

The Social Life of Tunes: Representing the Aesthetics of Reception

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Abstract I report on two years of participant observation of traditional musicians in Dublin, Ireland. In Irish traditional music, players from all walks of life gather at pub sessions to play tunes together. Due to the ethos of traditional music, the *representation* of tunes is a constant aesthetic concern. Drawing on the aesthetics of reception, I show how arriving at the proper “text” of a tune poses unique challenges. Rather than simply reading notes on sheet music, traditional musicians must imaginatively read the creative text on a “virtual space” to create art. Making music involves a nuanced process of learning, knowing, and retaining a tune. The tune is not a static entity but one dynamically shaped by its social context and provenance. The social life of tunes suggests that technologies ought to support the practice of practicing seamlessly across the performance-oriented session and the solitary pursuit of skill, while allowing novices a way to conceptualize the historical flexibility of the tune. I will outline a new agenda of *surveilling tradition* to represent the aesthetics of reception. With the burgeoning interest in the collaborative work of tradition, this work provides new perspectives into the creative processes involved in representation.

Introduction

The problem of *representation* has been well documented in the computer-supported cooperative work literature. The ways in which systems capture the world through models and present “new” realities to be read is problematic when designers ignore the everyday interpretive practices of different communities of users (Robinson and Bannon 1991). The problem of how to represent the world

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stems from the reality that human behavior is contradictory and improvisatory (Whalen et al. 2002). Complicating the situation even more, representation is always set in the context of external political (Brown 2001) and cultural forces (Grudin 1988). As a result, representations based on models often do not reflect real-world practice by being too deterministic and inflexible (Shipman and Marshall 1999). Indeed, one might argue that the hallmark of CSCW research is that it has shown how users find creative workarounds to close the gap between what “we must support socially and what we can support technically” (Ackerman 2000).

Robinson and Bannon (1991) bring up the issue of *ontological drift* whereby representations change as they are interpreted by different semantic communities. Like the childhood game of telephone, “the *object of an interpretation* and the *interpretation itself* changes places” between different groups. Their work details how each actor (users, feasibility studies, programmers, etc.) involved in software development subsequently transforms representations of reality, ending up with a final product that is radically different from what users originally wanted.

This paper will expand on the concept of representation. I will present a unique case of a community that has, as its explicit moral and aesthetic concern, the ontological drift of representations, or the sheer heterogeneity of representations. In the community of Irish traditional (trad) musicians, the tune is the object of interpretation. Traditional music implies an orally passed skill, one unencumbered by “modern” artifacts. In contrast to the highly regimented training of classical musicians, traditional music seems to have an almost informal, cavalier attitude towards itself. The following YouTube comment on a famous Donegal fiddler playing outside a pub reflects this ethos:

[Danny Meehan] was playing fiddle in a pub and a mesmerised classical player asked him about the pizzicato style he was using and Danny looked at him bemused and said “Ah now don’t be putting fancy names to just picking at the strings.”

While fidelity to a composer’s wishes on sheet music is valued in classical music, trad musicians routinely disparage texts that rigidly prescribe music making. Tunes often have numerous variations, and most trad musicians cannot read sheet music.

Drawing from two years of participant observation and interviews of trad musicians in Dublin, Ireland, I will show how the ethos of “tradition” poses challenges for system developers. The trad ethos encourages musicians of all skills to gather in pubs, festivals, and homes to play tunes but paradoxically constrains such musicians by prescribing what are the proper representations of tunes. A trad session is not simply composed of expert players but of players in different stages of skill acquisition (Dreyfus and Dreyfus 2005). This melting pot of musicians is precisely the intersection of semantic communities. Significantly, what counts for the right representation depends on a changing reality of what a tune is. Past research has pointed to the significant work involved to achieve (sometimes inflexible or inadequate) representations of a single reality—for example, the work to ensure accurate timesheets (Brown 2001). However, little research has focused

on the fact that representations might need to represent *multiple* realities (Robinson and Bannon 1991).

This paper is not just a story of how ontological drift from reality happens, but, rather, how ontological drift itself is an object of active interpretation. While ontological drift is usually perceived as creeping in an insidious manner, Irish trad musicians are cognizantly aware of and think about drift in the representation of tunes. Drift is not necessarily a bad thing. In fact, the ethos of tradition embraces a meaning of tunes that is transient.

To understand the mercurial nature of tunes, I draw from the aesthetics of reception (Iser 1972; Jauss and Benzinger 1970). This theory of literary criticism helps elucidate how tunes in Irish traditional music only gain meaning when there is text to be “read” (i.e., interpreted and played) by an actor. Tunes are read in both private (solo practice) and public spheres (the session), and their representations have different meanings and readings for those in different skill levels. I will argue that to become part of the tradition requires not only an adeptness in the “virtual work” of reading a text—learning, knowing, and retaining tunes—but an understanding of the aesthetics of reception itself. In other words, the Irish trad musician must be aware that there is no ground truth in a representation and what it represents.

After discussing prior work, I describe the theoretical framework from which I draw my analysis, the aesthetics of reception. My analysis will then detail the process of learning (and creating good art), knowing, and retaining tunes. In each activity, how to read the text and what a text “is” is constantly questioned by me and my fellow musicians. Finally, in the discussion and conclusion, I lay out an agenda for the *surveillance of tradition* to support and represent the aesthetics of reception, thereby bridging novice and professional trad musicians.

Prior Work

Most of the HCI and CSCW research on music has been on Western classical music. Graefe et al. (1996) designed a digital music stand to support the practice and formal performance needs of symphony musicians. Their proposed stand consolidated a tuner and metronome while facilitating personal notations and customized music arrangements. They also cite the need to support communication between orchestral musicians in the pit during rehearsals. Letondal and Mackay (2007) studied classical composers, noting that they rely on paper for creative sketching of pieces but found it hard to integrate computer tools with their paper drafts.

Closest to my research is insightful work by Benford et al. (2012) on the “moral order” of Irish sessions, or “informal gatherings of local musicians in pubs...to play music whose dominant style and repertoire is drawn from the Irish tradition.” They provide an account of how musicians maintain and create tradition in the context of sessions. For example, they note how sessions often have an implied

hierarchy (a session leader who starts many of the tune sets), frown upon overt use of paper artifacts, and have a shared repertoire. They propose designing for “situated discretion,” creating technologies that assist musicians in a session while being discrete enough to not disrupt the moral order. As a case in point, mobile apps for trad musicians might be designed to mundanely integrate with the usual activities in pubs (e.g., chatting and drinking). I wish to differentiate my study in several ways. First, my primary field site is in Dublin as opposed to Nottingham, UK. Unlike the sessions observed by Benford et al., occurrences of other genres of music and the use of paper artifacts (other than at learner sessions) in Dublin sessions were extremely rare. My study also has data from crucial places of learning for trad musicians: festivals and workshops. Second, my focus was less on the dynamics of the session and more on the practices of learning and disseminating tunes. While Benford et al. do call for bridging preparation and performance, I will argue that the boundary between the two is much more hazy. Finally, my work examines in detail the actual usage of technology in the social life of tunes.

There is a body of work on the sociology of the Irish trad community. Such research sometimes describe the availability of technological artifacts, but their particular relevance to the everyday practices of musicians is unknown. For example, O’Shea’s (2008) study mentions recordings only in passing and focuses on how one gradually becomes accepted as a “regular” in a session. Work by Fleming (2004) examines the controversy over the institution of government-supported competitions in Irish trad music. Titon (2001) gives a personal account of fiddle jams and their spontaneity but without detail of how musicians bridge solo and session playing. While Waldron and Veblen (2008) show how sheet music is a “skeleton for learning [Celtic Trad Music]” and provide a useful categorization of learners on a visual/audio spectrum, my work details how musicians reconcile disparate representations to arrive at a skeleton (here, even sheet music is an inadequate base version of the tune). Forsyth (2011) focuses on the pedagogical practices at a fiddle camp for adult learners. She gives a good overview of debates in using sheet music versus audio transcripts but not on how students actually use such artifacts. Veblen (1996) provides a “snapshot” of stability and change with respect to the oral transmission of Irish trad music. While a good intro to trad culture, it omits mention of sessions.

The above works focus on fieldwork in pedagogical settings, not on solo and session settings and discuss little about the social aspects of tunes. Veblen (2008) provides an ontology of online sources for trad musicians but does not discuss how such sources in practice are used. Morton (2005) looks at sessions and non-verbal communication but mostly to advance “performance ethnography.”

The Aesthetics of Reception

In this paper, I draw from the reception theory/history or the aesthetics of reception school of thought from the Konstanz School, namely Wolfgang Iser (1972) and Jauss and Benzinger (1970). These theories are differentiated from other schools of literary criticism that seek to evaluate or interpret literature on the basis of the author's intent or the text as a self-contained script.

The aesthetics of reception (Iser 1972) posits that a literary work is neither the text nor the realization of the text accomplished by the reader. Rather, the literary work is only brought into existence in a *virtual space* (p. 279) where the reader's horizon (horizon being the context or background in Heideggerian terms) and the horizon within which the text appears merge. Iser uses the phrase virtual not in the modern technological medium sense but to convey that this "convergence can never be precisely pinpointed" (p. 279). There is significant work involved in instantiating a literary text that goes beyond both the reader and the blanket text.

Furthermore, each reading, even from the same person, results in a different literary work. Iser (p. 283) says that:

[E]ach reading can never reassume its original shape, for this would mean that memory and perception were identical, which is manifestly not so....Thus, the reader, in establishing these interrelations between past, present, and future actually causes the text to reveal its potential multiplicity of connections. These connections are the product of the reader's mind working on the raw material of the text, though they are not the text itself—for this consists just of sentences, statements, information, etc.

There is a temporal aspect in reading. Text is made meaningful in moments of time through rereading (Jauss and Benzinger 1970, p. 10). Readers view the "text through a perspective that is continually on the move" (Iser 1972, p. 285), establishing a new virtual dimension of the text. Literary texts reconfigure reading into an ongoing *creative* process.

Part of literary criticism's *raison d'être* is to establish the canon. According to the aesthetics of reception, literature with *value* must "be conceived in such a way that it will engage the reader's imagination in the task of working things out for himself, for reading is only a pleasure when it is active and creative....The 'unwritten' part of a text stimulates" (Iser 1972, p. 280). This pleasure stems from the work done in the virtual space which in turn is helped by a creative text and an imaginative reader.

A good text defies readers' expectations, allowing multiple variations of interpretations. The tension in "simultaneously having expectations and [the] feeling that...probably they will be violated" (Fry 2009) gives us aesthetic pleasure. Good fiction must balance between presenting an "illusion" (Iser 1972, p. 289) where we comfortably imagine ourselves in a purely unrealistic world (e.g., trashy romance novels) and merely restating the reality we already know.

Iser suggests that wider, external factors have a relation to the virtual dimension. Upon encountering a text, readers can immediately grasp "a repertoire of familiar literary patterns...together with allusions to familiar social and historical

contexts” (p. 293). This *repertoire* is “continually backgrounded or foregrounded with a resultant strategic overmagnification, trivialization, or even annihilation of the allusion” (p. 293).

Jauss and Benzinger (1970) expand on Iser, creating a broader picture of reader-reception theory. They outline a historical perspective of the aesthetics of reception in three ways (p. 23, paraphrased): diachronically in the relationship of literary works based upon reception, synchronically with reference to current literature, and with relation to the immanent literary development to the general process of history. A historical perspective brings into focus that there is a variable distance between the immediate and potential meaning of a literary work. Jauss and Benzinger (1970) define the “aesthetic difference” as the distance between the given horizon of expectations and the appearance of a new work. When the aesthetic distance between new work and expectations is too large, a long process of reception or other later, new work may need to appear to widen the horizon of expectations and thus close the distance (p. 26). This distance can be measured *historically* in the “spectrum of the reaction of the audience and the judgment of criticism (spontaneous success, rejection or shock, scattered approval, gradual or later understanding)” (p. 14). Hence, the history of reception, the history of changing horizons of expectations, is important. That is, in the context of the past and present, reception theory posits that to ask how a text is to be understood is to ask what texts the author could expect his or her readers to know in the future.

Reader-reception theory offers a useful lens to critically examine representation as a creative process. In my analysis, I will illustrate how the process of music making in Irish traditional music can be conceptualized as the work done in the virtual dimension where the text and reader’s horizon meet.

Methodology and Field Site

I have been previously trained as a classical musician in piano and have a minor in music in which I was educated in (Western) music theory and musicianship. With no prior experience in traditional music, I took active steps to gain enough proficiency in an instrument to sit and participate in sessions. Field work in Dublin, Ireland consisted of enrolling in a tin whistle class for approximately one year at the Dublin People’s College, taking informal Irish flute lessons for approximately one year, participating in sessions, and competing in the Dublin Fleadh (festival). Pub sessions in Dublin and learner sessions at the Comhaltas Headquarters (a government-sponsored, non-profit group formed in 1951 to preserve and promote Irish trad music) were regularly attended (at least once a week). Learner sessions are primarily for adult beginners and allow the use of sheet music or other learning aides. In the course of fieldwork, informants also invited me to attend several house sessions: sessions held at someone’s house. I also joined a group of musicians, learned a set of performance tunes, and competed in the Grúpa Cheoil; this allowed me to gain a perspective into the pedagogical practices of Comhaltas.

I attended two events outside Dublin, the Leitrim Country Fleadh and the Cruinniú na bhFlíúit (The Flute Meeting), a gathering of Irish flute musicians (equivalent gatherings are done for pipers, concertina players, and other trad instrumentalists) in Ballyvourney, an Irish speaking region in Cork. Detailed field notes were taken, and, when allowed/appropriate, photos and audio were also captured.

While the data collected above gives a sense of the amateur's practices in the trad music scene, it excludes the practice of seasoned musicians. For this, I conducted 20 semi-structured interviews with Irish traditional musicians in Dublin. I snowball sampled from an initial pool of informants provided by contacts at the Irish Traditional Music Archive (<http://www.itma.ie>) and O'Donoghue's pub. Interviews ranged from 45–90 min. Informants are identified as P1–20. All non-anonymized proper names in this paper are of well-known professional trad musicians. My methods in part draw inspiration from Fine's (1998) immersive ethnography of amateur mushroom hunters and academic mycologists. In that work, Fine became an active member of the mushroom-hunter community, participating in many of their activities while interviewing professional mycologists.

Tunes Through the Aesthetics of Reception

To set the stage, I will present a brief introduction to music making in Dublin sessions. A session is a gathering of musicians, often in the snug of a pub, to play music together. Musicians play *sets* of *tunes* in a session. A set is two or three tunes played in succession without a pause. Tunes in a set usually have the same meter/rhythm (e.g., jig, hornpipe, or reel). Each tune in a set is typically repeated three times in a row. In turn, most tunes have an A and B part, both of which are repeated twice. The musician who starts a tune is usually expected to lead (i.e., choose) what tunes follow after (thus forming a set).

I now describe how it is that Irish traditional musicians conceptualize tunes. I argue that the concept of the tune can be described in terms of three central processes: learning, knowing, and retaining. All three processes involve both the interaction between text and reader in an uneasy convergence and judgment on what constitutes a good text/representation and reader. These practices bring the tune into existence and are a subject of ongoing discourse in the Irish traditional community. Inherent in this discourse is whether the ways of representing reflect the traditional ethos.

Learning a Tune

Once a trad musician gains some proficiency to play notes on their instrument, lessons nearly always follow the same format no matter what the venue: they begin with a tune. The bare skeleton of the tune is first presented aurally. For example, in

my flute lessons, my teacher, Brandon, would first ask me to start my digital recorder, play the tune once slowly, and then a second time closer to session speed (the speed you would play in public). As I got more comfortable with translating phrases heard into the fingerings of the flute, the lesson would take a more dynamic approach. Brandon would play the tune phrase by phrase, asking me to repeat each phrase on the flute back to him. Slowly, each individual phrase would be added together to form the entire tune. This pedagogical method would give him an opportunity to correct my mistakes and suggest technical exercises or embellishments on the tune.

In more structured settings like the classroom, the teacher might also provide students with what are colloquially called the “ABCs” (a simplified notation system for monophonic music often used for folk music). Figure 1a illustrates Conal O’Grada teaching a jig at the Cruinniú na bhFlúit. I mostly encountered what I will call the shorthand form of ABC notation: notes on the second octave are notched with an apostrophe, rhythm is only roughly expressed with spaces, and notes held longer than a single beat are followed by a dash. The left hand side of Fig. 1a shows Conal’s proprietary key for his flute specific notation of ornaments (e.g., scrapes, glottal stops, and tickles).

That the tune can be represented in ABC notation suggests the existence of the “base version” or “skeleton” (Waldron and Veblen 2008) of a tune. It is from this base version trad musicians can develop their “literary work.” The tune here represents merely a text from which the reader must engage with at the virtual dimension to create a literary work. Where does one get the base version of a tune? In lessons, getting the base version is easy—the teacher provides the text and then proceeds to explain how one might “read” and thus create an aesthetically informed work from it. In one of my earlier lessons, Brandon gave me a set of tunes from Kevin Henry’s album, *One’s Own Place*. He explained that this older style of playing, with a slow rhythmic breathing style, would be useful for a beginner. By explicating the origin of the set with a record source, he is legitimizing both the set (that the tunes are interesting, and that the tunes belong together in a set) and his version of the tunes. P15 mentioned that he was trying to

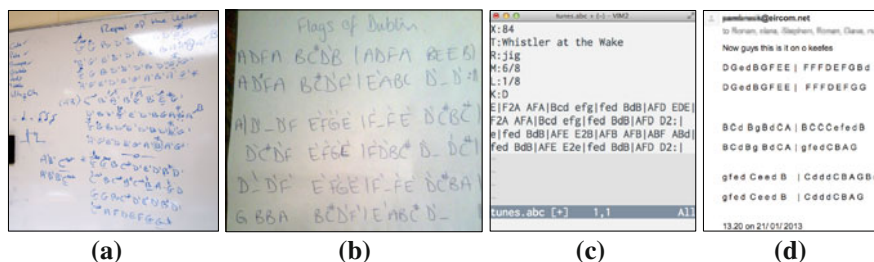


Fig. 1 Left to right: Tune taught at The Flute Meeting, digital photo of tune written in shorthand ABC at a learner session, computer ABC notation of a tune, and shorthand ABC of a tune sent in an email

learn a waltz from Eddie O’Gara but had trouble remembering a certain end phrase: “I mean just this...<plays one phrase>, I just couldn’t remember which one to do...<plays another, similar phrase>...I must actually sit down and find out what <laughs>, what exactly the notes that Eddie’s doing there are.” Here, P15 has a great admiration and respect for Eddie and believes his version to be the right one; i.e., it is the right representation from which to read.

In other cases, a representation may be politically sanctioned. The learner sessions I went to in the Comhaltas Headquarters sell the *Foinn Seisiún* collection. Sometimes jokingly called the “Bible” in Dublin, this volume of three books has a set of three tunes on each page “based on a consensus achieved at our regular Wednesday night sessions held at the Cultúrlann in Monkstown over a two year period.” The sets in *Foinn Seisiún* have become a sort of book of standards around Dublin, and it is not unusual to hear sets from that book (which themselves are sometimes based on sets from famous recordings).

However, aside from official and professional sources, for many of my informants, whatever the source that instigated the liking of a tune becomes the base version. Musicians will sometimes record a “lovely” tune they heard in a session to learn it, but “if I was listening to somebody who was doing an awful lot of variations...I wouldn’t always know which was the tune and which was the variation” (P4). Instrument peculiarities can exacerbate the difficulty in learning the base version. For example, because of the limited breath available to flautists, notes are often left out. At The Flute Meeting, an integral part of lessons was to also query the class about which notes could be tastefully left out. What is one to do when he or she records a tune played on the flute? Are the notes left out because of the player’s preference or does the “true” skeleton of the tune have a rest (moment of silence) at that moment? The reader here is left questioning the “real” representation of the tune before him or her because of the possibility that it is a model that veers far off from the original reality.

Many trad musicians go further than the initial hearing and look up multiple texts of the tune to triangulate representations. Online tune repositories are commonly used by beginning trad musicians, especially those with a classical background. The Session (<http://thesession.org>) is by far the most popular site for tunes, but over time trad musicians come to understand that the quality of representations posted can be questionable. A common problem I encountered were transcriptions that were too accurate or literal (picking up on all the ornamentations and variations of a recording). Going to the tune’s discussion section is imperative: “a lot of people in the sessions[.org] will go in and say, ‘Here, this is a load of bollix; here’s the settin’ I have.’ So you generally go down...and...get a better setting of the tune” (P13). When looking up McGibney’s Fancy (hornpipe), P12 browsed through the comments and found a link to a YouTube clip of “a flute player...June McCormack...It was a very nice arrangement so I decided to learn it [her version].” At times, discussion sections point to better tune repositories (Henrik Norbeck’s *Abc Tunes* are well regarded).

Again, we see here that the legitimacy (by whatever metric one’s own trad ethos has) of a base representation is important. Yet, learning from professional or

historic recordings can have the same problems as tunes gleaned from sessions. For example, to learn tunes composed by Josie McDermott, I went to the Comhaltas Archive (<http://www.comhaltasarchive.ie>) and found clips of Josie playing his own tunes, but even his playing of the same tune differed across clips. Which is the correct one?

Discerning the quality of a tune representation from which to begin the task of “reading” to create a personal version is a learned skill. Expert trad musicians intelligently amalgamate a “heterogeneity of content” (Chalmers and Galani 2004) to arrive at the text. Trad musicians think hard about the context in which the tune will be played. P2 called this finding the “session version” of the tune: “a common accepted version...that’s played in your average session.” P18 learned a tune from a Brian Hughes CD and once she tried playing it in sessions she found that “with that high part in it...I’d hear other musicians say that’s not the [standard] way....So I’d kind of change then till I’m...more similar with those.”

One might imagine that if you learned the tune from its composer, that would add credence to your version. Yet, even a transcription written down by the composer has no guarantee of its usability. Michael Clarkson records tunes for people to learn on his blog (<http://irishflute.podbean.com>). Ed Reavy’s Maudabawn Chapel (reel) has the following post: “I tried looking at Reavy’s book ‘Where the Shannon Rises’...but this just reinforced my view that none of his tunes are normally played the way he wrote them....Here’s an attempt at an average of the myriad settings of this tune.”

Creating Value Art

Learning a tune means finding the tune’s base text. I described the multitude of ways to reach this text. Once a suitable text is found, however, the work begins to create art in the virtual space—where text and the reader’s horizon must reconcile. Professionals build upon the base text to create value art, art that is aesthetically valuable. Yet, this reading is not done in isolation; there is a balancing act in reconciling one’s own personal vision of a tune with that of the session standard. The session is where history comes into play and aesthetic differences can be measured.

Indeed, the trad ethos is against a mechanistic reading of the text. Ornaments (embellishments such as cuts and rolls on existing notes) and variations (adding or deleting notes) are always introduced to the base version of the tune. Echoing the trad musician’s spirit in *The Flute Meeting*, Conal O’Grada called the word “ornament” a misnomer; without ornaments, trad music loses its essence (e.g., rhythm lift, melodic excitement). P8, a teacher of trad music to primary school children, emphasized the need to not become “over-taught,” becoming a clone of Mary Bergin [a famous tin whistler] and playing “every tune exactly as the person who taught you.”

Trad musicians learn to discern when a variation is tasteful for a session. While lacking formal training in music theory, they have an instinctual feel for what variations will *harmonize* with the players' versions (or the standard session version). If the variation you have veers too far, "they can actually clash and make it uncomfortable for one...or both players" (P2). One flute player I met at The Flute Meeting told me she tried to learn The Copperplate reel from a recording by Seamus Tansey, but his version varied so far from what was played in Dublin that she had to "relearn" it. Harmonizing is not just about pitch but utilizing complementary timbres; P17 notes "the fiddle compensated for the flute player having to take breaks...[by playing] a long note." Of course, the session, with its critics, does not override the player's own aesthetic. P4 "would have a mixture of other people's variations and my own variations and whatever you're playing at the time." Likewise, P18 ended up forming a personal version of a tune where she would "play the second part differently and then the next time round I might...half [play it] the right way and then maybe change it around." The "right way" refers to the (local) session version of the tune.

Musicians not only create value art by reading a base text, but by determining whether a tune has the potential for value when read. P17 related how she was preparing for a gig in Belgium, and the leader of the band wanted her to learn The Mystery reel. She recorded him playing the tune on her mobile phone. Yet, when she played back her recording she "thought there is a lot more to that tune than that":

Sometimes for me the music is a bit empty or something like that, there isn't enough in it to really show the tune for *what it is*...and I sort of thought, I think that Mystery reel is a nice tune but I'm not really hearing it there so I [had to] look it up somewhere else. [emphasis added]

P17 searched on YouTube and found Frankie Gavin playing The Mystery reel 20 years ago in *Come West Along the Road* (an Irish documentary show of trad musicians) and "thought, wow, this is a great tune!" Here is an example where the base version alone does not reveal the multiple variations of interpretation possible with it. One needs to hear how others have read the tune. To draw the analogy, other players serve as artistic critics. By showing how the text is full of possibilities, one can see the value of the text itself—how it is full of unexpected readings. P17 deemed The Mystery reel as a value text, one to add to her repertoire to share with others.

I have described the "testing" of an art piece in the public; in other words, the testing of the personal vision of a tune in a session. Trad musicians become deft at recognizing good transcriptions, performances, and recordings before synthesizing these versions with his or her style. A performed tune represents consideration of its social properties.

Knowing a Tune

What does it mean to *know* a tune? You can learn a tune, but to know a tune is a different thing altogether. P6 muses that “comfort is relative....There’s...gigs, playing solo on a stage, playing in a band on the stage, there’s different layers....I could just practice it [tunes] today and have them ready....I would call that still knowing the tunes, you know?...They’d never be 100%. I’m resigned to that at this stage.” Informants conceptually separated their solo repertoire from their other tunes. The solo repertoire is meant for gigs and “party pieces” (virtuoso tunes).

While the session is a place to demonstrate one’s aptitude in folk art, it can also serve as a support mechanism for *incomplete knowledge*. P8 says that the practice for a session tune might be different: “there are certain tunes you might just play once or twice at home just so you have it for a session but it mightn’t be one that you’d call up on to perfect it for other reasons.” P20 noted that she has “hundreds of tunes that you can play to a 50% standard in a group situation, but once you put a microphone in front of you, you really have to...play tunes that I know very well, and they are definitely the tunes that I’ve sat down and played for an hour or two at home.” One can see the session as a place where people take risks. Players sometimes look for sessions with enough people so you can “hide” amongst them. P11 related an attempt at trying out a new tune in a session: “I tried to play it in the session. I didn’t play it that < laughs >, but the other people didn’t know it you see.” P19 abhors this notion of knowing many tunes incompletely: “I think it’s much more important to have a bunch of tunes that at least you can play well.” Trad musicians generally admonish solo playing in sessions because (1) it seems to violate the moral code of collaborative music (Benford et al. 2012), and (2) it puts the technical prowess of the player in the spotlight. The risk of unintentional solo playing occurs when one misjudges the repertoire of the session or is unable to play at least the beginning of the tune recognizably so. P7 noted that “you want to avoid them hearing you by yourself...for even a few seconds, you’d rather not that they hear you.” Thus, musicians, when starting sets, often draw from their solo repertoire; at The Flute Meeting, I observed professional musicians often playing tunes from their CD albums. For trad musicians, the “correct” representation may be bits and pieces of text that can be filled in by others in situ in a session.

Indeed, all informants except for one dismissed any sort of routine practice regimen; instead, they relied on the session to practice tunes *iteratively*. On the rare occasions when particular tunes remained imperfect for lengths of time despite repeated session visits, informants would then actively practice. P13 remarked that he kept hearing the same tune in a session but never could get a certain part down: “I actually sat down to learn it properly...cause I half had it [a Paddy O’Brien tune], I played it thinking I was right, but I wasn’t sure.” P11 says, “if it’s a session tune, you kind of half know it, [if] there’s little bits that are quite tricky, it’s quite useful to see it written down. To get the details, you know?” Here, conversely, incomplete knowledge gained through a session can be ameliorated

through formal representations of tunes. Thus, solitary practice is only part of the picture. As P1 put it, “I regard...playing in sessions as a form of practice.” P20 emphasized that “if you’re not meeting people, to keep up the motivation to practice is very difficult.” The session and private place are mutually constitutive spaces for practice.

To say that the musician’s repertoire is what tunes he or she knows is an oversimplification. All trad musicians rely on a hazy form of representation that only comes into shape within a session. This collaborative aspect of readers with text brings tunes into existence. Of course, those tunes that the musician are comfortable with have a form of representation not as dependent on their peers in the session. For seasoned musicians, the act of finding tunes is never about seeking solid representations of tunes (i.e., books or collections): “I haven’t felt the need to go and look for tunes in books because I...often hear new tunes at sessions and at parties and things” (P4). These musicians absorb the tunes through intuition (Dreyfus and Dreyfus 2005), describing it as osmosis through iterative exposure to the representations of music making. It is less about *finding* tunes but, rather, *stumbling* upon them. In fact, many musicians almost describe it as inevitable, no matter how long, that the tune will become part of them. One musician (P15), without any hint of shame, remarked that the “process took about two years” to know a particular tune.

Retaining a Tune

A perennial problem for trad musicians is retaining a tune. Seasoned musicians know thousands of tunes. While they can play them, they don’t know their names. Sometimes, the tune’s name can serve as a recall device for the melody. Tunepal (Duggan and O’Shea 2011), a mobile app that records a tune, transcribes it, and queries a database to find its name, was by far the most popular app for trad music encountered in my observations. In this section, I will focus on other contextual cues used to retain a tune.

Tunes are associated with people, places, and events. Family, friends, hometowns, holidays, etc. all serve to dust off old sets of tunes. P4 called them “associations”: “you might remember who you heard playing it and what it sounded like and where you heard it.” P20 noted that she has “a friend in Antrim and we would always play [the] Paddy O’Brien jig <sings melody>. We would always play that together but it was because we learned it together.” P17 related, “a guy...from Westmeath, he plays accordion, there’s always tunes that I play with him and I always call them the ‘Wexford tunes.’” Whenever I attend a session, seeing people’s faces immediately summons up possibilities of playing: their favorites and styles. For example, I know Mary Begley, the concertina player, likes to play steady barn dances and hornpipes.

P17 stated that if you knew of the tune’s *provenance*, “information about the composer or why it was composed or what the name means or...the style, or where

you learned it or the style of that player,” you would retain the tune because, as P1 explained, “it’s a hook into your memory.” This sentiment was echoed by all the informants. It could be said that all trad musicians have a bit of the ethnomusicologist (academic) in them (Fine 1998). Calling back to Iser, texts are imbued with a sociohistorical context that influence our expectations when we read. Ergo, the meaning of the tune goes beyond its notes. Provenance allows us to place the tune in a situated repertoire of tunes in the past, present, and future to create new art (legitimizing it). A common question amongst trad musicians in a session is not just, “What is the name of that tune?” (Benford et al. 2012) but, “Where did you hear that tune from?” A story about the tune, perforce, follows in answer to the latter question.

Other than Tunepal, the most common artifact encountered was a paper notepad (or mobile app equivalent) where musicians would notate in their own shorthand tunes they heard. Other than audio recordings, tune names, or actual notes of the tunes, informants also added contextual clues. P20 knew that she would not get back to her recordings the next day, so she would always “leave myself clues in the [file]names [of the recordings].” For example, one recording was labeled, “Roaring Barmaid Nathalie 3 versions,” indicating three versions of the tune played by Nathalie.

Novices: Representation and Conflict

The above findings primarily show the practices of seasoned traditional musicians. For novices, though, there is a clearer distinction between home and session practice; for example, when P11 first started playing she would keep a list of “all the tunes they played in Hughes [pub] in 1990...on the computer.” Similarly, I kept a list of tunes to learn (notated with how comfortable I was with each tune) that codified the repertoire of the pub.

The repertoire of the pub is ever changing. Tunes go in and out of fashion. During a learner session, the leader of the group explained that we would be learning a new tune every few weeks. She expressed a desire to teach us common tunes heard “now.” She explained that while the Foinn Seisiún books has common tunes, many of them are not played as much anymore in Dublin. Depending on the musician and session, there can sometimes be a stigma against common tunes. P2 explained his observations that “I have seen certain musicians...put down their instruments [to not play a tune]—certain really advanced musicians when you play one of...those baseline tunes.” The Foinn Seisiún volumes can, depending on the skill of the player, represent an especially inflexible representation because it prescribes what are the proper sets—what tunes belong in a set. Players can feel bored when they expect and know what the next tune is. There is no, as Iser puts it, “illusion”; instead, there is simply a restatement of the reality informed by the Comhaltas agency and no opportunity for possibilities. Good texts have a balance of the familiar and unfamiliar; if our expectations are always fulfilled, there is no

chance for pleasure in reading. In a house session I attended, the guitarist complained that because each page had room for three tunes, sometimes you get two tunes that belong together with one “straggler” that seems forced in the set. One professional related to me that he attended a session in the Comhaltas Headquarters in Monkstown, Dublin; when he played a set of tunes that did not follow the order prescribed by the Foinn Seisiún, he was told that next time he needed to play them in the “correct” order. My informant was less than pleased by this. Creating sets is creating art.

The formal representation of ABC notation can impede novices. As Fig. 1 shows, there is the computer and shorthand version of ABCs. For example, the computer ABCs, which can be compiled into a MIDI or sheet music image, represents notes on the second octave with a lower case note letter. Note durations are specified by multiplying the note by a number (e.g., “a2” means to hold the note “a” on the 2nd octave for two beats). All online repositories of folk tunes store tunes in the computer ABC format. Beginners, who cannot read sheet music, often end up printing the computer ABCs and have difficulty interpreting them as they differ from the shorthand ABCs used by teachers. The difficulty of ABCs is further exacerbated when attempting to reconcile sheet music with shorthand ABCs. Figure 2 shows the handouts passed by Comhaltas when preparing for the Grúpa Cheoil competition: an ensemble performance of tunes. Here, instruments are asked to come in and leave at certain points of the music. The teacher has specified line numbers of the music with respect to the shorthand ABCs. These lines do not match up with the lines of the sheet music; as a result, I had to notate my sheet music with the respective lines. This caused constant confusion during rehearsals between those who used a sheet music representation and the ABC representation. Finally, because of its ubiquity, shorthand notation is often sent electronically (Fig. 1b); Fig. 1d shows an email sent to me regarding a tune called O’Keefe’s heard on the radio. My colleagues had trouble deciphering his ABCs because there is no indication of the rhythm (e.g., slip jig versus jig versus slide); each space separated notes rather than rhythmic phrases.

Novices trained in classical music may face difficulty reconciling their formal training with the apparent flexibility of trad music. In classical music the distinction between wrong and right notes is clear. Parents of some informants had their children initially enroll in classical music to learn the proper posture for holding a fiddle but “were really conscious...of taking me out” (P1). Classical music can interfere with trad practices. P13 says it “demands a clarity in the note being made that...doesn’t sound proper in a traditional idiom.” The flute for example is capable of producing a note between C-sharp and C-natural. Below is an excerpt from my fieldnotes where I had to force myself to relax the strictness of my classical training (no easy task):

My teacher asked me to listen to Kevin Henry’s CD. I used the Amazing Slow Downer application to hear each note, but on one tune, *Paddy Jim Frank*, I could not tell what the note in a particular phrase was despite repeated listening. I couldn’t even tell what octave it was on. To make matters worse, the recording quality was poor. Thinking it was my own inability to discern the pitch, for my next lesson, I sat down with my teacher (Brandon),

TITLE	READ IN/NO	KEY	(STRATS)	LINKS	LINKS	LINKS	LINKS
HANDING THE BATTLE (VOICE)		G (4/F)	B G C D E G	LINK 123	LINK 123	LINK 123	LINK 123
The Princess Royal (O'Connell) (VOICE)	A (4/F)	E (4/F)	E E E A A	LINK 123	LINK 123	LINK 123	LINK 123
A Star No Chair (Hill) (VOICE)	C (4/F)	E (4/F)	A A A A A	LINK 123	LINK 123	LINK 123	LINK 123
Mount Phoenix Hunt (Set Dance) (VOICE)	E (4/F)	G (4/F)	G B B B B	LINK 123	LINK 123	LINK 123	LINK 123
The Green Groves of Erin (Reel) 3 Times	E (4/F)	A (4/F)	A A A A A	LINK 123	LINK 123	LINK 123	LINK 123

Fig. 2 Arrangement of tunes for the Grúpa Cheoil competition. Left: shorthand ABC notation for the arrangement; Right: sheet music equivalent for the arrangement

played the recording, and stepped through the tune to the problematic phrase and asked “What note is this?” Brandon simply grinned and shrugged. For him it wasn’t a big deal, as if I could decide what note it was!

Indeed, certain tunes take advantage of this ambiguity (on each tune repeat one might make the pitch ambiguous, switch between two different pitches, etc.). P8 rebuked adult learners who “follow what’s written so exactly that...it just doesn’t have a traditional feel to it.” Thus, transcriptions, as opposed to aural learning, “aren’t great if you’re just coming from outside...[it’s] just the skeletal framework.” (P8) Sheet music has codified notation for ornaments (e.g., grace notes); this can cause novices to interpret notated ornaments as set-in-stone (as part of the skeletal tune). The rhythm of a transcription can be misleading; Tunepal allows MIDI playback of ABC transcriptions. P2 related that “it doesn’t sound like Irish music at all...no swing.” Only with mastery of trad music can you sensibly use a transcription.

Underneath all these issues of representation is an explicit ethos that learning by ear is the only way to know and retain a tune. Musicians constantly told me that tunes learned from sheet music do not stay in the head long. The sheet music is artificially separated from the context (e.g., provenance) of the tune. Consider also that learning from recordings or sessions allows one to hear the tune repeated several times by the same player(s). These different readings enable us to imagine the possibilities of the text. We listen to the critic. Next, I will consider how we might be able to support and hence represent the aesthetics of reception intrinsic in trad music.

Representing the Aesthetics of Reception

Every tune is an opportunity...to make it interesting.—P2 “Drift” in ontological drift brings to mind representations whose meanings progressively meander away from the truth. However, in the case of traditional musicians, there is no single truth to a representation. Each time a tune is played, masters of Irish traditional music literally make art anew in the virtual space where the musician’s horizon and the horizon within which the tune’s representation resides intersect. Finding the right representation of a tune is not easy. Sometimes, the text proves too literal or restrictive, reducing the possibilities of interpretation. Other times, the text proves too abstract and vague, masking its value and making it unattractive for musicians to read. These texts reflect the observation of Lee (2007) that “unstandardized artifacts that are partial, incomplete, or are intermediary representations are ubiquitous in collaborative work.” When Star and Griesemer (1989) and Lee (2007) talk of boundary (negotiating) objects, they speak of material artifacts. However, instead of trying to decipher when a tune becomes “materialized” (e.g., when it is played), I believe it more constructive to emphasize the creative process involved in representation via the lens of reader-reception theory.

By highlighting how representation of a tune is a central, ongoing concern for trad musicians, we can move towards a more nuanced notion of what it means to become proficient in the tradition. Benford et al. (2012) suggest several requirements for the “sequencing of tunes” that certainly would follow my own findings about tunes—for example, knowing who is present (and what tunes they know) and what tunes are popular in a session. However, I am interested in how novices can go beyond being what informants disparagingly called “tune fiends” or “tapeworms.” How might a novice move past simplified representations of tunes to attain the intuitive (Dreyfus and Dreyfus 2005) grasp of tunes that experts of trad music have?

I have shown how experts of trad music have learned how to attain a balance of their own aesthetic vision of tunes with the ethos and history of sessions by adroitly synthesizing heterogeneous actors. The tune, personal and social at the same time, is a careful amalgamation of the session, teachers, associations, audio/video clips, ABCs, aesthetic values, etc. Artifacts to support budding musicians must recognize this aesthetic sensibility of the Irish tradition. That is, how would the novice know that the transcription they have is a good one to base their creative pursuits on? “Good” might be based on the author of the transcription or who played the tune. How does the novice know that their variation harmonizes with others’ variations (and at what point does the variation become distasteful)? Musicians must also take a risk (e.g., introducing new tunes) to prevent a session from going stagnant. How might one know that a tune will be absorbed into the session repertoire? This also raises the question of how a musician would recognize that the tune offers creative reading. Systems supporting musicians may need to automatically or via crowd-sourcing methods rate the quality of a transcription

(on different levels such as its suitability for particular instruments). In other words, we need to support the *criticism* of tunes.

The flexible and social nature of tunes in its various processes poses non-obvious constraints for tools to model/organize tunes. Current software for folk musicians (e.g., ABC tune organizers, media library apps) still rigidly represent tunes. Tunepal adjusts algorithmically for variation in tunes, but its tune manager simply is a list of static ABC tunes by their name. Tune transcriptions and audio recordings that are posted on online repositories are often divorced from their context. How might systems assist musicians in retaining tunes not only by their titles but by their provenance?

My results suggest it useful to conceptualize the session not merely as the performance apex, but rather a place of active practice. Incomplete knowledge of tunes, even amongst experts (who are adept at cheating—filling in harmonious patterns—to figure out a tune on the fly), is the *sine qua non* of being a traditional musician. Indeed, an ideal for many novices to reach is an ability to pick up and learn tunes in the session itself. In the past, the old guard players like Patsy Hanly had to rely on their memory, picking up phrases here and there each time they went to a teacher or session. Learning was an iterative, aural, and social process. How might this ability to practice in, rather than for, sessions be facilitated? Moreover, how does a musician choose *how to know* tunes (whether to rely on incomplete knowledge or not)?

Finally, the tension between classical and Irish traditional music pedagogy can pose a challenge for novices. I observed some musicians never being able to take that extra step to go beyond merely playing tunes as written or heard; every reading of the text satisfied expectations, leading to the creation of a soulless literary work. Are there ways to represent the interpretive flexibility of tunes for novices who lack the aural skills of masters? Can artifacts show the stylistic possibilities for a base tune? For example, websites featuring a single tune played by many masters (e.g., <http://rjhetc.blogspot.ie>) are a useful resource when practicing alone to understand that there are many tunes inscribed in a single tune.

What I am suggesting here is that we support and represent the aesthetics of reception. As a literary theory, the aesthetics of reception asserts that all literary works only take shape when text and reader cross a virtual space. However, I believe that reader-reception theory is especially appropriate for Irish trad music because its moral and aesthetic imperative is the active creation of value tunes through persistent participation in sessions. Refocusing our gaze from the reader, from the text, and instead to the virtual dimension in which the two converge, allows us to see that music making in the tradition is about creative texts and imaginative readers constituted in their sociohistorical contexts to create tunes. How can we represent this in a way that will help both novices and professionals? In the next section, I suggest one approach that might help bring novices to adopt the aesthetics of reception.

Surveilling the Aesthetics of Reception

Below, Jauss and Benzinger (1970, p. 295) define literary criticism's utility:

Perhaps this is the prime usefulness of literary criticism—it helps to make conscious those aspects of the text which would otherwise remain concealed in the subconscious; it satisfies (or helps to satisfy) our desire to talk about what we have read.

I have shown that being a trad musician involves an expanded notion of what it means to learn, know, and retain a tune. Becoming a folk musician involves cultivating a musical taste that balances between one's own aesthetic goals and that of session players. The tune, the text, itself is not a static entity, but rather shaped by its sociohistorical context. Neither is the reader a static entity. The implication here is that technology should support a musician's practice in a seamless boundary between the ostensibly performance-oriented session and solitary pursuit of skill. Furthermore, technology ought to allow one to discuss the aesthetics of reception in the trad community. How might this discussion be realized?

The aesthetics of reception involves virtual work in the tune's representation when learning, knowing, and retaining a tune. If we were able to observe, collect, and report data on solo and session practice—what variations are played, what sources the tune's text comes from, who played the tunes—we could create a history of reading, or a history of the aesthetics of reception. A historical archive of reception would alleviate the rigidity of computational representations of tunes. Such an archive would illuminate what texts are valued right now in its socio-historical context (i.e., synchronically and diachronically). By making the music-making practices of people and sessions overtly public, we make reading practices public, thereby supporting the practice of practicing both privately and in the session. Just as the “quantifiable self movement” makes everyday activities visible, might musicians as well present their own quantified data about their tune practices? This suggests a future agenda to designing tech for folk arts: *how can we best surveil tradition?*

Establishing an agenda of the surveillance of tradition brings with it the following lines of inquiry:

- How can we visually support active reading during a session, where practice often happens? Can we visually present the tune or set being played in a session and its variations? How can session participants add their own information/comments into such a system (e.g., adding provenance data or critiques to the tune they just played to the system)? These representations should be accessible to both classically and traditionally trained musicians while being flexible, demonstrating the possibilities of the tune.
- How can we intelligently combine solo and public practices together visually and aurally to support the history of reading? How can we present what tunes are currently popular (synchronic), have been popular in the past (diachronic), are often combined with other tunes in a set, and are often associated with a

particular musician? What tunes seem to never take off? Can we *characterize* a session's aesthetic (e.g., fast-paced or influenced by the East Clare style)?

- What are the implications for creative practices in a session when trends of tunes are presented visually and immediately? For example, will musicians suddenly be conscious that they often play the same tunes? Will they worry about becoming stale and change their habits, defying expectations?
- What are the implications in making the history of the aesthetics of reception available to those outside the session? We might not only present the history of reception locally, but also on the Internet (e.g., on Twitter or a continuously updated website). Will this encourage novices or non-regulars to attend pub sessions? Will Dublin practices of reading exert a powerful influence over other locales' reading practices?
- What are the ethical implications of so closely surveilling tradition (i.e., un-blackboxing the mystique of tradition transmitted orally)? My use of the word "surveil" is to deliberately bring such controversies to the forefront. Technologies that enable the surveillance of tradition may be rejected by the community (Mainwaring et al. 2004) as being the very antithesis of tradition.

With the developer of Tunepal (Duggan and O'Shea 2011), I am currently designing and developing TuneTracker, a system to surveil tradition in a Dublin pub. This system will be permanently and continuously running inside a pub. Tunes and their variations that are recognized in the pub's sessions will be publicly displayed in the pub and also online on a website. Part of the challenge will be in designing an interface that allows users to engage with and comprehend an archive of music-making practices. While continuing my participation in the session, this "social experiment" will allow me to see how the history of tradition (reception) might help or hinder both novices and professionals in the social life of tunes.

Chalmers and Galani (2004) suggest that interactive systems be designed to provide a "heterogeneity of content...when users have different past experiences to draw from, when they have different tools available and yet wish a shared experience, and when the designer's and the users' interest is in the ambiguous or contradictory." Irish traditional musicians are exactly these users; I have shown that deft trad musicians draw from multiple and sometimes ambiguous or contradictory representations to realize a tune in the session experience. The history of tradition via surveillance can achieve a heterogeneity of content and "make past activity across media a resource for ongoing or synchronous activity in each medium" (Chalmers and Galani 2004).

Following Jauss and Benzinger (1970), I believe that exhibiting the "process of the history of reception" can allow novice musicians to assimilate the aesthetics of reception so central to Irish traditional musicians. Surveilling tradition, when designed properly, might give some structure to novice players without losing the inherent ambiguity and flexibility of tune representation that allows tradition to be aesthetically enjoyable. I have described the difficulties that Irish trad musicians have in both finding an adequate representation of a tune and in simply defining what is the true reality of a tune. According to the skill expertise of musicians,

conflicts of representation pose barriers for musicians to move towards achieving value tunes. By making explicit not only the now but the past, we can understand the process by which tunes are creatively made part of the canon of the future.

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References

- Ackerman, M. (2000). The intellectual challenge of CSCW: The gap between social requirements and technical feasibility. *Human-Computer Interaction*, 15(2/3), 181–203.
- Benford S., Tolmie P., Ahmed, A.Y., Crabtree, A. (2012). Supporting traditional music-making: Designing for situated discretion. In *Proceedings of CSCW'12* (pp. 127–136). New York: ACM.
- Brown, B. A. T. (2001). Unpacking a timesheet: Formalisation and representation. *Computer Supported Cooperative Work*, 10(3–4), 293–315.
- Chalmers, M., & Galani, A. (2004) Seamful interweaving: Heterogeneity in the theory and design of interactive systems. In *Proceedings of DIS'04* (pp. 243–252). New York: ACM.
- Dreyfus, H. L., & Dreyfus, S. E. (2005). Peripheral vision expertise in real world contexts. *Organization Studies*, 26(5), 779–792.
- Duggan, B., & O'Shea, B. (2011). Tunepal: searching a digital library of traditional music scores. *OCLC Systems and Services*, 27(4), 284–297.
- Fine, G. A. (1998). *Morel tales*. Cambridge: Harvard University Press.
- Fleming, R. C. (2004). Resisting cultural standardization: Comhaltas Éireann and the revitalization of traditional music in Ireland. *Journal of Folklore Research*, 41(2), 227–257.
- Forsyth, M. C. (2011). Teaching “Trad”: A fiddling ethnomusicologist's reflections on fiddle camp. *Canadian Folk Music/Musique folklorique canadienne*, 45(2).
- Fry, P. H. (2009, January 30). Configurative reading [<http://oyc.yale.edu/transcript/454/engl-300>]. ENGL 300: *Introduction to theory of literature*. Lecture conducted from New Haven, CT: Yale University.
- Graefe, C., Wahila, D., Maguire, J., & Dasna, O. (1996). Muse: A digital music stand for symphony musicians. *Interactions*, 3(3), 26–35.
- Grudin, J. (1988). Why groupware applications fail: Problems in the design of organizational interfaces (pp. 85–93). In *Proceedings of CSCW'88*. New York: ACM.
- Iser, W. (1972). The reading process: A phenomenological approach. *New Literary History*, 3(2), 279–299.
- Jauss, H. R., & Benzinger, E. (1970). Literary history as a challenge to literary theory. *New Literary History*, 2(1), 7–37.
- Lee, C. P. (2007). Boundary negotiating artifacts: Unbinding the routine of boundary objects and embracing chaos in collaborative work. *Computer Supported Cooperative Work*, 16(3), 307–339.
- Letondal, C., & Mackay W. E. (2007). The paperoles project: An analysis of paper use by music composers. In *Proceedings of the 2nd International Workshop on Collaborating over Paper and Digital Documents (CoPADD'07)*.
- Mainwaring, S. D., Chang, M. F., & Anderson, K. (2004). Infrastructures and their discontents: Implications for ubicomp. In *Proceedings of Ubicomp'04* (pp. 418–432). Berlin: Springer.
- Morton, F. (2005). Performing ethnography: Irish traditional music sessions and new methodological spaces. *Social and Cultural Geography*, 6(5), 661–676.
- O'Shea, H. (2008). *The making of Irish traditional music*. Cork: Cork University Press.

- Robinson, M., & Bannon, L. (1991). Questioning representations. In *Proceedings of ECSCW'91* (pp. 219–233). Norwell, MA: Kluwer Academic Publishers.
- Shipman, F. M., & Marshall, C. C. (1999). Formality considered harmful: Experiences, emerging themes, and directions on the use of formal representations in interactive systems. *Computer Supported Cooperative Work*, 8(4), 333–352.
- Star, S. L., & Griesemer, J. R. (1989). Institutional ecology, 'translations' and boundary objects: Amateurs and professionals in Berkeley's museum of vertebrate zoology. *Social Studies of Science*, 19(3), 387–420.
- Titon, J. T. (2001). *Old time Kentucky fiddle tunes*. Lexington: University Press of Kentucky.
- Veblen, K. K. (1996). Truth, perceptions, and cultural constructs in ethnographic research: Music teaching and learning in Ireland. *Bulletin of the Council for Research in Music Education*, 129, 37–52.
- Veblen, K. K. (2008). The many ways of community music. *International Journal of Community Music*, 1(1), 5–21.
- Waldron, J. L., & Veblen, K. K. (2008). The medium is the message: cyberspace, community, and music learning in the Irish traditional music virtual community. *Journal of Music, Technology and Education*, 1(2/3), 99–111.
- Whalen, J., Whalen, M., & Henderson, K. (2002). Improvisational choreography in teleservice work. *The British Journal of Sociology*, 53(2), 239–258.