individuals engage with and value cultural objects. The current study draws particularly on the study by Daenekindt and Roose (2014) into art museum audiences, by adapting and extending their approach to focus on ways of preferring in the specific context of musical consumption. Drawing on the different approaches to music consumption found in music psychology and sociology of music literature, the survey asked 14 questions (see Table 5.2) which aimed to elicit the various ways in which respondents relate to, value and incorporate music into their everyday lives. Responses were captured using a 4-point scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (4).

Table 5.2 Statements on modes of musical consumption

#	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Resp. Rate
1	Having a similar taste in music often helps me relate better to friends and colleagues [social]	23	87	151	50	89%
2	I am able to enjoy most musical styles or genres [enjoy]	11	67	171	92	97%
3	Music doesn't have to sound beautiful [beauty]	30	42	156	108	96%
4	I find it difficult to enjoy music unless I feel I understand it [understand]	72	193	55	17	96%

#	Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Resp. Rate
5	It is important that music moves me emotionally [emotion]	13	101	161	52	93%
6	Whether music is good or bad is a matter of personal opinion [opinion]	22	93	133	85	95%
7	I often choose music which will help change my mood [change-mood]	19	116	155	33	92%
8	There is no such thing as bad music [no-bad]	145	133	25	19	92%
9	Listening to certain types of music helps me think [think]	24	67	162	69	92%
10	I often listen to music as an escape from everyday life [escape]	29	89	122	85	93%
11	Generally, it is important that music challenges me in some way [challenge]	17	119	137	42	90%
12	I can believe music is important without necessarily liking it [important]	7	18	195	110	94%
13	Typically, it is important that the music I listen to matches my mood [match-mood]	27	155	106	33	92%
14	It is important to listen to music which is of our time and place [time-place]	78	92	92	64	93%

There was an overall lack of correlation between the responses when treated as ordinal variables, with the strongest Kendall tau correlation coefficient at just 0.37 ($p < 0.001$) for the level of agreement between statement 10 (“I often listen to music as an escape from everyday life”) and 9 (“Listening to certain types of music helps me think”). The absence of strong positive (or negative) correlations confirms that each

of the questions captures a discrete aspect of the ways in which people value and relate to the music they consume.

An exploratory factor analysis (EFA) was conducted to analyse the relationships between the ordinal responses to the statements, using polychoric correlation matrices (Holgado–Tello, Chacón–Moscoso, Barbero–García, & Vila–Abad, 2010). EFA permits the identification of latent variables ('factors') together with the ways in which the original variables combine to produce each factor ('loadings'). The number of factors was selected using the parallel analysis criterion method of Humphreys and Montanelli Jr (1975), which involves assessing the scree plot of the observed data against a random but equally sized data matrix, and has been demonstrated as performing well compared to the common alternative of using eigenvalues. The resulting four factors were subjected to VARIMAX rotation to aid interpretation, with the final factor loadings detailed in Table 5.3. The analysis follows Hair, Black, Babin, and Anderson (2019, p. 175) in using a loading cut-off point of ±0.4 for a variable to be included in the interpretation of a factor.

Table 5.3 Exploratory factor analysis loadings

#	Statement	Factor 1 Functional	Factor 2 Affective	Factor 3 Intellectual	Factor 4 Hierarchical
1	[social]	0.17	0.00	0.03	0.12
2	[enjoy]	0.28	-0.30	0.33	0.13
3	[beauty]	-0.04	-0.38	0.74	-0.01
4	[understand]	0.02	0.47	-0.06	0.04
5	[emotion]	0.21	0.64	0.03	0.04
6	[opinion]	0.15	0.16	-0.03	0.96
7	[change-mood]	0.54	0.22	-0.02	0.16
8	[no-bad]	0.01	-0.03	0.08	0.34
9	[think]	0.59	0.04	0.06	-0.03
10	[escape]	0.77	0.20	-0.03	-0.02
11	[challenge]	0.09	-0.04	0.49	0.09
12	[important]	0.09	0.02	0.38	0.07
13	[match-mood]	0.25	0.44	-0.24	-0.05
14	[time-place]	-0.17	-0.01	0.49	-0.04

Loadings below -0.4 and above 0.4 are highlighted
Factor labels are interpretive based on the discussion below

The first factor demonstrates substantial loadings from statements which reflect largely *functional* uses of music: to alter mood, to help think and to escape everyday life. The second factor places value on the *affective and emotional* capacities of music: as something which should sound beautiful, stir emotions and correspond with the listener's own mood. The importance of understanding music (Statement 4) may appear to reflect a more cerebral response to music, however the statement links it to the capacity to derive enjoyment. Factor 3 represents a more explicitly *intellectual* frame to the way in which music is valued: emphasising its capacity to challenge the listener, downplaying the importance of beauty and affect, and valuing the music's cultural significance. Finally, Factor 4 only includes a single statement above the

±0.4 threshold and on this basis has been excluded from the subsequent modelling. By itself, Statement 6 is arguably less a particular mode of appreciation and, instead, is more reflective of the extent to which individuals recognise the importance of external referents and hierarchies in how music should be evaluated. While there is a degree of overlap between these factors and the 'frames' of appreciation identified in the discursive performance of taste in Chapter 4, particularly with respect to the intellectual and affective modes identified here, they reflect different aspects of relating to the objects of taste. Whereas the modes of appreciation reflect a dispositional stance which orients one towards art and culture, the discursive frames seek to examine how these dispositions are enacted and performed in practice.

The identified factors show a strong crossover with those identified by Daenekindt and Roose (2014) in their 'aesthetic dispositions' as ways of preferring, with their functional and postmodern aesthetics closely aligned with Factor 1 and Factor 4 respectively. Whereas their emphasis on distinct artistic aesthetics led them to distinguish separate modernist and critical dispositions, these have been subsumed in the present EFA into the general intellectual frame of Factor 3. Similarly, Factor 2 is largely present as a subset of Daenekindt and Roose's functional aesthetic, whereas musical appreciation warrants considering it as a separate mode of appreciation. A degree of overlap can also be observed with Jarness's (2015) more general modes of consumption. The practical mode matches the functional emphasis of Factor 1, the intellectual mode closely aligns with Factor 3, and the level of deference to external opinion captured in Factor 4 corresponds with the degree of trust which Jarness's educational mode places in perceived experts. While the affective and emotional aspects of Factor 2 could again be subsumed within a functional perspective, the EFA's capacity to identify this as a distinct mode of appreciation represents an important distinction made in the particular context of music. Music can be 'practical' in helping achieve something, but the capacity to value its specific emotional capacities represent a distinct mode of appreciation.

While these factors readily lend themselves to interpretation and follow normal distributions, they only exhibit moderate correlations with demographic characteristics of respondents. Fitting linear regression models against the factor

scores for each respondent (scaled to values between 0 and 1), shows that Factor 1 displays significant negative effects of increased age, social capital (the average CAMSIS-OZ social stratification score of the respondent's nominated acquaintances) and cultural capital (the CAMSIS-OZ score for the respondent's occupation). This points to functional uses of music being more common among younger and less culturally elite or socially connected participants.

Beyond demographics and notions of capital accumulation, the three cohorts of broad musical interest failed to show any clear patterns of correspondence with particular modes of consumption. The exception to this was among those with an interest in traditional classical music, who were moderately less likely to employ the intellectual frame of Factor 3 in their listening habits (linear regression $\beta = -0.14$; $SE = 0.03$; $p < 0.001$). Factor 3 was also positively associated with participants who identified as regularly listening to diverse musical styles and also those who engage in discussions about musical styles and trends.

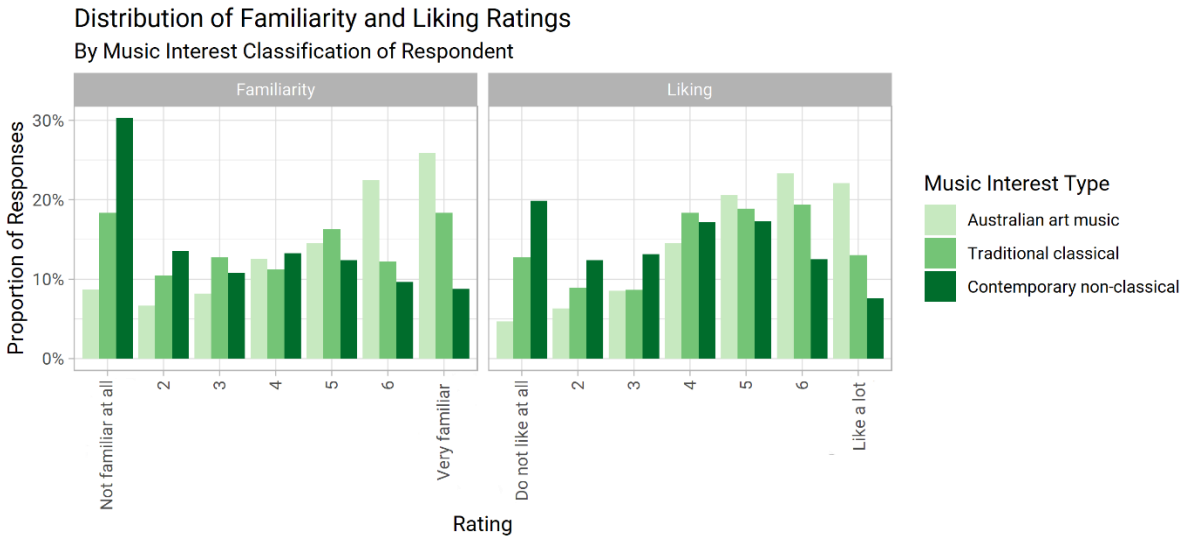
The EFA identifies latent factors which lend themselves to interpretation as distinct modes of appreciation drawn upon in the consumption of music. That the modes do not neatly align with different objects of taste, as represented by the three participant musical interest cohorts, confirms that they offer a unique insight into understanding the operation of taste. The same modes can be used to value and appreciate different music and, conversely, the same music can be valued in different ways. At the same time, the presence of only moderate levels of correlation between the factors and particular demographic variables only provides limited support for the notion that different modes of consumption might be the outcome of particular modes of socialisation, age notwithstanding.

5.4.3 Recommending unfamiliar music

Turning to an analysis of participants' music recommendations, Figure 5.2 shows the overall distribution of liking and familiarity ratings in response to the audio samples. Given the samples were drawn from a library of Australian art music recordings, it is unsurprising that the highest familiarity ratings come from those with a declared interest in this specific sub-genre; those with an interest in traditional classical music display less familiarity with the recommended music, and those who predominantly

listen to contemporary non-classical music have least familiarity. Across all musical interest classifications, the overall liking ratings are higher than what might have been expected given both the sub-genre of art music's traditional reputation for being difficult and impenetrable (Needham, 2012) and the relatively low scores achieved in previous experimental design recommender studies (Taylor & Dean, 2019). The higher liking ratings among the cohort of traditional classical participants compared to contemporary non-classical suggest that genre proximity is significant in orienting affective responses.

Figure 5.2 Liking and Familiarity Ratings



The subsequent analysis of recommendation data firstly considers the extent to which the postulated relationship between familiarity and affective response was observed, before then analysing the extent to which acoustic similarity corresponds to perceived familiarity. The analysis concludes by modelling how liking can be predicted for those with a pre-existing familiarity with the sub-genre and, separately, for those lacking prior familiarity with Australian art music. The modelling approach considers the potential inclusion of random effects on intercepts for both individual participants and the particular composer whose work is being recommended. In addition to potential random intercept effects, random slope effects for individuals were also considered to assess possible variation in individual responses to main effects such as familiarity and similarity. The models were fitted using the `lme4` package (Bates, Maechler, Bolker, & Walker, 2019) in R, with comparative model performance assessed using the Bayesian information criterion (BIC). Significance testing is

problematic in mixed effects models due to ambiguity in the calculation of degrees of freedom and the approach implemented here is to utilise Satterthwaite's (1946) approximations as provided in R's `lmerTest` package (Kuznetsova, Brockhoff, & Christensen, 2019). Calculation of R^2 values for mixed-effects models was performed using the approach of Nakagawa and Schielzeth (2013) as implemented by Makowski (2018). Following Norman (2010), Likert scale responses were treated as continuous variables, with all other continuous variables (with the exception of age) transformed to a common scale of 0 to 1 to aid interpretation.

5.4.3.1 Modelling perceived familiarity and affective responses

The initial modelling of participants' affective liking responses analysed the extent to which perceived familiarity can predict liking ratings. The notion of liking what you know is common to both psychological and sociological theories of affective preferences, and the data collected allows an analysis of how 'liking' (as captured on a 7-point Likert scale ranging from 1 (Do not like at all) to 7 (Like a lot)) can be predicted from 'familiarity' (as captured on a 7-point Likert scale ranging from 1 (Not familiar at all) to 7 (Very familiar)).

Each of the first three factor scores for modes of musical appreciation, as identified in Section 5.4.2 above, were considered as candidate independent variables. The classification of the participant's musical interest was also included as a categorical variable with a base contrast of having an interest in Australian art music, against options of either having an interest in traditional classical music, or predominantly following contemporary non-classical genres. Finally, stylistic aspects of the composer of the recommended sample were also considered by including two variables derived from multivariate acoustic analysis. The first variable places composers on a continuum, distinguishing between those who adopt modernist styles as opposed to jazz- and minimalist-influenced styles. The second variable contrasts composers who employ experimental approaches as opposed to those working in more traditional styles.

The optimal model, specified in Model 5.2 below, shows familiarity to be a significant effect, with each Likert-scale increase in familiarity improving the corresponding liking scale by just under 0.2 (Cohen's d = 0.1). While the manner in which the

research instrument asked respondents to rate each excerpt for both familiarity and liking introduces the potential for responses to be influenced by conflating the two concepts, the model's interaction effects show variation in familiarity's capacity to influence liking. Specifically, the degree to which familiarity moderates liking has a small degree of dependency on both the participant's emotional engagement with music (Factor 2), together with the experimentalism of the composer being recommended. This shows that those who rate highly on Factor 2 are less likely to enjoy music when they are unfamiliar with it. The association between familiarity and emotional responses to music has been demonstrated in experimental Likert-rating (Ladinig & Schellenberg, 2012) and fMRI (Pereira et al., 2011) studies, and these current results further distinguish that the significance of this effect is moderated by the modes of consumption which participants differentially employ. Similarly, a high degree of experimentalism by the composer serves to increase the effects of unfamiliarity on reducing affective liking ratings. It is one thing for music to be unfamiliar, but to be both experimental and unfamiliar is evidently regarded as worse – particularly for those whose preferences stem from an affective mode of appreciation.

Model 5.2 Predicting liking with perceived familiarity information

Fixed Effects	Coefficient	SE	T-statistic	P-value
Intercept	3.968	0.367	10.825	< .001***
Familiarity	0.195	0.063	3.077	< .01**
Musical Interest: Traditional Classical	-0.248	0.209	-1.187	> .1
Musical Interest: Non-classical Contemporary	-0.472	0.169	-2.794	< .01**
Composer Jazz/Minimal Influences	1.032	0.240	4.308	< .001***
Composer Experimentalism	-2.208	0.500	-4.418	< .001***
Affective Mode (Factor 2)	-2.017	0.507	-3.979	< .001***
Familiarity * Composer Experimentalism	0.366	0.096	3.817	< .001***
Familiarity * Factor 2	0.324	0.087	3.705	< .001***

Random Effects	Variance	SD
Participant	1.036	1.018
Composer	0.070	0.265

Conditional R^2 of 66.64%, in which the fixed effects (marginal R^2) explain 38.09% of the variance

Linear mixed-effects regression formula: Liking ~ Familiarity + Musical Interest + Jazz/Minimal + Experimentalism + Affective Mode + Familiarity:Experimentalism + Familiarity:Affective + (1|Participant) + (1|Composer)

Contrasts: Australian art music interest

The model identifies two further fixed effects as influencing liking scores. Unsurprisingly, those with an interest in Australian art music (the base category, not shown) were significantly more likely to give higher liking ratings compared to respondents whose primary interest was in non-classical contemporary music. The size of this effect, however, is somewhat surprising given the esoteric nature of the

music included in the survey. The effect accounts for a difference in the Likert-scale ratings between these categories of 0.472 (Cohen's d = 0.25), which suggests that the barriers to engaging audiences in exploring foreign styles may not be as substantial as might be assumed. Finally, the model also identifies that particular stylistic sub-genres of Australian art music are more likely to be positively received than others. Liking ratings are considerably higher when responding to the music of composers operating in jazz and minimalist idioms as opposed to complexity and modernism. Moreover, high degrees of experimentalism have an even more pronounced negative effect. These findings highlight the importance of considering which specific stylistic trends are most useful as gateways for users exploring a genre. Rather than drawing on the most 'central' composers in the field to make recommendations, it suggests that there are particular sub-genres which are more likely to have affective appeal.

5.4.3.2 Familiarity and Similarity

While the previous model helps understand the role of familiarity with individual musical samples in affective responses, the task of making real-world recommendations to users is without such fine-grained familiarity data. To that end, it is useful to consider the degree to which various notions of similarity can be incorporated into a model to predict a participant's familiarity with a particular musical sample. If a piece of music is algorithmically discerned as being similar in some way to an item which a user has already identified as liking, it can be hypothesised that the new item's familiarity for that user will vary in accordance with the underlying degree of similarity.

To examine this, for each audio sample rated by a participant, the acoustic distance between that sample's composer and each of the participant's five nominated favourite artists was calculated and represented on a dissimilarity scale (0 = identical; 1 = most dissimilar). The minimum of these distances was taken to represent acoustic similarity between the participant's existing musical interests and the audio sample, which in turn was modelled to assess its capacity to predict the user's familiarity score. The resulting model is specified in Model 5.3 below.

Model 5.3 Predicting familiarity from acoustic similarity

Fixed Effects	Coefficient	SE	T-statistic	P-value
Intercept	4.849	0.143	33.844	< .001***
Acoustic Similarity	0.661	0.586	1.127	> .1
Musical Interest: Traditional Classical	-0.587	0.324	-1.813	0.07
Musical Interest: Non-classical Contemporary	-1.309	0.259	-5.053	< .001***
Acoustic Similarity * Music Interest: Trad. Classical	-2.004	0.817	-2.452	< .05*
Acoustic Similarity * Music Interest: Non-classical	-2.129	0.805	-2.645	< .01**

Random Effects	Variance	SD
Participant	2.237	1.4958
Audio Sample	0.152	0.3899

Conditional R^2 of 64.31%, in which the fixed effects (marginal R^2) explain 12.80% of the variance

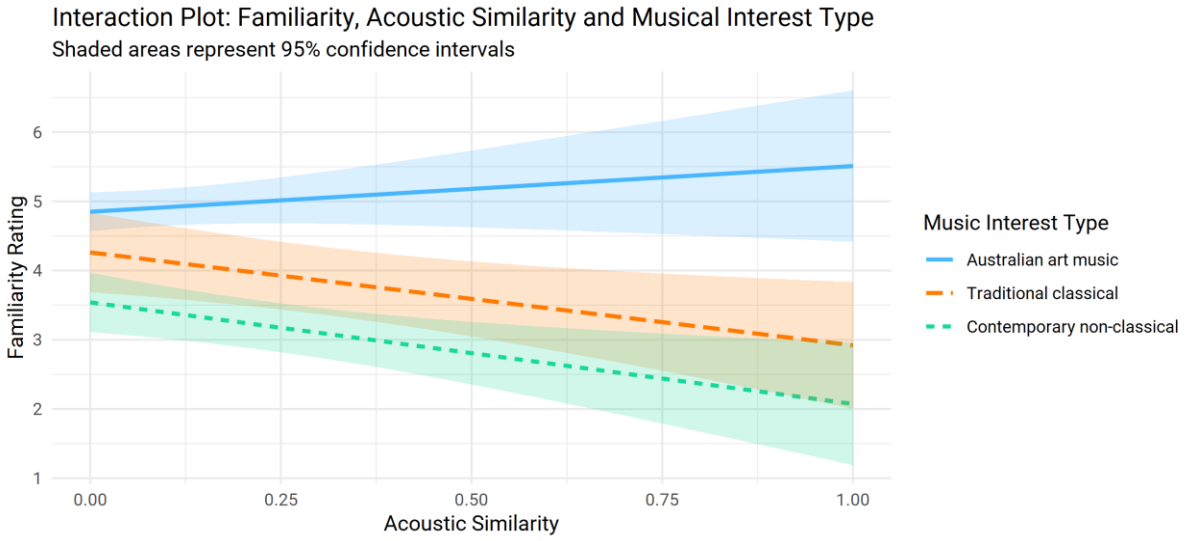
*Linear mixed-effects regression formula: Familiarity ~ Similarity * Musical Interest + (1|Participant) + (1|Composer)*

Contrasts: Australian art music interest

Overall, the model shows that the expected relationship between familiarity and acoustic similarity (ranging between 0 (identical) and 1 (most dissimilar)), only holds for recommendations made to respondents who are relatively unfamiliar with the recommended genre. As shown in Figure 5.3, this interaction demonstrates that for those who do not have a pre-existing interest in Australian art music, as the music they hear bears a stronger acoustic resemblance to the music of artists they already listen to (increasing right-to-left in the graph), their familiarity score similarly increases. This points to potentially different processes of discrimination which are applied as listeners encounter music from within a genre whose stylistic contours they

have familiarity with, as opposed to music which represents a much greater stylistic contrast to the genres they commonly listen to. For the former, the sorts of dissimilarity which are suggested by acoustic feature analysis are far less likely to correspond to the sorts of fine-grained discrimination and familiarity which regular followers of a genre are likely to engage in.

Figure 5.3 Interaction plot for Model 5.3



5.4.3.3 Recommending an unfamiliar genre without familiarity ratings

The task of making a recommendation to someone who has minimal previous interest in a particular style of music is considered here by the classification of users who nominated that their musical interests lay outside of ‘classical’ or ‘art music’ traditions. As with the previous models, a mixed effects linear regression was fitted to the data, in this case to predict the respondent’s 7-point Likert scale rating of affective liking. The optimal model is specified as Model 5.4 below.

Model 5.4 Predicting liking without familiarity for non-classical participants

Fixed Effects	Coefficient	SE	T-statistic	P-value
Intercept	4.165	0.626	6.654	< .001***
Composer Jazz/Minimal Influences	1.375	0.508	2.707	< .01**
Composer Experimentalism	-2.786	0.626	--4.452	< .001***
'Intellectual' Mode (Factor 3)	2.022	0.672	3.100	< .01**
Acoustic Similarity	0.568	1.291	0.440	> .1
Acoustic Similarity * Occupation Stratification	-6.350	2.121	-2.993	< .01**

Random Effects	Variance	SD
Participant	1.194	1.093
Composer	0.207	0.455

Conditional R^2 of 53.96%, in which the fixed effects (marginal R^2) explain 19.74% of the variance

Linear mixed-effects regression formula[50]: Liking ~ Jazz/Minimalism + Experimentalism + Intellectual Mode + Similarity + Similarity:Ocupation social stratification + (1|Participant) + (1|Composer)

The strong main effect of familiarity found in Model 5.2 is replaced by acoustic similarity, but the model only demonstrates a significant effect as an interaction with high values of cultural capital (as measured by the CAMSIS-OZ social stratification score of the respondent's occupation). The model suggests that the capacity for acoustic dissimilarity (i.e. hearing music whose acoustic qualities are unlike those already enjoyed) to negatively affect enjoyment is dependent on having an occupation associated with higher levels of social stratification. For those occupying jobs with lower levels of cultural capital, however, the impact of acoustic similarity is

[50] The formula syntax (1|*variable*) adds a random effect to the linear model by varying the intercept using *variable*.

insignificant. Specifically, when applying the Johnson-Neyman technique to identify the range of values for which an interaction relationship is significant (Johnson & Fay, 1950), it shows that this holds for scaled CAMSIS-OZ stratification scores above 0.43. These findings should be considered alongside the fact that the sample being considered is those who have no interest in either contemporary Australian or traditional classical music – both domains which have traditionally been associated with cultural elites (Bennett et al., 1999). For elites who do not have this prototypical interest in classical music, they are more likely to hold steadfast to their own musical tastes and more resistant to exploring beyond them. Instead of 'anything but heavy metal' (Bryson, 1996), it is a case of 'anything but classical' by which this group uses a *dislike* to form a symbolic boundary.

The other main effects found in Model 5.4 point, firstly, to the stylistic considerations of the music being recommended. For those unfamiliar with this esoteric sub-genre, it shows that liking ratings increase significantly both for music by composers working in jazz and minimalist idioms (as opposed to complexist modernist styles) and who are less experimental in their approach. This points to the importance of selecting particular 'easier' styles over others when introducing new listeners to a genre. Finally, the positive coefficient for the intellectual mode of musical consumption (Factor 3), reinforces the notion of art music's approachability to those who regard themselves as disposed to disinterested appreciation of music.

5.4.3.4 Recommending a familiar genre without familiarity ratings

For those already familiar with Australian art music, the task of recommending unfamiliar music was isolated by considering only those responses where the participant rated the music as having a familiarity score of three or less. While models involving acoustic similarity to predict liking were able to produce significant effects, the model with the strongest performance in terms of BIC and R^2 involved only considering main effects relating to modes of appreciation and the musical style of the composer. As a result, Model 5.5, specified below, provides no interaction effects which would support dynamically responding to users with recommendations based on their prior musical interests combining with either demographics or modes of appreciation.

Model 5.5 Predicting liking without familiarity for Australian art-music interested participants

Fixed Effects	Coefficient	SE	T-statistic	P-value
Intercept	6.204	0.602	10.304	< .001***
'Affective/Emotional' Mode (Factor 2)	-2.389	0.716	-3.337	< .01**
'Intellectual' Mode (Factor 3)	1.775	0.582	3.050	< .01**
Composer Experimentalism	-4.953	0.702	-7.057	< .001***

Random Effects	Variance	SD
Participant (Intercept)	0.977	0.989

Conditional R^2 of 51.64%, in which the fixed effects (marginal R^2) explain 20.9% of the variance

Linear mixed-effects regression formula: Liking ~ Affective Mode + Intellectual Mode + Experimentalism + (1|Participant)

Instead, the model identifies a main negative coefficient for affective and emotional modes of consumption (Factor 2). As was the case when modelling the responses of participants who were unfamiliar with Australian art music, there was an increase in liking for those who engage in intellectual modes of music consumption and a negative impact when responding to music by composers engaging in experimentalism. The size of this last coefficient in the current model ($\beta = -4.95$) compared to the previous model ($\beta = -2.56$) is surprising, given one might assume that increased familiarity with a genre would increase one's openness to experimentalism and avant-garde practices. In contrast, it points to the challenges for experimental approaches to engage with audiences for whom the music is unfamiliar. It suggests that once audiences have gained familiarity with a sub-genre, their openness to forms of experimentalism with which they are unfamiliar is extremely limited. Similarly, for audiences who value emotional and affective engagement with music, being unfamiliar with a piece of music may well form a barrier to being able to form strong positive affective responses. A paradox emerges in which a barrier to appreciating the unfamiliar may arise from both deep engagement with proximate styles and from a love of music which happens to be based in emotional appreciation.

5.5 Discussion

These results show scope for understanding the operation of musical preferences that incorporates and extends measures of familiarity. Rather than focussing on familiarity *or* modes of appreciation, the exploratory analysis helps demonstrate a nuanced approach that accommodates both the interactions between these two concepts, and the particular stylistic qualities of the music and the user's familiarity with the codes and schemas of perception which operate in the field of music being recommended. In particular, the substantial effects attributable to stylistic qualities, even when familiarity with particular styles is accounted for, draw attention to the importance of Hennion's 'return to the work' in the consideration of preferences. Rather than considering genres, or even sub-genres, as homogenous and largely interchangeable forms, these fields instead contain continuums of musical characteristics which provide varying levels of affordance for affective engagement. It is possible that these stylistic qualities have some form of symbolic association for the listeners which partly shapes their responses, but this ambiguity points to the need for more detailed research into the processes by which attachments are formed to some but not all unfamiliar music. This echoes earlier qualitative findings, such as the ethnographic work of DeNora (2000), which explores how particular modes are adopted in relation to particular types of musical material. Such work does not seek to disregard the 'social and behavioural entailments' (DeNora, 2000, p. 141) of particular forms of music, but suggests a more holistic way in which they can be considered.

In considering the propensity of participants to engage in omnivorous behaviours, both in the frequency of engaging in music discovery and through an affective openness to unfamiliar music, the study observed only weak associations with socio-demographic variables. The concept of omnivorousness as a 'scheme of perception emerging from new aesthetic paradigms' (Hanquinet, 2018) and which is socially formed was not found in the confines of the current survey's sample of music enthusiasts. While age was significant in how participants reported their use of platforms for discovering music, it failed to be relevant in producing stronger affective liking ratings in response to unfamiliar music recommendations. Locating truly omnivorous behaviours (as opposed to knowledge of or identification with diverse styles) as part of a mode stemming from socially structured groupings would,

therefore, appear to be unsupported when using the measure of affective ratings. This aligns with findings from earlier omnivore research methods which rely on modelling participant responses to researcher nominated lists of named works or genres. In the multiple correspondence analysis (MCA) conducted by Savage and Gayo (2011), for instance, they concluded that none of their clusters could be considered as truly omnivorous and that all were characterised by discriminating musical tastes. Among the 'experts' cluster identified by Savage and Gayo, they note the divided nature of taste between a predilection for 'new and emerging musical forms' and other less innovative styles. A disjuncture appears, however, between identifying with a style and actual tolerance for experimentalism in response to specific works – at least in the extreme forms supplied by contemporary art music. Even participants belonging to an 'expert' cluster held strong negative affective responses to increasing levels of experimental musical practice.

Whereas most omnivore research examines preferences across a diversity of musical styles and genres, the current study considers how cohorts with differing familiarity with a single field, contemporary Australian art music, engage with the unfamiliar. While familiarity with the particular codes associated with that field did show an effect on affective ratings, this effect was relatively small. The study is limited in considering only short-term affective responses to samples of works; yet participants with no interest in contemporary art music were not simply confounded by the music they heard. This firstly raises questions as to the assumptions of both Meyer and Bourdieu regarding the necessary link between mastery of codes and meaning. It also highlights that research which emphasises participant *knowledge* of different genres overlooks the capacity of participants to engage with and derive pleasure from music with which whose stylistic codes they are not yet acquainted. While the processes of developing knowledge of diverse styles is of interest, particularly with regard to the social capital it may demand, it should not be confounded with the capacity for people to employ a mode of cultural openness. It also raises questions as to the historiography of the experience of music. In contrast to social, technological and cultural constraints which previously limited our experience of the musically unfamiliar, our contemporary music environments have reshaped our exposure to novel and foreign musical sounds. Beyond the unparalleled access of digital streaming

services, our experience of music through diverse media – such as advertising, film, television and gaming – suggest new topics of investigation to consider how these historical shifts have impacted our capacity to relate to the unfamiliar.

The specific modes of engaging with music identified by way of exploratory factor analysis provide a novel way for considering the different ways by which people engage with, value and *utilise* music in their everyday lives. Whereas Daenekindt and Roose (2014) sought to align their analysis of art museum audiences with particular aesthetic dispositions, the consumption of music spans a broader range of cultural forms and most often does so without the institutional framing of the museum or gallery. The interpretation of latent factors, therefore, points to the more general ways in which the functional, emotional and intellectual dispositions guide interactions with music, along with the degree to which external referents are acknowledged in valuing music. As with the findings of Daenekindt and Roose (2014), the current study shows a diversity of modes of appreciation among the different musical interest classifications and only moderate correlation between the modes and socio-demographic variables. While different modes can give rise to the same musical interests, there is little evidence to locate the adoption of these modes in particular modes of socialisation and processes of distinction. The presence of an 'affective/emotional' mode for appreciation and consuming music (Factor 2), did, however, show a strong negative correlation with liking unfamiliar music, with the inverse true for intellectual modes of appreciation (Factor 3). It is likely that this reflects, at least in part, a peculiarity of 'art music' and its traditionally disinterested mode of appreciation. It does, however, point to the intellectual curiosity found in Ollivier's (2008) humanist mode of cultural openness. Whereas all audiences may have access to emotional responses to music, particular modes of taste may be more likely to be employed by such omnivores. These in turn demand forms of capital which do indeed reconfigure rather than overcome the idea of hierarchies in cultural preferences.

Moving to the realm of music recommendations, the study demonstrates the limited utility of acoustic distance in forming a proxy for familiarity for this specific field of music. While users largely unfamiliar with Australian art music showed a significant

relationship between the familiarity ratings and the acoustic similarity of the musical sample to their preferred artists, no such link was evident for those already engaged in the Australian art music field. In predicting affective responses, it is interesting to note that similarity only played a role for those unfamiliar with art music and whose occupations were among the social elite. Rather than displaying omnivorous openness to music dissimilar to their existing tastes, these individuals were more entrenched in their opposition to unfamiliar sounds – reinforcing the notion that dislikes form an important role in social distinction (Bryson, 1996) and disputing any straightforward link between cultural openness and the social elite. Conversely, the findings point to most people – those unfamiliar with Australian art music and non-social elites – as being relatively open to new sounds. This suggests the potential for algorithmic recommendation and curation designs which promote music which is at least moderately unfamiliar.

Overall, the results emphasise the importance of going beyond notions of similarity and familiarity in theorising patterns of consumption, particularly for those with a vested interest in not only understanding but encouraging engagement with the unfamiliar. The ways in which individuals develop particular modes of appreciation, and the ways in which they then function as capacities able to derive affective appreciation from different styles of music, warrant further investigation. Extending this program of research to explore more diverse genres and in less experimental environments of data collection will aid in building a stronger base of empirical data on which these issues can be understood.

6 Conclusion: Towards multidimensional spaces of cultural practice

The central analytical concept of distance, which underpins the various modes and scales of enquiry pursued in this thesis, provides new insights into how our relationship to culture is shaped by overlapping and intersecting formations of similarity and familiarity. Instead of demarcating the differential dimensions and structuring principles of broad cultural fields, the use of a case study which examines a discrete artistic practice – Australian art music – has permitted greater nuance in considering how distance structures our capacity to know and engage with culture. While distance has been a long-standing concern for Bourdieusian cultural sociology, its analytical focus has largely been at a macro level in its conceptualisations of social distance and 'distance from necessity' (Bourdieu, 1984, p. 53). The present study has represented a departure from the kinds of broad contrasts between mass vs. restricted production (Bourdieu, 1983) or economic rationality vs. artistic innovation (Gilmore, 1993), by instead emphasising how distance shapes our relationship to culture at a local level. This shift in scale is similarly supported by the thesis' methodological approach. Whereas Bourdieu's pioneering use of multiple correspondence analysis drew attention to large-scale social and cultural distinctions, the methodological techniques collectively adopted have sought to translate these concerns to a more contained space of cultural practice.

6.1 Findings

This thesis has considered how the related concepts of similarity/distance and familiarity/unfamiliarity can be employed to extend a sociological understanding of cultural practices. The case study for this investigation was the field of contemporary Australian art music. As a musical style in which notions of 'distance' are particularly salient – in terms of the emphasis placed on artistic novelty and experimentation, which also introduces a degree of unfamiliarity for audiences to negotiate – it provided a fertile context in which to conduct the research. By approaching its object of study through the perspectives of multiple actors (producers, intermediaries and audiences), multiple practices (production, curation and consumption), multiple sources (big data, surveys and interviews) and multiple techniques, the thesis sought

to variously foreground the often largely axiomatic notions of similarity and familiarity. In doing so, it has argued that the actor constellations which distances produce are intimately linked to our capacity to engage with fields as discrete and knowable domains of cultural practice. As with de Saussure's (1959, pp. 88-89) analogy of structuralism to a game of chess – whereby its definition emerges from the inter-relationships among its constituent pieces, rather than its physical attributes – the existence of art music as a cultural object becomes defined by sets of proximal relations.

In Chapter 2, the analysis firstly established the different organising principles which underpin how different sets of actors understand distance within the space of cultural production. Instead of a *singular* Bourdieusian field, in which the position of actors is posited in terms of objective relations, the chapter demonstrated the capacity to contrast a fracturing of the field into a series of loosely cohering 'perspectival' planes, which variously intersect and overlap. From the perspective of the field's cultural producers, as modelled in the acoustic features of recordings, the distance between actors is understood in terms of readily identifiable stylistic dimensions. Modernism vs jazz/minimalism, traditional vs experimental, and serialism vs spiritualism/nature influences, form the three primary dimensions in which the distance between individual artists is represented using multi-dimensional scaling. The interpretation of these dimensions points to ways in which notions of distance can occupy a continuum, such as poles of traditional of experimental approaches, but also a capacity to present qualitative differences which are not directly oppositional. In this respect distance is not simply a presence or absence, but takes the form of strong but not necessarily entirely opposing qualities that are nevertheless able to make distinctions among the space of cultural production. The analysis also points to how producer-oriented understandings of distance relate to the accumulation of field-specific economic and symbolic capital. Bourdieu considers these concepts as central principles informing the structure of cultural fields and the analysis shows that minimising artistic distance, by eschewing stylistic extremes, is the most financially rewarding strategy. Artistic prestige follows a similar distribution, but is more likely to reward experimentalism as the most likely stylistic path to having formal legitimacy bestowed on a composer. Even in art music, as a field of restricted

production which supposedly rewards experimentation, economic success goes to those who are least experimental, while symbolic success is associated with moderate levels of experimentation. The findings from Chapter 3 further suggested that symbolic prestige encompasses more diverse sources of consecrating recognition – across a multidimensionality of distances – when compared with the singular dimension of economic success.

While the perspective of producers in what Bourdieu would consider as a 'field of restricted production' occupies a privileged position, the analysis also provided contrasts with how the space of producers is constituted from the perspective of curators who mediate Australian art music to audiences, together with the audiences themselves through their interactions on social media platforms. These findings firstly emphasise the minimising of distances which are observed in curatorial mappings of the field. Highly prominent composers are utilised to cohere otherwise distinct communities of artistic practice, which also suggests that appeals to familiarity are important considerations among those presenting this genre of music to audiences. The analysis also shows that particular curatorial networks – particularly those of performers – exhibit greater overlap with composer-oriented mappings of the field. Whereas Bourdieu posited a homology between social position and field position, this finding points to a related notion that close proximity between groups of actors in social space – such as the close collaboration which is often observed between composers and the performers – corresponds to similarity in how the field is perceived by those groups. The final perspective examined, that of social media users on Twitter and SoundCloud, presented a substantially different configuration of the space of producers and the distances between them. While the younger demographic of these platforms is reflected in a corresponding prominence of emerging and mid-career composers, it also draws composers into far more variegated juxtapositions. Instead of distance being defined in stylistic terms, social network affiliations bring a far more heterogeneous set of composers into proximity.

In Chapter 3, the model of acoustic distance established in Chapter 2 was then used to examine how the space of producers is variously assembled and presented to users across radio, concerts and digital playlists. As the traditional mainstay of radio is

increasingly replaced by digital streaming, the findings identify significant consequences for the representation of art music – particularly contemporary Australian composition – which are associated with this trend. While the ABC Classic FM network examined exhibits a strong bias towards Romantic era composers, it nevertheless supports a level of heterogeneity in its programming, which algorithmically curated playlists fail to match. Rather than simply a case of curatorial processes compressing the distances found in producer perspectives of the field – as observed in Chapter 2 – the content analysis demonstrated the partial and incomplete representations of art music which emerged from the curatorial choices of intermediaries. This supports the argument of Negus (2002), whereby cultural intermediaries are less concerned with access and inclusion and instead serve to maintain hierarchies and social divisions. While mixtapes of 'party music' or 'easy listening' compilations have long existed, the 'curation by affect' which emerges in the embrace of functional and mood-based digital playlists represents a new scale which shifts consumption away from critical and aesthetic sensibilities. The implications for local culture industries are also significant, as the findings highlight the level of support afforded by the domestic platforms of radio and concerts which are effectively absent from their global media counterparts. Audiences wanting to hear the niche areas of contemporary Australian art music are much more likely to be able to do so through concerts and, to a lesser extent, radio, and this lends support to calls for digital streaming services to introduce local content quotas. Despite offering unprecedented access to musical expression, new digital services provide what Hesmondhalgh (2013) refers to as a 'constrained agency' which limits our freedom to act. In this context, the digital offers a new kind of 'hyper-radio' which amplifies the concentration of the familiar and leaves live concerts as an important domain in which novelty is able to be brokered.

The consequences for audience experiences of unfamiliar art music are also shown to be disrupted by how music is assembled in digital playlists. Instead of the 'art of programming', whereby curators take an imagined audience on a journey which balances familiarity and unfamiliarity by carefully juxtaposing pieces of music, the analysis showed no such level of curation offered on Spotify's playlists. Instead, this role was effectively handed over to the listeners by providing them with a list of items

which can be skipped and rearranged to their liking. Finally, while concert events offer the context in which audiences can experience the most diverse musical sounds, the analysis of their programs was also able to demonstrate the role played by *individual* curators in shaping the representation of art music presented to audiences. Given the gender inequity which pervades Australian art music practice, the findings trace the way particular segments of concert performers – as curators – contribute to this inequity. In particular, it showed the importance of female performers and medium-sized ensembles in ensuring the representation of particular marginal voices. They are at the vanguard of presenting music by female composers and pushing stylistic boundaries, which constitute related but different senses of the unfamiliar. In reframing distances, these curators have a capacity to shift how the field is understood, even if that is limited to assembling a version which is more balanced and representative of the society in which it is consumed.

By turning to the more phenomenological level at which distance is experienced by audiences of contemporary art music, Chapter 4 demonstrated the limited role played by the anticipation of common understandings of pleasure by concert goers. The decision to attend concerts was instead framed in terms of duty and loyalty to a scene they were invested in, together with the social and professional opportunities afforded by attendance. Where notions of 'pleasure' did most clearly emerge, was in the fulfilment of a mode of cultural openness. In line with particular interpretations of the 'cultural omnivore', it was contemporary art music's valorisation of distance which was attractive to particular participants who sought to expose themselves to the unfamiliar in calculated ways in order to provoke a response. Instead of distances serving to separate and distinguish, it becomes a mechanism which is essential in forming an attachment. Turning to how audiences responded to the presentation of particular works, the analysis identified three frames of appreciation: the intellectual, affective and presentational dimensions of the music. While avoidance of evaluation was itself one important strategy, often linked to supporting modes of cultural openness, the findings identified the fluid and contingent strategies which were employed to enable audiences to form attachments to the objects of their musical taste. While intellectual frames of evaluation were important for audiences to affirm their own position within the field, a recourse to affective frames – and their basis in

readily accessible emotions and perception – was shown to be a common strategy to engage with music which was otherwise ambiguous and unfamiliar.

Finally, the findings in Chapter 5 showed how preferences for unfamiliar Australian art music can be understood in terms of the intersection between familiarity, preferred modes of appreciation, and the acoustic nature of the music itself. Instead of emphasising the mastery of musical codes as a prerequisite for deriving pleasure from music, the analysis supported theorisations of taste which go beyond straightforward notions of familiarity. This continues the theme observed in Chapter 4, whereby distance – and *lack* of familiarity – actually became central to the expression of musical taste. The observed capacity to enjoy music with which one is not yet well acquainted points to a 'behavioural' form of omnivorousness which goes beyond simply possessing a 'knowledge' of diverse musical styles. Attempts to locate this approach to listening in different social formations were not, however, supported by the findings. Similarly, the identification of three broad preferred modes of valuing and appreciating music – the intellectual, affective and functional – also failed to show any strong correlation with sociodemographic variables. By modelling the relationship between acoustic similarity and perceived familiarity, the chapter also highlighted the limits to how these related notions of distance overlap. For those less familiar with Australian art music, a significant correspondence was observed between similarity and familiarity; the acoustic similarity between their preferred artists and the music they evaluated in the survey resembled their perceived familiarity with the same music. For those already interested in the scene, however, no such relationship was observed. The nuances with which familiarity is perceived by these users could not be approximated through the use of acoustic models. This was despite the survey's context of a digital listening environment where respondents were unable to draw upon any of the non-musical cues (e.g. names of composers, performers, program notes) which those familiar with a field might typically use in making evaluations. While the chapter's findings emphasise the importance of going beyond familiarity in understanding preferences, this nevertheless highlights the complexities of developing suitable proxies for familiarity in a field which is itself preoccupied with the unfamiliar.

6.2 Contribution

In addition to its empirical findings, the thesis has also sought to extend the academic field of cultural sociology in new directions through its combination of Bourdieusian approaches to the study of culture with the opportunities afforded by big data. The key contributions discussed in this section firstly relate to the application of multidimensional approaches which analyse how fields can be understood through contrasting the perspective of multiple sets of actors. In applying novel network analysis techniques to the study of fields, it has also developed new approaches to conceiving of distances between those actors which are not simply processes of *distancing* implicit in Bourdieu's acts of distinction. The concern with unfamiliarity explored in the thesis also contributes to understandings of the 'cultural omnivore' and how an omnivorous sensibility of cultural openness can be understood in terms of techniques and modes of appreciation. By developing and drawing upon acoustic models of the music itself, the research also contributes to considering how the analysis of culture and its social context can engage with the specificity of the work. Finally, the thesis' use of contemporary statistical techniques also emphasises the new opportunities which are available for conducting research in cultural sociology.

In the context of theorisations of fields of cultural production, this has involved a shift from mapping the relative position of actors onto a single set of dimensions, to instead emphasise the contingency of the mapping process itself. As expressions of the latent organising principles which are at the heart of what is being produced and reproduced by these different positions, the contrasting articulations of how distances between actors are understood provides fertile ground in which to investigate sites of cultural production. In the domain of contemporary Australian art music practice investigated in this thesis, contrasting how producers, intermediaries and audiences each represent the field helps shape a scholarly understanding of field formation. It provides a contrasting empirical basis from which to consider Bourdieu's interest in the 'systems of *classification* through which actors make meaningful the world which makes them' (Wacquant, 1992, p. 7). These distinctive classifications not only arise in the relational positioning of actors engaged in a 'field of struggle' (Bourdieu, 1993, p. 30), but can also be understood in terms of how different layers of classificatory schemes – and the distances which they give rise to – intersect with each other as

different groups of actors engage with, participate in, and collectively constitute fields of cultural practice.

Among the various empirical methods employed in the analysis of cultural production, the thesis' application of social network analysis techniques also provides a substantial contribution. While forms of network analysis have previously been employed to investigate field dynamics (e.g. de Nooy, 2002) and the collective nature of creativity (e.g. McAndrew & Everett, 2015), the analyses presented in Chapter 2 not only provide new empirical baselines for future investigations, but have also sought to methodologically extend the forms of analysis available. As graph modelling techniques mature, the thesis has demonstrated the capacity to adopt these in examining the salient factors which shape networks of actors brought into association by third-party curators. It has also formalised novel approaches for distilling the concept of *distance* from social networks through the use of 'shared neighbourhood' analysis. Networks on modern social media platforms are large and sparse, yet also exhibit small diameters, which prevents the nuanced differentiation of actors using standard techniques for deriving distances from unweighted networks. Shared neighbourhoods, by contrast, offer a means for generating weighted networks which reflect the relative distances which are embedded in the collective relationships between a platform's users.

From the perspective of investigations into cultural consumption, the thesis builds upon work into the nature of omnivorous behaviours. Whereas studies of the cultural omnivore have, understandably, focussed on consumption habits across multiple fields, or across the hierarchies within a broadly defined field such as music, the current study's focus on patterns within a narrow genre, offers new insights into how this mode of consumption can be understood. Rather than forms of omnivorism which emphasise *knowledge* of diverse cultural forms – which Bennett et al. (1999, p. 199) argue underlies the approach of Peterson & Kern's (1996) seminal work, together with the original survey questions used by Bourdieu himself – the analysis presented here emphasises an ability to enjoy and derive 'pleasure' from what is (pointedly) unfamiliar. Rather than the mastery of genre-specific codes, it becomes the mastery of techniques through which the unfamiliar can be 'understood'. This

experiential dimension of omnivorousness demonstrates parallels with Ollivier's (2008) 'humanist mode of cultural openness'. Whereas Ollivier and Schwarz (2013) seek to locate this in a reconfigured form of social distinction, there was no observed socio-demographic structure to the observed patterns of positive engagement with unfamiliar Australian art music recommendations. The emphasis on the modes and techniques through which consumers appropriate the objects of their attachment also serves to complicate theorisations which postulate – explicitly or implicitly – a more straightforward relationship between familiarity and taste. Rather than tastes proceeding from a social or psychological knowledge of particular musical codes, the thesis demonstrates the need to go beyond such formulations to adequately explain patterns of musical preference. Concepts of 'preference' and 'taste' – as inherent attributes or capacities – instead give way to the processes by which music is appropriated and enjoyed. This aligns with the notion of 'attachment' theorised by Gomart and Hennion (1999) as the *generative* techniques and dispositions which are reflexively drawn upon by music amateurs[51] to submit themselves to their passions.

In analysing distance among both the production and consumption of culture, the thesis has also provided new ways of incorporating the specificity of works into its analysis. In the context of critiques which lament a lack of concern for the actual works of cultural practices (e.g. Hennion, 2012), the thesis has sought to draw upon the unprecedented availability of music recordings in the current era of big data. Underlying the mapping of producers in Chapter 2, the distinctiveness of music curations in Chapter 3 and the modelling of similarity and preferences in Chapter 5, have been models based on the acoustic features of the music itself. While the contemporary accessibility of digital repositories presents a risk of returning to the kinds of purely 'internal' modes of explaining fields which Bourdieu (1993) himself sought to overcome, the thesis has instead sought to provide a more nuanced way of incorporating a 'return to the work'. Not only does Chapter 4 allow a consideration of how this interaction unfolds in the experience of the music, but the quantitative

[51] This use of the term 'amateur' is from the French and does not refer to a 'non-professional', but is instead closer to 'fan' or 'connoisseur' and refers to any person sufficiently systematically engaged in activities which develop their sensitivities to or abilities in a particular domain (Hennion, 2007, p. 112).

approaches also place any significance attached to the work within broader contexts of its statistical interaction with other factors (e.g. modes of appreciation; capital accumulation) and its place alongside other perspectives which structure the field (e.g. cultural intermediaries; audiences).

More generally, the thesis has demonstrated the opportunities available to cultural sociology by engaging with diverse contemporary quantitative techniques which go beyond the simple table or the intricate multiple correspondence analysis. Indeed, it has suggested that we need to deploy multiple techniques to explore the diverse ways in which distance and familiarity structure the production, curation and consumption of an art form. Just as the emerging methods of correspondence analysis enabled Bourdieu to open up new avenues of investigation into cultural tastes, so too the contemporary era of big data and statistical innovation offers a new basis for the production of knowledge. Approaches such as multivariate acoustic analysis, inferential network modelling, and randomised permutation analysis, all present new epistemological opportunities for the production of knowledge. Rather than an intentional eclecticism, they reflect responses to the current era of big data which affords new modes of analysis and propels the field into new areas of investigation.

6.3 Implications

The kaleidoscopic understanding of distance presented in this thesis poses broader questions for how we understand both fields of cultural practice and the broader social spaces in which they are located. With respect to the former, the continuous and multifaceted nature of distance can be interpreted as resisting the definition of neat and coherent fields. While a kind of fractal cascading of fields is found in Bourdieu's own theorisation of fields of cultural production – the literary field has its own internal hierarchies, while also existing in a hierarchy of artistic fields – the continuum of distance suggests an ability to disrupt any *bounded* space of relational position taking. Just as the contemporary environment of music production and consumption increasingly undermines the notion of clearly defined genre labels (Beer, 2012; Rimmer, 2012), the continuum of distance similarly disregards a priori category boundaries. In this context, a concern for Bourdieu's notion of *modus operandi* – the transposable guiding principles for cultural consumption generally –

becomes particularly relevant for its capacity to go beyond the confines of a specifically demarcated field. While the 'performance' and reproduction of distinct and bounded fields can continue to be observed in institutional interests which seek the stability and legitimacy of discrete practices, they do so in a manner which is increasingly at odds with the fluid ways in which a multiplicity of distances – and the multiple sets of organising principles they entail – are brought to bear to guide action in relation to culture. This reconfigured understanding of social space echoes the plurality of dispositions which is of interest to Lahire (2003, 2008) and the need to understand social behaviour as the result of selectively drawing from a multitude of dispositions accrued through the multiplicity of our social interactions. The social distances by which individuals can be said to be proximate or apart are themselves multiple, which complicates the attempt to locate cultural practices in any singular social space. As argued earlier in this thesis, for example on page 84, this multiplicity means that single measures of distance not only resist dissolving neatly into convenient discrete social categories, their span also takes on qualitative gradation that is not strictly oppositional. Jazz and minimalism are not coherently opposed to modernism for example, but do appear 'distant' under one frame of analysis. This underscores as well as complicates one key Bourdieusian precept: distance itself is a practice, an act that distributes social objects across a space, and in so doing helps to define a field. It makes rather than discovers distinctions. In addition to the multi-dimensionality which this thesis applied to its analysis of particular cultural dimensions of social practices, it points to the need to apply this approach more comprehensively in the analysis of social space.

The thesis also points to the need to adopt new approaches to understanding 'culture' as it morphs in contemporary digital environments. For music in particular, the limited accessibility to culture enjoyed by Bourdieu's survey respondents in 1960s France is barely recognisable today. Individuals now have on-demand access to libraries of over 30 million songs – instantly available anywhere on mobile devices – with their listening habits tightly interwoven with their online social networks. This listening behaviour, in turn, integrates with computational and human content analysis to inform machine learning algorithms. The resulting recommendation and discovery services serve to promote particular understandings of culture. In this new

environment, a series of tensions can be observed. People spend more time listening to music, but do so under new forms of commodification. Just as Adorno (1945) critiqued the commodification which arose from radio, in which even 'serious' music became 'entertainment', the era of digital streaming involves a sudden shift in the control able to be exerted by media platforms such as Spotify and YouTube. While today's listeners have access to new levels of agency in shaping their own musical environment relative to Adorno's, they do so through the use of digital services which frequently play a homogenising influence in the algorithmic presentation of content. The lack of transparency among these new 'infomediaries', as Morris (2015) refers to them, also presents new challenges for research. While the surface level of content featured in Spotify playlists, as analysed in Chapter 3, is at least available for analysis, the algorithmic ways in which culture is increasingly mediated to audiences are less amenable to scrutiny. The investigation of culture in this digital environment, therefore, requires new methodologies which can explore and theorise the newly mediated relationships which are now imbricated in our tastes and preferences.

6.4 Limitations and future work

While the backdrop of big data has afforded a range of new opportunities and directions pursued in this thesis, it similarly introduces epistemological conditions which constrained the scope of analysis. As the production and consumption of culture increasingly takes place in the context of privately owned digital ecosystems, our capacity to interrogate the digital traces of society's engagement with culture is increasingly at the fluctuating discretion of commercial interests. The resulting omission from this thesis of how contemporary Australian art music is represented on Facebook – as the most ubiquitous and demographically balanced platform – is a conspicuous example of this limitation. Similarly, the instability encountered with application programming interfaces (APIs) resulted in an inability to go beyond stated and experimental observations of taste to also collect traces of actual behaviours – which music is listened to and when – from everyday music consumption activity. While information asymmetries between researcher and platforms have always been present in cultural research, this points to ways in which they have evolved in the digital environment. As the collection of data increasingly becomes central to the

business models of service provision, commercial interests become a barrier which prevents its availability to researchers. Pursuing opportunities to overcome this constraint would enable an examination of the relationship between 'cultural openness' as a mode of consumption and process of self-identification, and how this translates to the kinds of 'distances' traversed in day-to-day listening processes. The different levels of conspicuousness with which one *performs* omnivorousness also invites scrutiny of the degree to which they may be differently associated with achieving forms of social distinction.

Throughout the thesis, the synchronic mode of analysis employed also represents a limitation to be addressed in future research. If fields are to be understood as the relational positioning of actors, it follows that a longitudinal lens of analysis will provide a more robust understanding of the structuring principles which contract and expand the spatial distance between actors. Also, it will permit an examination of how the positions of actors shift in terms of their overall centrality within the field. Resolving these challenges not only requires a sufficient level of data collection which is able to represent successive points in time, as was previously observed in the longitudinal studies of Ensemble intercontemporain, but also the adoption of analytical techniques suited to time-series data. The ongoing development of statistical approaches which support modelling the evolution of networks, such as `tergm` (Krivitsky & Goodreau, 2019), offer one such avenue to further establish the mechanisms which shape spatial relationships among cultural producers. The capacity to give greater attention to the temporal dynamics of cultural fields is not just limited to quantitative modes of analysis. The existing qualitative interviews already offers a dataset from which to pay further attention to the trajectories of taste formation and development. These trajectories are of interest both in terms of the development of interests in the specific *opus operatum* of Australian art music – particularly given the ambiguous position it occupies at the intersection of axes of high/low and new/old culture – and the *modus operandi* of principles by which the unfamiliar is appropriated as an object of appreciation. Rather than taste having arrived fully formed, it permits a consideration of the pedagogical and formative processes through which this relationship to 'distant' cultural forms emerges.

At a statistical level, the thesis sits at the cutting edge of many techniques, and the ongoing refinement and development of these approaches provides opportunities to revisit avenues of analysis which were not available during the original research. In network analysis, for example, the capacity to model and assess goodness of fit measures for weighted networks provides the capacity to develop models capable of reflecting the varied intensity of network relationships. Similarly, techniques for carrying out Bayesian inference in exponential random graph models (Caimo & Friel, 2014) have continued to evolve and provide the opportunity to refine models which incorporate posterior distributions of parameters. Beyond the refinement of models, new techniques also offer substantive new modes of analysis. The capacity to represent multiple perspectives of the field as multiple sets of edges in a 'multigraph', offers the opportunity to interrogate how these perspectives intersect in the trajectories of cultural fields. Furthermore, the application of techniques for investigating asymmetrical distances, whereby the distance perceived by actor A to actor B is not necessarily reciprocated, also offers new avenues through which to consider the relative proximity and centrality of actors.

The thesis findings also point to the obvious opportunities to go beyond the specific case study of contemporary Australian art music, to examine how notions of distance function in both other musical practices and broader cultural fields. Such future work would not only provide for a comparative understanding of how distance functions in different contexts, but also permits investigating the transposability of modes of aesthetic appreciation in general and cultural openness in particular. By also adopting modes of analysis which acknowledge the multiplicity of our social embeddedness, and the ability to mobilise different dispositions in our engagement with culture, this would support a stronger theorisation of the social dimensions of distance by allowing a closer dialogue with Bourdieu's conception of the homology between social position and cultural practices.

6.5 Coda

The various forms of distance traced in this thesis support both alienation and appeal. Returning to my own initial engagement with contemporary art music, my high school encounter with Richard Meale's *Sonata for Flute* was at first a distance too far.

It was dissimilar to all music I had encountered previously and represented a musical world to which I had no connection and limited knowledge. As I became exposed to more diverse musical sounds – as a student, on radio, in concerts – my relationship to this distance was transformed. The sounds remained often perplexing and foreign, however this became a source of intrigue and curiosity. Just as distance is an important structuring feature for producers in the field, in terms of the novelty of artistic creativity, so too distance became something for me to value for the experience it afforded as a listener. It is not that this distance was appreciated in terms of its intrinsic aesthetic value, but that it became a gap whose value lay in the invitation it provides to understanding. This echoes Peter's reflection, observed in Chapter 4, on the development of his own relationship to music he had previously disregarded:

> *Peter:* *I think one of the things of my young adulthood was a gradual process of a dialogue with myself saying everything I hate is a challenge to understand why it's interesting.*

The role of distance becomes inverted – no longer repellent, but 'interesting', and for that reason, even enticing – and serves to disrupt any straightforwardly positive relationship between familiarity and taste. An attachment to the unfamiliar does, however, become intelligible through a nuanced and multi-dimensional approach to the investigation of distance.

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Appendix A Acoustic descriptors

This appendix lists the full set of acoustic features extracted from audio files for subsequent analysis in Chapter 2, and the statistics calculated for each feature. In the terminology employed in this thesis, each combination of feature and statistic constitutes a discrete acoustic descriptor.

All features were extracted utilising customised Python scripts to interface with the 2.1-beta3 build of Essentia (Bogdanov et al., 2013) compiled on Centos 7. For features calculated on series of discrete frames, the mean and standard deviation statistics provided by Essentia were supplemented with calculations of the corresponding mean difference and mean absolute difference between frames. Full details of the corresponding algorithms for each feature are documented at the Essentia website (Music Technology Group, 2018).

In addition to the individual features and statistics extracted, Table A.1 also indicates whether each descriptor was included as a candidate in the analysis (i.e. was among the descriptors retained after dimension reduction in Section 2.3.1.2), whether it met the criteria of being either normally distributed or capable of being transformed to a normal distribution (i.e. was retained after dimension reduction in Section 2.3.1.3), and whether it was among the descriptors retained for combination analysis (see Section 2.3.1.6) after discarding highly correlated descriptors .

Table A.1 List of Candidate Acoustic Descriptors

Feature Category	**Feature**	**Statistic**	**Retained for initial analysis?**	**Normally distributed?**	**Included in Combination Analysis?**
Low Level	Average Loudness	Statistic	✓	✗	✗
Low Level	Dissonance	Mean	✓	✓	✗
Low Level	Dissonance	Mean Absolute Difference	✓	✗	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Dissonance	Mean Difference	✓	×	×
Low Level	Dissonance	Standard Deviation	✓	✓	×
Low Level	Dynamic Complexity		✓	×	×
Low Level	ERB Bands Crest	Mean	✓	✓	×
Low Level	ERB Bands Crest	Mean Absolute Difference	✓	×	×
Low Level	ERB Bands Crest	Mean Difference	✓	×	×
Low Level	ERB Bands Crest	Standard Deviation	✓	×	×
Low Level	ERB Bands Flatness	Mean	✓	✓	✓
Low Level	ERB Bands Flatness	Mean Absolute Difference	✓	×	×
Low Level	ERB Bands Flatness	Mean Difference	✓	×	×
Low Level	ERB Bands Flatness	Standard Deviation	✓	×	×
Low Level	ERB Bands Kurtosis	Mean	✓	×	×
Low Level	ERB Bands Kurtosis	Mean Absolute Difference	✓	✓	×
Low Level	ERB Bands Kurtosis	Mean Difference	✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	ERB Bands Kurtosis	Standard Deviation	✓	✓	✓
Low Level	ERB Bands Skewness	Mean	✓	×	×
Low Level	ERB Bands Skewness	Mean Absolute Difference	✓	×	×
Low Level	ERB Bands Skewness	Mean Difference	✓	×	×
Low Level	ERB Bands Skewness	Standard Deviation	✓	×	×
Low Level	ERB Bands Spread	Mean	✓	✓	×
Low Level	ERB Bands Spread	Mean Absolute Difference	✓	×	×
Low Level	ERB Bands Spread	Mean Difference	✓	×	×
Low Level	ERB Bands Spread	Standard Deviation	✓	✓	✓
Low Level	High Frequency Content (HFC)	Mean	✓	×	×
Low Level	High Frequency Content (HFC)	Mean Absolute Difference	✓	×	×
Low Level	High Frequency Content (HFC)	Mean Difference	✓	×	×
Low Level	High Frequency Content (HFC)	Standard Deviation	✓	×	×
Low Level	Mel Bands Crest	Mean	✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Mel Bands Crest	Mean Absolute Difference	✓	×	×
Low Level	Mel Bands Crest	Mean Difference	✓	×	×
Low Level	Mel Bands Crest	Standard Deviation	✓	×	×
Low Level	Mel Bands Flatness	Mean	✓	✓	×
Low Level	Mel Bands Flatness	Mean Absolute Difference	✓	×	×
Low Level	Mel Bands Flatness	Mean Difference	✓	×	×
Low Level	Mel Bands Flatness	Standard Deviation	✓	×	×
Low Level	Mel Bands Kurtosis	Mean	✓	×	×
Low Level	Mel Bands Kurtosis	Mean Absolute Difference	✓	×	×
Low Level	Mel Bands Kurtosis	Mean Difference	✓	×	×
Low Level	Mel Bands Kurtosis	Standard Deviation	✓	×	×
Low Level	Mel Bands Skewness	Mean	✓	×	×
Low Level	Mel Bands Skewness	Mean Absolute Difference	✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Mel Bands Skewness	Mean Difference	✓	×	×
Low Level	Mel Bands Skewness	Standard Deviation	✓	×	×
Low Level	Mel Bands Spread	Mean	✓	×	×
Low Level	Mel Bands Spread	Mean Absolute Difference	✓	×	×
Low Level	Mel Bands Spread	Mean Difference	✓	×	×
Low Level	Mel Bands Spread	Standard Deviation	✓	×	×
Low Level	Mel Frequency Cepstral Coefficient 1	Mean	✓	✓	✓
Low Level	Mel Frequency Cepstral Coefficient 2	Mean	✓	✓	✓
Low Level	Mel Frequency Cepstral Coefficient 3	Mean	✓	✓	✓
Low Level	Mel Frequency Cepstral Coefficient 4	Mean	✓	✓	×
Low Level	Mel Frequency Cepstral Coefficient 5	Mean	✓	×	×
Low Level	Mel Frequency Cepstral Coefficient 6	Mean	✓	×	×
Low Level	Mel Frequency Cepstral Coefficient 7	Mean	×	N/A	×
Low Level	Mel Frequency Cepstral Coefficient 8	Mean	×	N/A	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Mel Frequency Cepstral Coefficient 9	Mean	✗	N/A	✗
Low Level	Mel Frequency Cepstral Coefficient 10	Mean	✗	N/A	✗
Low Level	Mel Frequency Cepstral Coefficient 11	Mean	✗	N/A	✗
Low Level	Mel Frequency Cepstral Coefficient 12	Mean	✗	N/A	✗
Low Level	Mel Frequency Cepstral Coefficient 13	Mean	✗	N/A	✗
Low Level	Pitch Salience	Mean	✓	✗	✗
Low Level	Pitch Salience	Mean Absolute Difference	✓	✗	✗
Low Level	Pitch Salience	Mean Difference	✓	✗	✗
Low Level	Pitch Salience	Standard Deviation	✓	✗	✗
Low Level	Spectral Centroid	Mean	✓	✗	✗
Low Level	Spectral Centroid	Mean Absolute Difference	✓	✓	✗
Low Level	Spectral Centroid	Mean Difference	✓	✗	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Centroid	Standard Deviation	✓	×	×
Low Level	Spectral Complexity	Mean	✓	×	×
Low Level	Spectral Complexity	Mean Absolute Difference	✓	×	×
Low Level	Spectral Complexity	Standard Deviation	✓	×	×
Low Level	Spectral Crest	Mean	✓	×	×
Low Level	Spectral Crest	Mean Absolute Difference	✓	×	×
Low Level	Spectral Crest	Mean Difference	✓	×	×
Low Level	Spectral Crest	Standard Deviation	✓	×	×
Low Level	Spectral Decrease	Mean	✓	×	×
Low Level	Spectral Decrease	Mean Absolute Difference	✓	×	×
Low Level	Spectral Decrease	Mean Difference	✓	×	×
Low Level	Spectral Decrease	Standard Deviation	✓	×	×
Low Level	Spectral Energy	Mean	✓	×	×
Low Level	Spectral Energy	Mean Absolute Difference	✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy	Mean Difference	✓	×	×
Low Level	Spectral Energy	Standard Deviation	✓	×	×
Low Level	Spectral Energy (High Band)	Mean	✓	×	×
Low Level	Spectral Energy (High Band)	Mean Absolute Difference	✓	×	×
Low Level	Spectral Energy (High Band)	Mean Difference	✓	×	×
Low Level	Spectral Energy (High Band)	Standard Deviation	✓	×	×
Low Level	Spectral Energy (Low Band)	Mean	✓	×	×
Low Level	Spectral Energy (Low Band)	Mean Absolute Difference	✓	×	×
Low Level	Spectral Energy (Low Band)	Mean Difference	✓	×	×
Low Level	Spectral Energy (Low Band)	Standard Deviation	✓	×	×
Low Level	Spectral Energy (Middle-High Band)	Mean	✓	×	×
Low Level	Spectral Energy (Middle-High Band)	Mean Absolute Difference	✓	×	×
Low Level	Spectral Energy (Middle-High Band)	Mean Difference	✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy (Middle-High Band)	Standard Deviation	✓	×	×
Low Level	Spectral Energy (Middle-Low Band)	Mean	✓	×	×
Low Level	Spectral Energy (Middle-Low Band)	Mean Absolute Difference	✓	×	×
Low Level	Spectral Energy (Middle-Low Band)	Mean Difference	✓	×	×
Low Level	Spectral Energy (Middle-Low Band)	Standard Deviation	✓	×	×
Low Level	Spectral Energy in ERB Band 1	Mean	×	N/A	×
Low Level	Spectral Energy in ERB Band 1	Standard Deviation	×	N/A	×
Low Level	Spectral Energy in ERB Band 10	Mean	×	N/A	×
Low Level	Spectral Energy in ERB Band 10	Standard Deviation	×	N/A	×
Low Level	Spectral Energy in ERB Band 11	Mean	×	N/A	×
Low Level	Spectral Energy in ERB Band 11	Standard Deviation	×	N/A	×
Low Level	Spectral Energy in ERB Band 12	Mean	×	N/A	×
Low Level	Spectral Energy in ERB Band 12	Standard Deviation	×	N/A	×
Low Level	Spectral Energy in ERB Band 13	Mean	×	N/A	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy in ERB Band 13	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 14	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 14	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 15	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 15	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 16	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 16	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 17	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 17	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 18	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 18	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 2	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 2	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 3	Mean	✗	N/A	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy in ERB Band 3	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 4	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 4	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 5	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 5	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 6	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 6	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 7	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 7	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 8	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 8	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 9	Mean	✗	N/A	✗
Low Level	Spectral Energy in ERB Band 9	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 1	Mean	✗	N/A	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy in Mel Band 1	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 10	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 10	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 11	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 11	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 12	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 12	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 13	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 13	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 14	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 14	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 15	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 15	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 16	Mean	✗	N/A	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy in Mel Band 16	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 17	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 17	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 18	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 18	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 19	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 19	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 2	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 2	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 20	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 20	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 21	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 21	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 22	Mean	✗	N/A	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy in Mel Band 22	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 23	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 23	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 24	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 24	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 25	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 25	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 26	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 26	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 27	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 27	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 28	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 28	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 29	Mean	✗	N/A	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy in Mel Band 29	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 3	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 3	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 30	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 30	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 31	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 31	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 32	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 32	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 33	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 33	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 34	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 34	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 35	Mean	✗	N/A	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy in Mel Band 35	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 36	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 36	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 37	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 37	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 38	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 38	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 39	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 39	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 4	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 4	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 40	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 40	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 5	Mean	✗	N/A	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Energy in Mel Band 5	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 6	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 6	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 7	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 7	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 8	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 8	Standard Deviation	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 9	Mean	✗	N/A	✗
Low Level	Spectral Energy in Mel Band 9	Standard Deviation	✗	N/A	✗
Low Level	Spectral Entropy	Mean	✓	✗	✗
Low Level	Spectral Entropy	Mean Absolute Difference	✓	✗	✗
Low Level	Spectral Entropy	Mean Difference	✓	✗	✗
Low Level	Spectral Entropy	Standard Deviation	✓	✗	✗
Low Level	Spectral Flatness (dB)	Mean	✓	✓	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Flatness (dB)	Mean Absolute Difference	✓	×	×
Low Level	Spectral Flatness (dB)	Mean Difference	✓	×	×
Low Level	Spectral Flatness (dB)	Standard Deviation	✓	×	×
Low Level	Spectral Flux	Mean	✓	×	×
Low Level	Spectral Flux	Mean Absolute Difference	✓	×	×
Low Level	Spectral Flux	Mean Difference	✓	×	×
Low Level	Spectral Flux	Standard Deviation	✓	×	×
Low Level	Spectral Kurtosis	Mean	✓	×	×
Low Level	Spectral Kurtosis	Mean Absolute Difference	✓	×	×
Low Level	Spectral Kurtosis	Mean Difference	✓	×	×
Low Level	Spectral Kurtosis	Standard Deviation	✓	×	×
Low Level	Spectral Rolloff	Mean	✓	×	×
Low Level	Spectral Rolloff	Mean Absolute Difference	✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Rolloff	Mean Difference	✓	×	×
Low Level	Spectral Rolloff	Standard Deviation	✓	×	×
Low Level	Spectral Root Mean Square (RMS)	Mean	✓	✓	×
Low Level	Spectral Root Mean Square (RMS)	Mean Absolute Difference	✓	×	×
Low Level	Spectral Root Mean Square (RMS)	Mean Difference	✓	×	×
Low Level	Spectral Root Mean Square (RMS)	Standard Deviation	✓	×	×
Low Level	Spectral Skewness	Mean	✓	×	×
Low Level	Spectral Skewness	Mean Absolute Difference	✓	×	×
Low Level	Spectral Skewness	Mean Difference	✓	×	×
Low Level	Spectral Skewness	Standard Deviation	✓	×	×
Low Level	Spectral Spread	Mean	✓	×	×
Low Level	Spectral Spread	Mean Absolute Difference	✓	✓	✓
Low Level	Spectral Spread	Mean Difference	✓	×	×
Low Level	Spectral Spread	Standard Deviation	✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Low Level	Spectral Strong Peak	Mean	✓	×	×
Low Level	Spectral Strong Peak	Mean Absolute Difference	✓	×	×
Low Level	Spectral Strong Peak	Mean Difference	✓	×	×
Low Level	Spectral Strong Peak	Standard Deviation	✓	×	×
Low Level	Zero-crossing Rate	Mean	✓	×	×
Low Level	Zero-crossing Rate	Mean Absolute Difference	✓	✓	✓
Low Level	Zero-crossing Rate	Mean Difference	✓	×	×
Low Level	Zero-crossing Rate	Standard Deviation	✓	×	×
Pitch & Harmonics	Energy ratio between odd and even harmonics	Mean	✓	×	×
Pitch & Harmonics	Energy ratio between odd and even harmonics	Mean Absolute Difference	✓	×	×
Pitch & Harmonics	Energy ratio between odd and even harmonics	Mean Difference	✓	×	×
Pitch & Harmonics	Energy ratio between odd and even harmonics	Standard Deviation	✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Pitch & Harmonics	Inharmonicity	Mean	✓	×	×
Pitch & Harmonics	Inharmonicity	Mean Absolute Difference	✓	×	×
Pitch & Harmonics	Inharmonicity	Mean Difference	✓	×	×
Pitch & Harmonics	Inharmonicity	Standard Deviation	✓	×	×
Pitch & Harmonics	Tristimulus (first harmonic)	Mean	✓	×	×
Pitch & Harmonics	Tristimulus (first harmonic)	Standard Deviation	✓	✓	×
Pitch & Harmonics	Tristimulus (remaining harmonics)	Mean	✓	✓	×
Pitch & Harmonics	Tristimulus (remaining harmonics)	Standard Deviation	✓	×	×
Pitch & Harmonics	Tristimulus (second to fourth harmonics)	Mean	✓	×	×
Pitch & Harmonics	Tristimulus (second to fourth harmonics)	Standard Deviation	✓	✓	✓
Pitch Envelope	Pitch centroid		✓	×	
Rhythm	Beats per Minute (BPM)		✓	✓	✓
Rhythm	Second-highest peak value of the BPM histogram		✓	✓	✓

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Rhythm	Spread of the second-highest peak of the BPM histogram		✓	×	×
Rhythm	Value of the highest peak of the BPM histogram		✓	✓	×
Rhythm	Weight of the highest peak of the BPM histogram		✓	×	×
Rhythm	Weight of the second-highest peak of the BPM histogram		✓	×	×
Sound Envelope	Flatness coefficient of the signal envelope		✓	×	×
Sound Envelope	Log Attack Time		✓	✓	✓
Sound Envelope	Temporal centroid		✓	×	×
Sound Envelope	Temporal decrease		✓	×	×
Sound Envelope	Temporal kurtosis		✓	×	×
Sound Envelope	Temporal skewness		✓	×	×
Sound Envelope	Temporal spread		✓	✓	✓
Tonal	Chords change rate		✓	×	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Tonal	Crest of the harmonic pitch class profile (HPCP) vector	Mean	✓	✗	✗
Tonal	Crest of the HPCP vector	Mean Absolute Difference	✓	✓	✗
Tonal	Crest of the HPCP vector	Mean Difference	✓	✗	✗
Tonal	Crest of the HPCP vector	Standard Deviation	✓	✓	✓
Tonal	Key estimation		✗	N/A	✗
Tonal	Number of peaks in HPCP vector		✓	✓	✓
Tonal	Scale of estimated key		✗	N/A	✗
Tonal	Shannon entropy of the HPCP vector	Mean	✓	✗	✗
Tonal	Shannon entropy of the HPCP vector	Mean Absolute Difference	✓	✓	✓
Tonal	Shannon entropy of the HPCP vector	Mean Difference	✓	✗	✗
Tonal	Shannon entropy of the HPCP vector	Standard Deviation	✓	✗	✗
Tonal	Strength of chord 1 (circle of fifths order)		✓	✗	✗
Tonal	Strength of chord 2		✓	✗	✗
Tonal	Strength of chord 3		✓	✗	✗

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Tonal	Strength of chord 4		✓	×	×
Tonal	Strength of chord 5		✓	×	×
Tonal	Strength of chord 6		×	N/A	×
Tonal	Strength of chord 7		×	N/A	×
Tonal	Strength of chord 8		×	N/A	×
Tonal	Strength of chord 9		×	N/A	×
Tonal	Strength of chord 10		×	N/A	×
Tonal	Strength of chord 11		×	N/A	×
Tonal	Strength of chord 12		×	N/A	×
Tonal	Strength of chord 13		×	N/A	×
Tonal	Strength of chord 14		×	N/A	×
Tonal	Strength of chord 15		×	N/A	×
Tonal	Strength of chord 16		×	N/A	×
Tonal	Strength of chord 17		×	N/A	×
Tonal	Strength of chord 18		×	N/A	×
Tonal	Strength of chord 19		×	N/A	×
Tonal	Strength of chord 20		×	N/A	×
Tonal	Strength of chord 21		×	N/A	×
Tonal	Strength of chord 22		×	N/A	×
Tonal	Strength of chord 23		×	N/A	×
Tonal	Strength of chord 24		×	N/A	×

Feature Category	Feature	Statistic	Retained for initial analysis?	Normally distributed?	Included in Combination Analysis?
Tonal	Strength of estimated chords	Mean	✓	×	×
Tonal	Strength of estimated chords	Mean Absolute Difference	✓	×	×
Tonal	Strength of estimated chords	Mean Difference	✓	×	×
Tonal	Strength of estimated chords	Standard Deviation	✓	×	×
Tonal	Strength of key estimation		✓	✓	✓

Appendix B Composer similarity survey instrument

1. Which International composers (living or deceased) do you consider are musically most similar to your own practice? (List up to five composers)

2. Which Australian composers (living or deceased) do you consider are musically most similar to your own practice? (List up to five composers)

3. Rank[52] the following composers[53] in terms of how similar you regard their overall musical practice to your own

Rank	**Composer**
Most similar	[list of five composers]
	[list of five composers]
	[list of five composers]
	[list of five composers]
Least similar	[list of five composers]

[52] For each ranking, users were presented with a drop-down list containing the names of each of five composers.

[53] The list of five composers was customised for each user invited to participate in the survey.

Appendix C List of Spotify playlists

Table C.1 below lists each of the Spotify playlists included in the content analysis conducted in Chapter 3. The table includes the number of playlisted works included in the analysis, together with the number of followers subscribing to each playlist as of 1 January 2018.

Table C.1 Classical Spotify playlists included in content analysis

Playlist Name	**Curator**	**Category**	**# Playlisted Works**	**# Followers**
Best of Australian Classical Music	ABC Classic	Specialist	966	84
Classical Music for Concentration and Study	ABC Classic	Task	850	727
Classical Music for Mindfulness	ABC Classic	Task	728	301
Classical Sleep	ABC Classic	Task	742	269
New on ABC Classic	ABC Classic	General	502	138
Swoon: Music for Sheer Relaxation	ABC Classic	General	1,019	2,186
The Best Classical Music of All Time	ABC Classic	General	802	328
The Greatest Music in the Movies	ABC Classic	Specialist	904	1,155
Women in Music	ABC Classic	Specialist	388	65
BBC Classical (BBC Radio 3)	BBC Music Playlists	General	2,324	2,355
Chillout Piano	Deutsche Grammophon	Mood	1,100	2,014
Classical New Releases	Deutsche Grammophon	General	1,658	3,650
Famous Classical Works	Deutsche Grammophon	General	201	3544
Great Voices in Classical Music - Choir Edition	Deutsche Grammophon	Instrument	244	311

Piano Masters	Deutsche Grammophon	Instrument	900	10,601
Piano Melancholy	Deutsche Grammophon	Mood	1,231	2875
Reflections	Deutsche Grammophon	General	300	4288
Piano Chill	Filtr Canada	Mood	1,958	64431
Soundtrack for Study	Filtr Canada	Task	2,061	359,021
Classical Music for Reading	Filtr Legacy Sweden	Task	1,200	131,514
Relaxing Classical	Filtr UK	Mood	1,315	231,460
Study With Classical	Filtr US	Task	1,300	5,440
Focus Classical & Electronic	HITS	Task	853	21,379
New & Now Classical	NAXOS	General	270	1,112
NMC curates: new contemporary classical releases	NMC Recordings	General	216	53
Classical New Releases: Spotify Picks	Spotify	General	1,065	416,546
Mørketid	Spotify	Mood	4,760	36,313
Top Latin Classical	Spotify	Specialist	3,400	19,874
Brain Fuel: Music for Studying	unCLASSIFIED	Task	2,486	55,444
Chill Piano	unCLASSIFIED	Mood	2,525	1,389
Listen to This: New Classical Music	unCLASSIFIED	General	1,440	1,846
Movie Music	unCLASSIFIED	Specialist	804	28
Need to Know: Romantics	unCLASSIFIED	Specialist	527	505
Perfect Piano	unCLASSIFIED	Instrument	2,298	78

Appendix D Art music curation in Australia dataset

The data used in the content analyses of radio, playlist and concert data in Chapter 3 has been published as a dataset to support replication and additional analysis. Not all data fields used in the original analysis, such as commercial earnings and detailed acoustic analysis, have been included.

Published as the Art Music Curation in Australia Dataset, the data files and its documentation is available at https://github.com/thelondonsimon/amca-dataset