

1 **Seeing music performance: Visual influences**
2 **on perception and experience**
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5 WILLIAM FORDE THOMPSON, PHIL GRAHAM, and
6 FRANK A. RUSSO
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12 *Abstract*
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14 *Drawing from ethnographic, empirical, and historical / cultural perspec-*
15 *tives, we examine the extent to which visual aspects of music contribute to*
16 *the communication that takes place between performers and their listeners.*
17 *First, we introduce a framework for understanding how media and genres*
18 *shape aural and visual experiences of music. Second, we present case*
19 *studies of two performances, and describe the relation between visual and*
20 *aural aspects of performance. Third, we report empirical evidence that vi-*
21 *sual aspects of performance reliably influence perceptions of musical struc-*
22 *ture (pitch related features) and affective interpretations of music. Finally,*
23 *we trace new and old media trajectories of aural and visual dimensions of*
24 *music, and highlight how our conceptions, perceptions and appreciation of*
25 *music are intertwined with technological innovation and media deployment*
26 *strategies.*
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29 **1. Introduction**
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31 Making music involves not only the communication of musical sounds
32 but is also characterized by a continuously changing and meaningful use
33 of facial expressions, body movements, and hand gestures. Until the late
34 nineteenth century, music performances were almost always experienced
35 as audio-visually integrated activities. Audio and visual components of
36 music performance were separated with the introduction of technologies
37 such as the radio and gramophone, which isolated the aural component
38 of music from all other aspects. That separation has influenced concep-
39 tions of music, such that visual contributions to music activities are often
40 ignored.

41 Facial expressions and gestures affect music experience on several
42 levels. At a basic level, visual information often signals the timing of

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1 musical events, focusing listeners' attention to (or away from) critical
2 acoustic information at specific moments in time. By directing attention
3 in this way, visual cues can increase or decrease musical intelligibility.
4 To draw an analogy, it is well known that seeing the face of a speaker
5 can increase the intelligibility of speech in a noisy environment. Similar
6 effects are observed for musical intelligibility.

7 At a perceptual level, they signal important melodic, harmonic, and
8 rhythmic events. Facial expressions may reflect the additional concentra-
9 tion that is needed to perform notes or passages that are unexpected or
10 tonally unstable. Performers may also intentionally introduce facial ex-
11 pressions and other gestures as a way of sharing with listeners their un-
12 derstanding of the musical significance of such events. Facial expressions
13 and gestures are also used to convey the performer's understanding of
14 segmentation (points of closure), intervallic information (whether a me-
15 lodic interval is large or small), and points of expectancy fulfillment or vio-
16 lation. In this way, visual aspects of performance signal that performers
17 are not merely producers of sound but are themselves listeners, highlight-
18 ing the musical activity as a shared experience between performers and
19 listeners.

20 At the level of affect, music is deeply infused with human emotion and
21 performers use a variety of resources to express and convey that emo-
22 tional content. Emotions are communicated not only in sounded events
23 but also in facial expressions and other bodily gestures (Di Carlo and
24 Guaitella 2004). It has been shown that musically unschooled listeners
25 may rely more heavily on visual than on aural cues when evaluating
26 affective meaning in music (Davidson and Correia 2002).

27 Finally, visual information is highly effective at conveying persona and
28 attitude, at building up what is described from a systemic functionalist
29 perspective as the 'interpersonal' (Halliday 1994) or 'attitudinal' (Lemke
30 1995) dimension of meaning.¹ Facial expressions and hand gestures allow
31 performers to *cozy up* to the audience, emphasizing the music perfor-
32 mance as reciprocal human interaction, whereas an absence of visual
33 information leaves an impression that the performance is a solitary act
34 in which the listener's role is primarily that of a *voyeur*. That is, visual
35 aspects of music personalize the music, drawing performers and listeners
36 closer together in a shared experience.

37 In this paper, we consider ethnographic, empirical, and historical /
38 cultural perspectives in order to examine the extent to which visual and
39 aural aspects of music are integrated in musical experience. We first
40 introduce a framework for understanding how different media (the tech-
41 nological means of distribution), genres (regularized patterns of expres-
42 sion), and modes of transmission (expressive resources such as facial

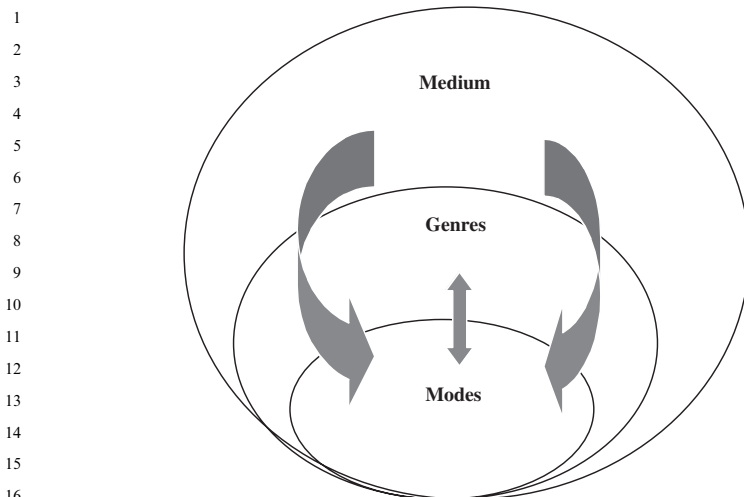
1 expressions, gestures, and melodies) combine to shape our conception and
2 experience of music. We next present case studies of two performances,
3 and describe the relation between visual and aural aspects of perfor-
4 mance. We next report empirical findings that support a thesis of cogni-
5 tively integrated rather than isolated visual and aural faculties. Our data
6 indicate that visual aspects of performance reliably affect perceptions of
7 musical structure (pitch related features) and affective interpretations of
8 music. Finally, we discuss historic and social implications of music per-
9 formance as a mediated or ‘technologized’ event: as artificially separating
10 the aural from the visual in the case of radio and gramophone; or as an
11 embodied, personal experience. By tracing new and old media trajectories
12 of aural and visual dimensions of music, we highlight how conceptions,
13 perceptions, and appreciation of music are intertwined with technological
14 innovation and media deployment strategies. We conclude by arguing
15 that visual aspects of music — hidden as they once were within the medi-
16 ations permitted by radio and gramophone — have more recently become
17 privileged media forms, resulting in the valorization of artists, music, and
18 performance types in a predominantly visual media environment.

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21 **2. Modes, genres, and medium**

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23 Music is sometimes experienced as a live performance but is more often
24 experienced through a variety of media technologies such as radio, televi-
25 sion, film, iPod, or the internet. We first outline a framework for under-
26 standing the role of media and genres in enhancing, editing, or censoring
27 visual and aural aspects of experience. The technological character of
28 the medium means that a filmed music performance provides a different
29 experience from the same performance broadcast on radio. Aural and vi-
30 sual modes of expression are also dependent on the musical genre, with
31 some genres emphasizing visual modes of expression more than others.
32 In short, music experience may be understood with reference to multiple
33 levels of influence, with the technological character of the medium con-
34 straining the kind of genres and modes that can be transmitted, and
35 musical genres differentially highlighting or filtering aural and visual
36 modes of expression.

37 Figure 1 illustrates these levels of influence. A medium is defined as
38 the channel through which communication takes place, whether writing,
39 speech, television, or internet. Genres describe repetitions of patterned
40 interactions within and across cultures. They are typical doings of a com-
41 munity that are repeatable and recognized as the same type from one
42 occurrence to another: a blues performance, baseball game, train ride,



17 Figure 1. *Three levels in which performances may be interpreted and experienced*

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20 writing a check, making a phone call (Lemke 1998). Although a given
21 medium will accommodate a wide range of genres, the technological
22 properties of a medium may be better suited to some genres than others.
23 Each genre, in turn, is constituted by multiple modes, such as tone of
24 voice, words, gestures, and facial expressions. Modes are the resources
25 of expression with which genres are textured, constituted, or formed
(Graham 2003).

26
27 A genre is never independent of technologies or mediation processes,
28 so any account of genre must include an account of its technological as-
29 pects and the modes that constitute a given genre. Media exert their most
30 apparent constraints on the modes they accommodate, selecting filtering
31 or emphasizing them: one can neither show facial expressions through
32 radio nor timbre of voice through text. In film, camera shots and post-
33 production techniques such as automatic dialogue replacement (ADR)
34 draw attention to certain modes at the expense of others. Medium works
35 in a ‘downwards’ way upon genre formations, constraining the range of
36 constituency elements that comprise a given genre by limiting the range
37 of modes by which meanings are made and conveyed.

38
39 **3. A case study of two performances**

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41 We now summarize the use of facial expression, body movement, and
42 gesture in two filmed performances, one by B. B. King and one by Judy

1 Garland. Descriptions are drawn from structured interviews by a trained
 2 musicologist (Jeff Cupchik) of two other musicologists who observed and
 3 commented on the performance by B. B. King (Judges A and B), and
 4 from our observations of the performance by Judy Garland. Our aim
 5 was to identify intentional aesthetic movements and gestures that serve
 6 to highlight, articulate, interpret, and clarify the music; that act to com-
 7 municate emotion or personality; and that otherwise elicit specific inter-
 8 actions between performers and listeners. Whereas certain body move-
 9 ments are required in order to sing or play an instrument, others may
 10 function to encourage listeners to attend to certain dimensions of the
 11 music rather than others, to interpret those dimensions in specific ways,
 12 and to experience the event as a social interaction between performers
 13 and listeners.

14 According to Kurosawa and Davidson (2005), the facial expressions
 15 and gestures used in music performance can be interpreted in view of
 16 the categories of non-verbal behaviour described by Ekman and Friesen
 17 (1981), which include: *emblems*, *illustrators*, *regulators*, and *affect dis-*
 18 *plays*. *Emblems* are body movements with a meaning that is shared by
 19 members of a group, class, or culture, and that can be translated into a
 20 verbal message. They include the thumbs up sign, positioning fingers in
 21 a peace sign, and ‘sticking out’ the tongue. *Illustrators* are used to clarify
 22 or emphasize the content of a message. They include gestures that identify
 23 people or objects (e.g., by pointing), accentuate words or phrases, rep-
 24 resent relations between objects or ideas, or illustrate the timing of an
 25 event. *Regulators* are gestures that maintain the pace and content of
 26 interactions, and include head nods and eye contact. Finally, *affect dis-*
 27 *plays* are expressions that indicate emotional states, such as smiling or
 28 frowning.

29 In the instrumental performance by B. B. King (*Blues Boys Tune*), fa-
 30 cial expressions often function both as *affect displays* and as musical *illus-*
 31 *trators* to emphasize occurrences of dissonance and ‘blue’ notes (Pearce
 32 2003). King frequently adopts an introspective demeanor, with eyes
 33 closed and a pained expression, yet stubbornly shaking his head. This
 34 *affektive display* conveys an impression of stoically reflecting upon but
 35 not surrendering to difficult emotions. Periodically he stares open-eyed at
 36 the audience with an open mouth. The expression appears to convey a
 37 sense of wonder but was also described by one of our judges as an expres-
 38 sion of ‘checking in’ with the audience (i.e., functioning as a *regulator*
 39 in the performer-audience interaction). There are also structural move-
 40 ments that serve as musical illustrators: he suddenly looks up when the
 41 pitch bends upward, or arches his back when there is a prolonged point
 42 of energy (see figure 2).

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21 *Figure 2. B. B. King in performance*

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23 It is notable that B. B. King's facial expressions closely track his guitar
24 sounds and not the accompanying instruments, such as percussion or
25 other guitars. In some cases his rapid head shaking movement mirrors
26 vibrato on individual notes. This gesture has the effect of drawing the
27 listeners' attention to local aspects of music, specifically to B. B. King's
28 nuanced treatment of individual notes, and away from larger-scale mu-
29 sical structure. But his body movements also reflect large-scale structure,
30 becoming generally more pronounced as the performance moves to the
31 point of climax.

32 Judge A observed that King's facial expressions often functioned to
33 signal that certain passages were difficult but satisfying to play. He noted
34 that the expressions closely parallel the call and response structure of
35 blues music, even though the audience in this filmed performance was dis-
36 engaged from any invitation to interact in this way. He also suggested
37 that King's open-mouth expression conveys a sense of letting the sound
38 go free.

39
40 It looks like he's working on every detail when he's got his mouth closed. When
41 he opens his mouth it has to do with letting the sound sing. It's as though he's
42 saying 'What do you think about this?' His face conveys the chronological process

1 of getting a musical idea and realizing it in sound. When he's got the corner of his
2 mouth lifted he's *thinking* of an idea; when he is wincing he's doing the *technical*
3 work. And when he's satisfied with it and wants the audience to respond, he opens
4 his mouth and leans forward. People react when he leans forward and opens his
5 mouth and eyes wide, because they know he's asking for a reaction.

6 Judge B pointed out that King's movements help him to get into the feel
7 of the music.
8

9 I don't know where it comes from, but as a guitarist you just do it. Jimi Hendrix,
10 Eric Clapton, all these guys, they bend notes and they lean back. It's a physical
11 thing. Like you get leverage. It feels like you get leverage when you do that.
12

13 Judy Garland is well known as a vocalist for having developed a highly
14 stylized and complex visual style that functions on many levels. In the
15 performance examined (*Just in time*), gestures and facial expressions are
16 closely tied to the narrative of the lyric, frequently functioning as *illustra-*
17 *tors* of verbal content (Jewison 1962). For example, the word 'tossed' is
18 accompanied by a 'tossing' gesture. At a point where the lyric conveys a
19 negative emotion ('I was lost'), hand gestures simulate 'swimming' mo-
20 tions, completing the telling image of being lost at sea. At the same time,
21 her warm smile provides an *affect display* that anticipates the happy reso-
22 lution still to come ('now you're here'). By snapping fingers on the lyrics
23 'for love came just in time' she provides a rhythmic *illustrator* of the ver-
24 bal content, as if the beat is a metaphor for love arriving 'just in time.'
25 Near the end of the performance a winning fist thrust into the air is
26 *emblematic* of the successful resolution to the story narrative, 'That
27 lucky day.'

28 In addition, facial expressions and gestures also reflect elements of the
29 music that cannot be predicted just from the lyrics. As an example, at
30 a point of tonal modulation, Garland walks boldly forward to illustrate
31 the significance of this musical change. Hand gestures often also mirror
32 pitch height, as when a low note and the lyric 'low' are accompanied by
33 an outstretched arm with her hand at a low spatial position. An upward
34 hand movement also mirrors the rising pitch in the melodic line that ac-
35 companies the desperate words 'nowhere to go' (see Figure 3).

36 It is of technological significance, specifically cinematic in character,
37 that in Judy Garland's live 1962 performance the camera focuses on
38 her whole body, suggesting that she is a total performer. In contrast,
39 perhaps in the wake of MTV, more contemporary and highly edited cine-
40 matography works montage-like with extreme close-up and fast-cuts to
41 'dismember' bodies, lingering on isolated body parts (Kilbourne 1999).
42 Such techniques impact on the role of the visual in the delivery of music

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21 *Figure 3. Judy Garland in performance*

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23 performance, permitting in the former case Garland's whole-of-person
24 narrative, and in other cases providing visual enhancements to a perfor-
25 mance perhaps in order to compensate for or distract from its lack of
26 musicality.

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29 **4. Psychological implications**

30
31 In this section we explore empirical research on visual aspects of music
32 performance. Our aim in conducting empirical research was to determine
33 whether visual aspects of performance actually influence perceptual and
34 aesthetic judgements of music, or whether they are interpreted as playing
35 merely a subsidiary or non-essential role. Psychological research on music
36 performance has grown enormously in the past two decades, although
37 very few researchers have examined the perceptual consequences of visual
38 aspects of music performance. After reviewing research on music per-
39 formance, Gabrielsson concluded that there is a 'need for investigating
40 the role that visual information may play in music perception' (Gabriel-
41 son 1999: 523). He emphasized that the conceptualization of music as a
42 purely acoustic phenomenon is not typical of all cultures or all times.

1 Rather, music making is historically and typically experienced as bodily-
2 mediated phenomena, as events in which people interact with each other
3 *in person*.

4 A small number of researchers have pointed to the importance of visual
5 aspects of performance. Juslin (2001) noted that highly emotional facial
6 expressions often accompany music performances. Davidson (1993, 1994,
7 1995, 2001; Davidson and Correia 2002) provided detailed analyses of
8 visual aspects of performances and reported that listeners are often in-
9 fluenced by such accompanying information. Clayton (forthcoming) de-
10 scribed ethnographic research suggesting that gesture, motion, and facial
11 expression can convey a performer's interpretation of music. Finally,
12 Vines, Nuzzo and Levitin (in press) observed that the body movements
13 of a performer mirror important structural elements in music.

14 Nonetheless, most psychological research on performance has ignored
15 non-acoustic aspects of performance, considering them as extraneous and
16 not essential to the music. Indeed, visual information related to music
17 performance is often trivialized on the grounds that it is 'determined by
18 the sound ... in order to produce a given chord, you have to place your
19 fingers on given frets ...' (Cook 1998: 263). When visual influences on
20 judgments of music are noted, they are often discussed as examples of
21 visual 'bias' (McPherson and Thompson 1998; Thompson et al. 1998).
22 For example, studies of performance adjudication indicate that skin color
23 and gender influence performance assessments. For this reason orchestras
24 and professional ensembles often have 'blind' auditions as the first stage
25 for selecting members. Although bias effects are clearly not desirable,
26 visual aspects of music performance can have aesthetic and perceptual
27 consequences that positively contribute to and enhance the musical expe-
28 rience. In particular, facial expressions and bodily movements that occur
29 during a music performance may greatly add to our experience of that
30 music.

31 The ability to integrate information from different modalities in order
32 to make sense of the world is well documented (Marks 1978; McGurk
33 and MacDonald 1976). For example, visual information associated with
34 speaking (i.e., facial movements) has surprisingly strong effects on speech
35 perception. The McGurk effect (McGurk and MacDonald 1976) illus-
36 trates that visual articulatory information has striking effects on syllable
37 perception. In some cases visual signals determine the syllable perceived;
38 in other cases, acoustic and visual signals combine to produce a new per-
39 ceived syllable. For example, if an acoustic signal created by uttering
40 the syllable 'ba' is paired with facial movements associated with the sylla-
41 ble 'ga,' most people hear the 'compromise' syllable 'da.' If an acoustic
42 signal for the syllable 'ba' is paired with facial movements associated

1 with the syllable ‘va,’ most people hear the syllable ‘va,’ with the visual
2 information overriding the acoustic signal. Thus, visual information is
3 closely integrated with acoustic information in speech perception. At the
4 syllabic level, perception is influenced by the relative strengths of acoustic
5 and visual information, and whether or not a sensible compromise can be
6 achieved. Integration occurs even when people are told of the dubbing
7 procedure, suggesting that the process is automatic and unconscious.
8 Again, these data foreground the potential difficulty associated with con-
9 fining research in music to ‘acoustic-only’ information. They also fore-
10 ground the strong influence that audio technologies have had in the last
11 century on psychological research into music.

12 Theoretical discussions of connections between visual and musical in-
13 formation are not new. Dissanayake argues that music actually evolved
14 in humans as ‘multimedially presented and multimodally processed ac-
15 tivity of temporally and spatially patterned vocal, bodily, and facial
16 movements’ (Dissanayake 2001: 389). Cook (1998) provides a theoretical
17 discussion of multimodal music performance, such as ballet, opera, and
18 MTV clips. Empirical studies of multimedia suggest that visual and
19 musical information combine to form an integrated impression of an
20 event. Such effects are well documented in studies of music for film and
21 television (Cohen 2001; Gorbman 1987; Thompson 2002; Thompson et
22 al. 1994). However, the latter studies concern the effects of music (under-
23 scoring) on judgments of film (primarily the visual component) rather
24 than the reverse: the effects of visual information on judgments of music
25 — an important distinction in the present discussion. Moreover, research
26 on film music usually concerns the effects of combining music with visual
27 images that do not correspond to bodily performances of that music.
28 Soundtracks function as emotional or dramatic wallpaper for the visually
29 dominated narrative.

30 However, few psychological researchers have identified ‘musical
31 McGurk effects’ in which visual aspects of a music performance influence
32 perceptions of musical structure itself. Saldaña and Rosenblum (1993)
33 have identified the effects of visual information on the perception of
34 plucked versus bowed sounds from string players. That is, given an
35 audio-visual presentation of a performed note, a note may be ‘heard’ as
36 starting somewhat more abruptly if the visual information suggests a
37 plucked action than if it suggests a bowed action. The complex and highly
38 expressive visual information conveyed through facial expressions and
39 body movements in music performance suggests a wide range of potential
40 effects that still need to be examined in depth. In the following section,
41 we describe five laboratory experiments designed to contribute to such a
42 research agenda.

1 The experiments described below were designed to identify visual influ-
2 ences on two types of musical judgments. In three experiments we as-
3 sessed visual influences on structural interpretations of music and in two
4 experiments we assessed visual influences on emotional interpretations
5 of music. In each experiment, we presented listeners with video-clips of
6 excerpts from performances by skilled musicians, either created by us or
7 taken from archival sources. For each experiment we confirmed the reli-
8 ability of our results using analysis of variance and an alpha level of 0.05.

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11 4.1. *Effects of facial expression on the perception of music structure*

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13 Musical dissonance occurs when a pitch or pitch combination does not
14 fit with the overall harmonic or tonal context of a piece of music; conso-
15 nance is to some degree a function of genre and refers to a note or notes
16 fulfilling the expectations of harmonic and tonal context.² Sensitivity to
17 relations between different notes, also called *relative pitch*, is at the foun-
18 dation of our perception of melodic structure. Two sequential notes may
19 be perceived as very different, forming a large melodic interval, or similar,
20 forming a small interval. Certain pitch relations have special significance
21 in music, such as those associated with third, fifth, and octave notes in a
22 scale.

23 Facial expressions and gestures during performance may influence per-
24 ceptions of consonance or pitch because they reflect the physical effort
25 required to perform a musical interval, as well as the performer's interpre-
26 tation of pitch structure. Greater concentration is required when per-
27 forming a pitch that is tonally dissonant such as the flat fifth than when
28 performing a consonant interval such as the perfect fifth. For musicians
29 trained in Western music, this effort arises because dissonant pitches oc-
30 cur rarely in Western music and are therefore unstable in memory. Facial
31 expressions may also reflect the performer's perception and appreciation
32 of consonance and dissonance in music, illustrating the emotional impact
33 that such consonance and dissonance has on the performer. Singers also
34 require greater concentration when singing a large rather than a small
35 melodic interval because performing such a large interval involves a large
36 change in muscular position and is associated with a greater potential for
37 pitch errors.

38 Performers may even dramatize the physical effort involved in order
39 to manipulate perceptions of the music by the audience. Emphasizing the
40 dissonant quality of a pitch may serve as an illustrator, encouraging lis-
41 teners to appreciate the aesthetic use of dissonance in music, as well as
42 a regulator, confirming for listeners that the use of such dissonance was

1 intended. Exaggerating the apparent effort involved in producing a me-
2 lodic interval may expand the perceived size of that melodic interval,
3 whereas underplaying the perceived effort may contract the perceived
4 size of that melodic interval. This effect may be observed with musically
5 trained listeners who can assign a categorical label to intervals. For exam-
6 ple, judgments of the size of a melodic interval are significantly influenced
7 by differences in timbre (or ‘tonal texture’) between the two tones, even
8 for musically trained listeners who possess categorical labels for intervals
9 (Russo and Thompson, in press). That is, even though participants had
10 explicit, formal knowledge of pitch-interval category concepts and labels,
11 their subjective experience of these intervals was not determined by that
12 knowledge.

13 In Experiment 1, we examined the role of facial expressions in shaping
14 perceptions of musical dissonance. Twenty excerpts were selected from
15 audio-visually recorded performances of B. B. King playing the blues. In
16 ten of the selections B. B. King conveyed a strong sense of dissonance
17 in his facial expression (as exemplified in Figure 4). In the remaining
18 ten selections, his facial expression was more neutral. The level of disso-
19 nance conveyed by the sonic element of the music did not constrain our
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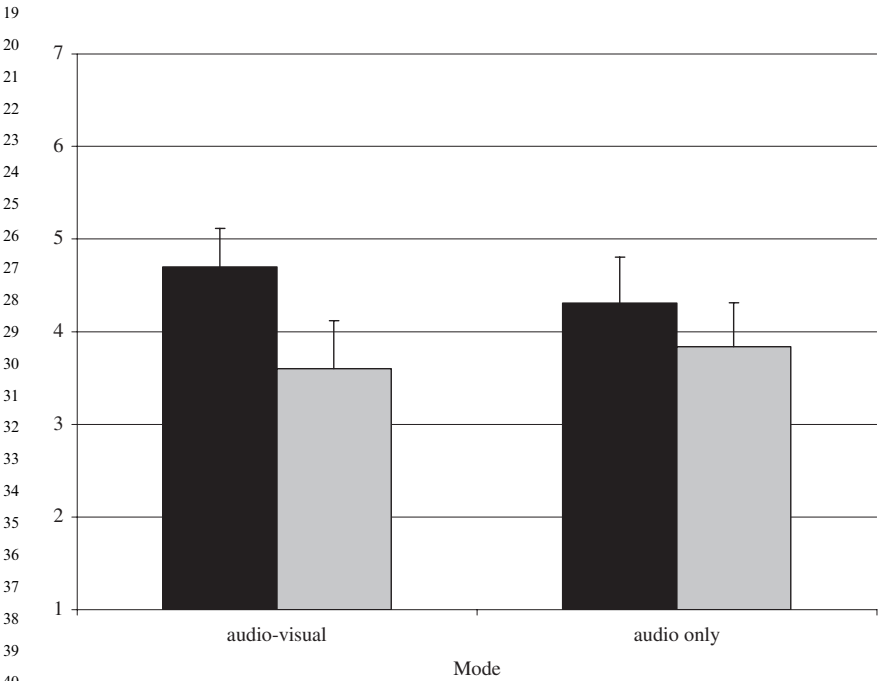


41
42 Figure 4. *An example of B. B. King conveying dissonance through the visual mode*

1 selection of excerpts. Two groups of participants were presented with the
 2 20 excerpts. One group received audio-only presentation and the other
 3 group received audio-visual presentation. We expected that the disso-
 4 nance conveyed by the visual affect would only influence ratings of disso-
 5 nance in the audio-visual presentation mode.

6 Twenty-six participants with limited formal training in music were
 7 asked to judge the level of dissonance in musical excerpts. All clips were
 8 selected to be within 3 to 6 seconds in length. The performer's facial ex-
 9 pression could be described as conveying dissonance for 10 of the excerpts
 10 and neutral for the remaining 10 excerpts. A sense of visual dissonance
 11 was generally conveyed by wincing of the eyes, shaking of the upper
 12 body, and a rolling of the head in a back-swung position. Dissonance
 13 was described to participants as occurring when the music sounded dis-
 14 cordant (i.e., conflicted or negative) and in need of some sort of resolu-
 15 tion. Ratings were made on a 7-point scale, where 1 represented 'low dis-
 16 sonance' and 7 represented 'high dissonance.'

17 Figure 5 plots dissonance ratings for excerpts accompanied by either
 18 facial expressions of dissonance or neutral expressions. Statistical analyses
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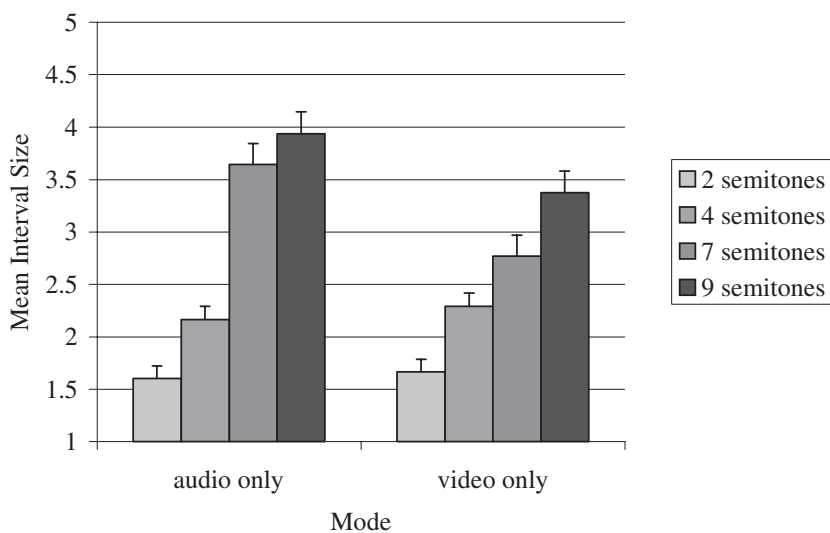


41 Figure 5. Mean dissonance ratings (and standard error bars) for intervals presented in audio
 42 and audio-visual presentation modes

1 indicated a reliable interaction: in the audio-visual presentation mode,
 2 but not in the audio-only presentation mode, ratings were considerably
 3 higher for performances that were visually dissonant than for perform-
 4 ances that were visually neutral (Thompson and Russo [forthcoming]).

5 In Experiment 2, we examined whether or not a performer was capable
 6 of conveying the size of a melodic interval through facial expressions
 7 alone. In this experiment, we utilized recordings of intervals performed
 8 by a trained singer. Twenty-four participants with limited music training
 9 were recruited: one group ($n = 12$) received audio-only presentation; the
 10 other group ($n = 12$) received video-only presentation. Participants were
 11 asked to make judgments of interval size. The performed intervals ranged
 12 in size from two to nine semitones. The performer's facial expression and
 13 physical gestures served as illustrators, emphasizing the physical effort
 14 and dramatic significance associated with a large melodic interval. We ex-
 15 pected this visual information to influence the listeners' perception of the
 16 size of the melodic interval. The size rating was made on a 5-point scale
 17 in which a rating of 1 indicated a small interval and a rating of 5 indi-
 18 cated a large interval.

19 Figure 6 plots mean size ratings for audio-only and video-only condi-
 20 tions and indicates that listeners were highly sensitive to interval size



41 Figure 6. *Mean size ratings (and standard error bars) for intervals presented in audio-only*
 42 *and video-only conditions*

1 cues conveyed by visual information. In particular, the veridical ordering
2 of interval size was preserved in the absence of any acoustic information.

3 In Experiment 3, we examined whether visual aspects of music perfor-
4 mance influence the perception of interval size when the aural dimension
5 of music is available. Fifteen new participants with limited musical train-
6 ing judged the size of melodic intervals that were either congruent or in-
7 congruent with accompanying facial expressions. The audio and video
8 channels of the recordings described in Experiment 2 were recombined
9 to form congruent and incongruent audio-visual presentations. Con-
10 gruent presentations consisted of audio and visual aspects of the same
11 interval. Incongruent presentations consisted of audio and visual aspects
12 of different intervals. Participants were asked to base their ratings on
13 the audio component alone, and rated interval size using a 5-point scale
14 (1 = small; 5 = large).

15 As predicted, visual aspects of the sung intervals reliably influenced
16 judgements of interval size. Ratings for audio presentations of a 2-
17 semitone interval were higher when accompanied by the incongruent
18 video (9-semitone interval) than when accompanied by the congruent
19 video. Conversely, ratings for the audio presentation of a 9-semitone
20 interval were lower when accompanied by the incongruent video (2-
21 semitone interval) than when accompanied by the congruent video.

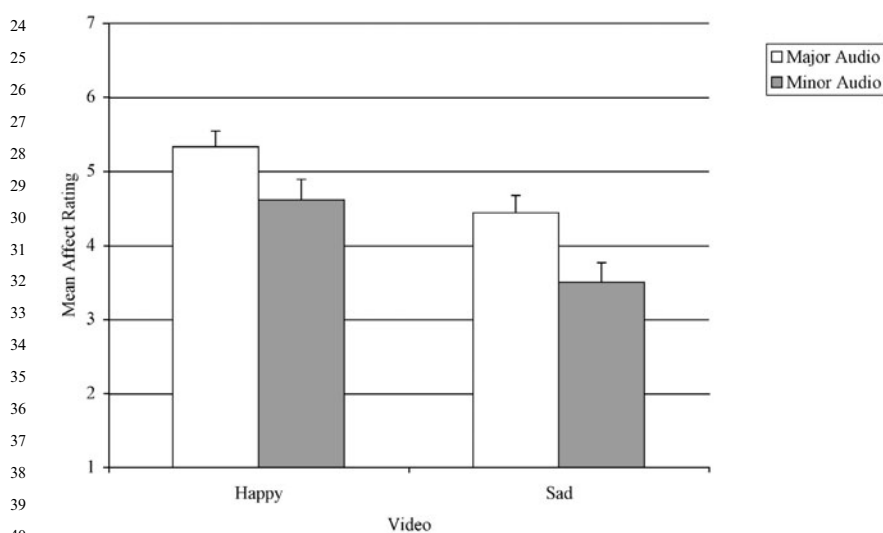
22 23 24 4.2. *Effects of visual information on judgements of affect in music*

25
26 All listeners are highly sensitive to emotional meaning in music and per-
27 formers use a variety of techniques to express such meaning (Balkwill and
28 Thompson 1999; Balkwill, Thompson and Matsunaga 2004; Juslin and
29 Laukka 2003; Sloboda and Juslin 2001; Thompson et al. 2003, 2004).
30 Qualities of music such as tempo, loudness, consonance, mode, and
31 melodic contour provide basic acoustic signals of emotion that can be
32 understood by listeners from an early age (Juslin and Laukka 2003).
33 Emotional meaning can even be understood in unfamiliar music from
34 other cultures (Balkwill and Thompson 1999; Balkwill et al. 2004) and
35 many acoustic cues observed in music are also observed in speech
36 (Balkwill and Thompson n.d.; Ilie and Thompson, in press; Juslin and
37 Laukka 2003; Thompson et al. 2004). In a music performance, emotions
38 are conveyed not only in the sounded events but also in facial expressions
39 and gestures.

40 In Experiment 4, we presented listeners with video recordings of sung
41 melodic intervals and asked them to judge the affective valence of those
42 intervals. The interval was either a major third, which should convey a

1 positive emotional message, or a minor third, which should convey a
 2 negative emotional message. Two judges independently documented the
 3 visual cues (i.e., affect display) available in each performance. Major in-
 4 tervals were performed with raised eyebrows, widening of the eyes, and
 5 a slight smile (lips come together); minor intervals were performed with
 6 little movement in the eyes, eyebrows, or mouth. In order to isolate the
 7 influence of facial expressions, audio-visual presentations were either con-
 8 gruent or incongruent. In a congruent presentation, the intended emotion
 9 in both modes was identical (e.g., positive valence). In an incongruent
 10 presentation, the intended emotion in both modes was different (e.g.,
 11 happy audio with sad video).

12 Twenty-three participants with a wide range of music backgrounds
 13 were presented with audio-visual recordings of the sung intervals and
 14 were asked to rate the affect being conveyed in each performance on a
 15 five-point scale. A rating near 1 indicated that the interval conveyed a
 16 negative emotional message, and a rating near 5 indicated that the inter-
 17 val conveyed a positive emotional message. As with Experiment 3, partic-
 18 ipants were told to base their judgments on the audio component alone.
 19 Mean affect ratings for all presentations of major and minor third inter-
 20 vals are plotted in Figure 7. For both the major and minor third sung
 21 intervals, mean ratings were higher (more positive) if the interval was



41 Figure 7. Mean affect ratings (and standard error bars) for major and minor intervals
 42 (audio) with happy and sad facial expressions

1 accompanied by facial expressions used to sing a major (happy) interval
2 than if the interval was accompanied by facial expressions used to sing a
3 minor (sad) interval.

4 In Experiment 5, we investigated the influence of visual aspects of per-
5 formance on perceived emotional *valence* (i.e., positive or negative) in
6 filmed vocal performances. We selected 30 short clips (roughly 10 second
7 each) from a number of filmed performances by Judy Garland (Jewison
8 1962, see Figure 8). Clips were selected so as to be representative of her
9 performance style and included emblems, illustrators, regulators, and
10 affect displays. Recognizing that aural and visual aspects of music typi-
11 cally communicate the same affective valence, our aim was to deter-
12 mine how often (if ever) accompanying visual information actually has
13 a significant impact on listeners' affective interpretation of the music.
14 Two groups of participants were recruited: One group of participants
15 received audio-only presentation; the other group received audio-visual
16 presentation.

17 Thirty-nine participants with limited musical training were asked to rate
18 the emotional valence of the music on a scale from 1 (highly negative) to
19



41 Figure 8. An example of Judy Garland conveying emotional valence through hand gesture
42 and facial expression

1 7 (highly positive). Participants were told to consider only the ‘music’
2 when assigning their ratings.

3 Data analysis revealed that in six performances there was a significant
4 difference between valence ratings for the audio and audio-visual presen-
5 tation modes. (The number of differences expected by chance is between
6 1 and 2.) The results indicate that the emotional connotation of a music
7 performance that is both seen and heard is not always the same as the
8 emotional connotation of a performance that is merely heard. Valence
9 ratings were higher for audio presentation mode than for audio-visual
10 presentation mode in five of these performances but the trend was re-
11 versed in the remaining performance. These findings confirm that visual
12 aspects of performance sometimes alter the perceived valence of the music
13 and that the direction of influence depends on the performance.

14 The five experiments confirm that visual aspects of performance reli-
15 ably influence perceptions and interpretations of music. To a surprising
16 extent, facial expression and other bodily movements affect music experi-
17 ence at a perceptual level and an emotional level. Different facial expres-
18 sions can cause the same musical events to sound more or less dissonant,
19 the same melodic interval to sound larger or smaller, and the same music
20 to sound more or less joyful. In short, listeners integrate visual with aural
21 aspects of performance to form an integrated audio-visual mental repre-
22 sentation of music, and this representation is not entirely predictable
23 from the aural input alone.

24

25

26 **5. Visual aspects of music in contemporary media**

27

28 The empirical evidence described above confirms that visual aspects of
29 music significantly influence our experience of music, and yet music is
30 often conceived as a purely aural experience. This view is implicit, for
31 example, in music pedagogy and theory. We now discuss factors that
32 may have contributed to this pervasive assumption and identify recent
33 genres and media forms that are allowing visual components of music
34 to reemerge as an important aspect of music experience.

35 A significant historic event in the current context is the invention of the
36 radio and gramophone, which isolated the audio mode of music, reinforc-
37 ing the notion that music experience was a solely aural phenomenon. At
38 the same time, the visual system was isolated with silent movies, which
39 were entirely visual experiences. The first film was itself an experiment to
40 see whether all four hooves of a galloping horse are off the ground at the
41 same time, so the interest was exclusively visual. Whether by accident,
42 technological underdevelopment, or the general historical tendency in

1 communications since the printing press, at this point in history there is a
2 purely technological splitting of visual and aural technologies. Eventu-
3 ally, piano or orchestra started to accompany silent films, but this ac-
4 companiment functioned originally to mask the distracting sound of the
5 projection machine. Musical accompaniment only had to vaguely match
6 the visual content and was often improvised.

7 For the generations that experienced music primarily through radio or
8 some other electronic listening apparatus, music experience seems, quite
9 naturally, to be an aural experience. Indeed, the vast majority of music
10 listening continues to be an aural experience through radio listening while
11 driving, or through the more recent contraptions such as personal listen-
12 ing devices (e.g., iPods). Nonetheless, when commercial usage of the
13 radio first started to include the broadcasting of music, the reactions of
14 musicians varied from outrage to acclaim. In 1926, Scholes argued that
15 the broadcast medium of radio 'led to the greater *democratization* of
16 music.' He also described a number of 'minor advantages,' including:

17
18 a diminution of *personality* worship. When you no longer see the pianist throwing
19 his arms about, when you no longer see the tenor or baritone rising on his toes to
20 his top note, then let us hope that people will begin to listen to music as music and
21 not as something which is coming to them from a celebrity ... (Scholes 1926: 17)

22
23 However, according to the same author, broadcasting also has disad-
24 vantages, leading to 'less reading and thinking' and a 'discouragement
25 of home performances' (Scholes 1926: 18–19). Scholes also noted that
26 when you do not see the actual performer, you somehow 'do not enjoy
27 the playing so much' (Scholes 1926: 18). According to Scholes, the most
28 serious problem with radio is that it creates '... a demand for more
29 *popular* kinds of music, and there may come discouragement to serious
30 composers,' with an inevitably 'cheapening influence' (Scholes 1926: 19).
31 Such outrages continued through to the audio-visual era. Bands like *Milli*
32 *Vanilli* have been embarrassed on world broadcast when they were dis-
33 covered lip-synching after a playback machine broke down during their
34 performance.

35 Paradoxically, popular artists today must, above all else, look the part,
36 and the ratio of visual to overall musical content can be seen to have
37 produced an aesthetic economy that threatens to privilege visual over au-
38 ral aspects of music. This may lead to a stifling of musical forms while
39 promoting a proliferation of visual 'styles' (cf. Fairclough 2000). The
40 emphasis on the visual has led to a number of challenges for musicians:
41 the diminution of music as an *art form* due to the *formulaic* (i.e., generic)
42 demands of visually oriented film and video productions; the emphasis on

1 the visual appeal of performers over their talent; and distribution models
2 that exclude many excellent musicians from participating in the so-called
3 *music industry*, to the point at which only 1200 musicians in a country the
4 size of Germany can make a living from music.

5 The general diffusion of the video clip as a genre for music promotion
6 in the early 1970s entailed an interesting reversal of the usual mediations
7 developed by the powerful film monopolies. Rather than starting with
8 visual information and accompanying it with music, music videos *started*
9 with music production and visual materials were developed to fit the
10 music. In narrative film and video production, the mediation chains work
11 in the opposite direction.

12 Nonetheless, in spite of visuals being the apparent accompaniment in
13 music videos, the evolution of MTV has shown a gradual reestablishment
14 of visual domination in the economy of musical sensitivities. In early
15 music clips, the performing band was featured heavily, emphasizing the
16 performance and production of the music. Almost immediately, however,
17 producers recognized the need for music stars to be physically interesting,
18 if not conventionally attractive in appearance. The appearance or look
19 of earlier performers such as Hendrix, Joplin, and other such rebel types
20 had a look that made as much a statement of rebellion as their music. As
21 videos evolved, the aesthetic field of visual information expanded, be-
22 coming more intricate, complex, expensive, and dominant. In most music
23 videos today, the aesthetic field of visual information is far more expan-
24 sive and expensive than that of the music. The listener's attention is
25 focused on visual details; their attention to the music is less focused and
26 they are left with only sketchy and generic impressions.

27 The increased use of visual resources in new media has altered the
28 alignment or co-regulation of perception and affect that occurs between
29 performers and listeners. If part of the performer's interpretation of a
30 piece of music is conveyed through the visual modality and if the visual
31 modality can influence an audience's interpretation of that music, then
32 substituting the gestures of a performer with other visual content neces-
33 sarily changes perceptual and affective co-regulation, distorting and dilut-
34 ing the communication between performers and listeners through a literal
35 distancing of the performer from her or his audience. Moreover, contem-
36 porary strategies for music deployment combine input from multiple
37 participants. The modern music video, for example, not only reflects
38 the interpretation of the performing artist but that of the stylist, director,
39 producer, and other participants in production and post-production. The
40 result is a new form of musical interaction, with participants displaced
41 in space and time. Musical interaction is distributed among performers,
42 producers, and listeners who participate in different times, places and

1 contexts. The process is filtered and distorted by media that deploy only
2 the aural component, or that overlay new, often irrelevant or distracting
3 visual information onto the aural experience.

4 The increased use of visual resources in music performance also has
5 political economic implications. Because the visual dimension has been
6 'reintroduced' to music through new technologies, and because of the per-
7 vasive and influential use of visual technologies in music clips and live
8 technologies, it can be argued that the visual aspects of music perfor-
9 mance have become more influential than at any other time in history,
10 precisely through their technological separation and reintegration. Mas-
11 sive lighting and public address systems; expensive video production and
12 recording techniques; the proliferation of MTV-type programs to pro-
13 mote musical performers and performances; and the tightly controlled
14 global distribution networks through which these performances are dis-
15 seminated present enormous barriers to entry for young and emerging
16 musicians in the global music economy.

17 Visual values have increasingly come to dominate the political econ-
18 omy of sensory appeal. Today, this has resulted in a proliferation of
19 visual 'styles,' or generic 'ways of being' (Fairclough 2000) that are pro-
20 duced for popular music clips. Examples of how this has played out
21 include lip-synched performances, and more recently in the 'air guitar'
22 phenomenon, in which undue attention is drawn to the clichéd, generic
23 gestures and exaggerated movements of lead guitarists. National air gui-
24 tar competitions are now held in many countries throughout the world,
25 and every year an international competition is held. Air guitar experts
26 pay close attention to every gesture and movement of guitarists, down to
27 individual hand gestures. The judgments are generic; that is, they are re-
28 sponsive to the regularized patterns or genres of what real guitar players
29 do. The air guitar phenomenon suggests that visual-stylistic aspects of
30 performance are valued in their own right, and may therefore influence
31 judgements of what distinguishes good music from bad.³ The look, the
32 poses that convey attitude, the hand gestures, and the frenetic movements
33 are all emblematic of what these fans have come to value in their musical
34 experiences.

35 Thus, visual aspects of music remain critical in live performance, but
36 the facial expressions, hand gestures, and other movements of performers
37 are gradually being diluted or even replaced by other kinds of visual in-
38 formation that are presented in popular music experiences. This move-
39 ment away from the actions of the performer began with the super
40 stadium concerts of the early 1970s, the most obvious exemplar being
41 Pink Floyd, with its high ratio of visual machinery to actual people per-
42 forming music. Mesmerizing lights shows, visual tricks and surprises, and

1 elaborate sets became markers of prestige in themselves. Music videos
 2 have continued this trend away from the performance itself, with pro-
 3 ducers preferring fragmentary sequences of startling images, an emphasis
 4 on fantasy and liminal states, and a disruption of traditional narrative.
 5 This visual information, as with facial expressions and gestures of per-
 6 formers makes reference to the music and can be interpreted on a semi-
 7 otic level. But unlike the nonverbal behavior of live musical performers
 8 (e.g., emblems, illustrators, affect displays, and regulators), video images
 9 can be detached from the aural experience. Rather than consistently sup-
 10 porting the music, these video images may compete for our attention. In
 11 this way, performance in music videos — in spite of their innovative use
 12 of both audio and visual materials — may reinforce the separation of
 13 audio and visual dimensions of music that was begun with the invention
 14 of the radio, gramophone, and silent movie.

17 Notes

- 19 1. Halliday (1994) provides a metafunctional distinction between different dimensions of
 20 meaning: 'Ideational' meaning ('of'-ness or 'about'-ness of an utterance), 'Interpersonal'
 21 meaning (how a meaningful event reflects, changes, or reinforces social relationships),
 22 and 'Textual' meaning (how an utterance is textured at multiple levels to provide coher-
 23 ence). These aspects are seen to be part of any and all utterances and happen at the same
 24 time. Similarly, Lemke (1995) provides a metafunctional distinction between 'Presenta-
 25 tional' meaning (the way elements and aspects of the world are typically represented
 26 by a particular community), 'Orientational' or 'Attitudinal' meaning (the attitudes ex-
 27 pressed towards these elements and aspects in a given utterance), and 'Organisational'
 28 meaning (how coherence is derived through internal and external connections between
 29 text and context).
- 30 2. An example of dissonance was illustrated by Chuck Jones who, in one Warner Brothers
 31 cartoon, had Bugs Bunny play 'If all those Endearing Young Charms' with the final
 32 note flattened by one semitone. The correct note had been rigged inside the piano by
 33 Yosemite Sam to ignite some TNT upon being played. The repeated dissonance of the
 34 flat note eventually aggravates Yosemite Sam to the point at which he is compelled to
 35 play the right note, thus blowing himself up.
- 36 3. This phenomenon was evident in popular music appreciation when the artist Christo-
 37 pher Cross became an overnight radio hit, unexpectedly selling millions of albums. His
 38 company rushed to make a music video, but unfortunately Cross was not photogenic.
 39 His record sales stopped and he was never heard of again.

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- William Forde Thompson (b. 1957) is the Director of the Institute for Communication
and Culture at the University of Toronto at Mississauga <b.thompson@utoronto.ca>. His

1 interests include music, gesture, and cognition. His recent publications include 'Decoding
2 speech prosody: Do music lessons help?' (with E. G. Schellenberg and G. Husain, 2004);
3 'Recognition of emotion in Japanese, Western, and Hindustani music by Japanese listeners'
4 (with L. L. Balkwill and R. M. Matsunaga, 2004); and 'The attribution of meaning and
5 emotion to song lyrics' (with F. A. Russo, in press).

6 Phil Graham (b. 1961) is Canada Research Chair in Communication at the University
7 of Waterloo and Senior Lecturer in Communication at the University of Queensland
8 <pwgraham@uwaterloo.ca>. His research interest is in the political economy of communica-
9 tion. His recent publications include 'Militarising the Body Politic: New media as weapons
10 of mass instruction' (with A. Luke, 2003); 'Predication, propagation, and mediation: SFL,
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13 discourse-historical analysis of George W. Bush's declaration of war on terror' (with T.
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14 Frank A. Russo (b. 1969) is a Post-Doctoral Research Fellow at the University of Toronto
15 at Mississauga <frusso@utm.utoronto.ca>. His interests are in affective and aesthetic aspects
16 of human communication. His recent publications include 'Learning the "Special Note":
17 Evidence for a critical period for absolute pitch acquisition' (with D. L. Windell and Lola
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