

Prof Ian Cross

Professor of Music & Science University of Cambridge

Biography:

Ian Cross is Professor of Music & Science and is a Fellow of Wolfson College, Cambridge. He is Director of the Music Faculty's Centre for Music and Science (CMS), contributes to the University's M.Phil in Film and Screen Studies, and to the courses arranged by the Social Sciences Research Methods Centre.

Publications include the books *Musical Structure and Cognition* (Academic Press, 1985) and *Representing Musical Structure* (Academic Press, 1991), both co-edited with Peter Howell and Robert West, the *Oxford Handbook of Music Psychology* (OUP, 2009; 2nd edition, 2016), co-edited with Susan Hallam and Michael Thaut, and *Language and Music as Cognitive Systems* (OUP, 2012), co-edited with Patrick Rebuschat, Martin Rorhmeier and John Hawkins.

He is a member of the Committee and a Trustee of the Society for Education, Music and Psychology Research (SEMPRE), and is a Governor, and Chair of the Research Committee, of the Music Therapy Charity. He is Editor-in-Chief of SAGE's new online Open Access journal with SEMPRE, *Music & Science*, and is on the editorial advisory boards of numerous journals including *Psychology of Music*, *Music Perception*, and *AI & Society*; from 1997 until 2000 he was the Associate Editor (English language) of ESCOM's journal *Musicae Scientiae*. Along with Professors Graham Welch and Adam Ockelford, he is Series Editor of Routledge's SEMPRE *Studies in the Psychology of Music*. He is also a guitarist, having studied with Tim Walker and holding diplomas from the Royal College of Music and the Royal Academy of Music.

For more information (including graduate student supervision) see Ian Cross's page on the CMS website.

Subject groups/Research projects

Music, Science, Technology:

(Music Cognition)*

Ethnomusicology, Popular Music and Sound Studies:

(Biocultural Approaches)*

Colleges, Departments and Institutes

Wolfson College:

Professorial Fellow

Research Interests

Ian has undertaken wide-ranging research into many different aspects of music: experiments in music cognition have explored the nature of our experience of tonal and rhythmic structures, as well as the mechanisms that shape those experiences; a Leverhulme Trust-funded project with Professors Jim

Woodhouse and Brian Moore (in the Departments of Engineering and Psychology, respectively) studied the perceptual correlates of violin acoustics; and projects in experimental archaeology have investigated the sound-producing potential of lithic artefacts and the possibility of their identification in the archaeological record. He has also written extensively on the relationships between music and processes of evolution (see OUP blog).

He has two main ongoing research projects, both exploring the dynamics and effects of music as an interactive medium. The first focuses on the cognitive processes underlying spontaneous interaction in speech and music, with Sarah Hawkins, Cambridge, and Richard Ogden, University of York: for a recent paper with Juan Pablo Robledo, detailing some results, see http://www.isca-speech.org/archive/SpeechProsody_2016/pdfs/380.pdf. The project is being further developed to incorporate motion-capture data, in collaboration with Carlos Cornejo and his group in the Pontificia Universidad Católica de Chile, Santiago.

The second project involves a full set of randomised controlled trials to explore potential relationships between musical group interaction and the development of the capacity for empathy and prosocial behaviour in children, following up the results of Rabinowitch, Cross, & Burnard (2013). It is being conducted with Tal-Chen Rabinowitch at ILABS, University of Washington, Seattle, funded by the Templeton Foundation (see the project website at Enhancing Empathy through Music), and preliminary results will be available soon.

Collaborators

Prof Sarah Hawkins

Dina Kronhaus

Key Publications

Selected publications since 2012:

(for a more complete list and access to preprints of papers and chapters, see <http://www-personal.mus.cam.ac.uk/~ic108/crosspubs96.html>)

Books

Hallam, S., Cross, I. & Thaut, M. (Eds.) (2016) *Oxford Handbook of Music Psychology*, (2nd edition). Oxford, Oxford University Press

Rebuschat, P., Rohrmeier, M., Hawkins, J. & Cross, I. (Eds.) (2012) *Language and music as cognitive systems*. Oxford University Press

Journal editing

Franco, F., & Cross, I. (2012). *Empirical Musicology Review*, 7 (1-2), special issue constituting proceedings of BPS seminar on "Language and music, meaning and entrainment", December 2012, Cambridge (see <http://emusicology.org/>).

Peer-reviewed papers

Bravo, F., Cross, I., Hawkins, S., Gonzalez, N., Docampo, J., Bruno, C., & Stamatakis, E. (2017). Neural Mechanisms underlying Valence Inferences to Sound: the Role of the right Angular Gyrus. *Neuropsychologia* [abstract]

Knight, S., Spiro, N., & Cross, I. (2017). Look, listen and learn: Exploring effects of passive entrainment on social judgements of observed others. *Psychology of Music*, 45(1), 99-115. [abstract]

Bravo, F., Cross, I., Stamatakis, E. A., & Rohrmeier, M. (2017). Sensory cortical response to uncertainty and low salience during recognition of affective cues in musical intervals. *PLOS ONE*, 12(4), e0175991.

Woolhouse, M., Tidhar, D., and Cross, I. (2016) Effects on interpersonal memory of dancing in time with others. *Frontiers in Psychology*, 7(167), 1-8.[NCBI]

Woolhouse, M., Cross, I. & Horton, T. (2016) Perception of non-adjacent tonic key relationships. *Psychology of Music*, 44(4), 802-815.[abstract]

Blake, E. & Cross, I. (2015) The acoustic and auditory contexts of human behaviour. *Current Anthropology* 56 (1), 81-103.[abstract]

Cross, I. (2014). Music and communication in music psychology. *Psychology of Music*, 42(6), 809-819.[abstract]

Cross, I. (2014). Artes & humanidades e as ciências: música e a mediação de tensões interdisciplinares/ The arts & humanities, and the sciences: music and the mediation of inter-disciplinary tensions. *Art Research Journal*, 1(1), 32-48.

Rohrmeier, M. A., & Cross, I. (2014). Modelling unsupervised online-learning of artificial grammars: Linking implicit and statistical learning. *Consciousness & Cognition*, 27c, 155-167.

Cross, I. (2013). "Does not compute?": music as real-time communicative interaction. *AI & Society*, 28(4), 415-430.

Rohrmeier, M. & Cross, I. (2013). Artificial grammar learning of melody is constrained by melodic inconsistency: Narmour's principles affect melodic learning. *PLoS ONE*, 8(7), e66174.

Rabinowitch, T-C, Cross, I. & Burnard, P. (2013). Long-term musical group interaction has a positive influence on empathy in children. *Psychology of Music*, 41(4), 484-498.

Cross, I. (2012). Cognitive science and the cultural nature of music. *Topics in Cognitive Science*, 4(4), 668-677.

Cross, I. (2012). Music, cultures and meanings: music as communication. *Empirical Musicology Review*, 7(1-2), 95-97.

Fritz, C., Blackwell, A. F., Cross, I., Moore, B.C.J. & Woodhouse, J. (2012). Exploring violin sound quality: investigating English timbre descriptors and correlating acoustical modifications with perceptual properties. *Journal of the Acoustical Society of America*, 131 (1), 783-794.

Chapters in books

Cross, I (2016). The nature of music and its evolution. In S. Hallam, I. Cross, and M. Thaut (Eds.) Oxford Handbook of Music Psychology, 2nd Edn, (pp 3-17), Oxford, Oxford University Press.

Cross, I. & Tolbert, E (2016). Music and meaning. In S. Hallam, I. Cross, and M. Thaut (Eds.) Oxford Handbook of Music Psychology, 2nd Edn, (pp 33-46), Oxford, Oxford University Press.

Stainsby, T. & Cross, I (2016). The perception of pitch. In S. Hallam, I. Cross, and M. Thaut (Eds.) Oxford Handbook of Music Psychology, 2nd Edn, (pp 63-79), Oxford, Oxford University Press.

Hallam, S., Cross, I & Thaut, M. (2016). Where now?. In S. Hallam, I. Cross, and M. Thaut (Eds.) Oxford Handbook of Music Psychology, 2nd Edn, (pp 905-913), Oxford, Oxford University Press.

Cross, I. (2015). Music, speech and meaning in interaction. In Christian Maeder & Mark Reybrouck (Eds.). Music, Analysis, Experience. New Perspectives in Musical Semiotics. (pp19-30), Leuven: Leuven University Press. ISBN 978 94 6270 044 4

Cross, I. & Morley, I. (2013). Muzyka a ewolucja. Natura dowodów naukowych. In Marcin Bogucki, Adrian Foltyn, Piotr Podlipniak, Piotr Przbysz, Hanny Winiszewski (Eds.), Neuroestetyka Muzyki (pp 296-306), Poznan, Poznanskiego Towarzystwa Przyjaciół Nauk.

Hawkins, S., Cross, I., & Ogden, R. (2013). Communicative interaction in spontaneous music and speech. In M. Orwin, C. Howes & R. Kempson (Eds.), Language, music, and interaction (pp285-329), London: College Publications.

Cross, I., Fitch, W. T., Aboitiz, F., Iriki, A., Jarvis, E. D., Lewis, J., Liebal, K., Merker, B., Stout, D., and Trehub, S. E. (2013). Culture and evolution. In Michael Arbib (Ed.) Language, music and the brain, (pp541-562), Strüngmann Forum Reports, Vol. 10, Cambridge, MA, MIT Press.

Rabinowitch, T-C, Cross, I. & Burnard, P. (2012). Between Consciousnesses: Embodied Musical Intersubjectivity. In M. Reason & D. Reynolds (Eds.), Kinesthetic Empathy in Creative and Cultural Practices, (pp109-120), Bristol, Intellect Press.

Cross, I. (2012). Music as an emergent exaptation. In N. Bannan (Ed.) Music, language and human evolution (pp263-276), Oxford, Oxford University Press.

Cross, I., Laurence, F. & Rabinowitch, T-C. (2012) Empathy and creativity in group musical practices; towards a concept of empathic creativity. In G. MacPherson and G. Welch (Eds.) Oxford Handbook of Music Education, (pp337-353). Oxford, Oxford University Press.

Cross, I. (2012). Music and biocultural evolution. Rewritten chapter for second edition of M. Clayton, R. Middleton, T. Herbert (Eds.) The Cultural Study of Music: A Critical Introduction (pp17-27), London, Routledge.

Cross, I. (2012). Music as social and cognitive process. In Rebuschat, P., Rohrmeier, M., Hawkins, J. & Cross, I. (Eds.) Language and music as cognitive systems, (pp315-328). Oxford, Oxford University Press.