

# WHAT IS MUSIC?

## Solving a Scientific Mystery

The science of music started more than 2000 years ago, when Pythagoras made his observations about consonant intervals and ratios of string lengths.

But despite all the advances made in acoustics, psychology, neuroscience and evolutionary biology, scientists still have no idea *what music is*.

The theory in this book is the result of more than 20 years of research by the author. It explains in detail many of the familiar features of music: notes, scales, melody, harmony, chords, home chords, bass, rhythm and repetition.

It also explains the symmetries of music. These symmetries include invariances under pitch translation, octave translation, time translation, time scaling, amplitude scaling and pitch reflection.

Most importantly, the theory explains the emotional effects of music, and this explanation sits firmly within the framework of modern evolutionary theory. For the benefit of those not fully familiar with the concepts of theoretical biology, what this means is that the theory explains how our ability to respond to music helps us *have more grandchildren*.

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by Philip Dorrell



Dedicated to  
Amanda and Natalie.



# Contents

<b>Acknowledgements</b>	<b>8</b>
<b>1 Introduction</b>	<b>9</b>
1.1 An Autobiographical History . . . . .	9
1.1.1 The Facts of Life . . . . .	9
1.1.2 The Mathematics of the Universe . . . . .	10
1.2 The Science and Mathematics of Music . . . . .	11
1.3 A First Breakthrough: 2D/3D . . . . .	12
1.4 A Second Breakthrough: Super-Stimulus . . . . .	13
1.5 The Rest of This Book . . . . .	14
1.5.1 Background Concepts . . . . .	14
1.5.2 The Super-Stimulus Theory . . . . .	14
1.5.3 Questions, Review and the Future . . . . .	16
<b>2 What is Music?</b>	<b>18</b>
2.1 Music is Something We Like . . . . .	18
2.2 The Biology of Feeling Good . . . . .	19
2.2.1 Having More Grandchildren . . . . .	19
2.2.2 Charles Darwin and His Theory . . . . .	20
2.3 Explaining Purposeful Behaviour . . . . .	23
2.3.1 Incorrect or Apparently Incorrect Sub-Goals . . . . .	25
2.4 Proof of our Ignorance About Music . . . . .	27
2.4.1 Subjective and Objective . . . . .	28
2.4.2 The Martian Scientist . . . . .	29
2.4.3 The Incompleteness of Music Theory . . . . .	30
2.4.4 Musical Formulae . . . . .	32
2.4.5 The Economics of Musical Composition . . . . .	33
2.5 Universality . . . . .	35
2.5.1 Author's Declaration . . . . .	38
2.6 Scientific Theories . . . . .	38
2.6.1 Testability and Falsifiability . . . . .	38
2.6.2 Simplicity and Complexity . . . . .	41
<b>3 Existing Music Science</b>	<b>44</b>
3.1 Existing Literature . . . . .	44
3.2 The Origins of Music . . . . .	45

3.3	The Archaeology of Music . . . . .	46
3.4	Common Assumptions . . . . .	48
3.4.1	The Evolutionary Assumption . . . . .	48
3.4.2	The Music Assumption . . . . .	49
3.4.3	The Communication Hypothesis . . . . .	50
3.4.4	The Social Assumption . . . . .	51
3.4.5	The “In the Past” Assumption . . . . .	52
3.4.6	The Music-Language Assumption . . . . .	53
3.4.7	The Cultural Assumption . . . . .	53
3.4.8	The Cortical Plasticity Assumption . . . . .	54
3.4.9	The Simultaneous Pitch Assumption . . . . .	55
3.4.10	Other Musical Aspect Assumptions . . . . .	57
3.5	Questions That Have to be Answered . . . . .	58
3.6	Approaches to Studying Music . . . . .	61
<b>4</b>	<b>Sound and Music</b>	<b>63</b>
4.1	Sound . . . . .	63
4.1.1	Vibrations Travelling Through a Medium . . . . .	63
4.1.2	Linearity, Frequency and Fourier Analysis . . . . .	64
4.2	Music: Pitch and Frequency . . . . .	71
4.2.1	Notes . . . . .	71
4.2.2	Intervals . . . . .	72
4.2.3	Scales . . . . .	73
4.2.4	Consonant Intervals . . . . .	75
4.2.5	Harmony and Chords . . . . .	76
4.2.6	Home Chords and Dominant Sevenths . . . . .	77
4.3	Musical Time . . . . .	78
4.3.1	Tempo . . . . .	81
4.4	Melody . . . . .	81
4.5	Accompaniments . . . . .	83
4.5.1	Harmonic Accompaniment . . . . .	83
4.5.2	Rhythmic Accompaniment . . . . .	84
4.5.3	Bass . . . . .	84
4.6	Other Aspects of Music . . . . .	84
4.6.1	Repetition . . . . .	84
4.6.2	Songs, Lyrics and Poetry . . . . .	85
4.6.3	Dance . . . . .	86
<b>5</b>	<b>Vector Analysis of Musical Intervals</b>	<b>87</b>
5.1	Three Different Vector Representations . . . . .	87
5.1.1	What is a Vector Space? . . . . .	88
5.1.2	1D Semitones Representation . . . . .	91
5.1.3	2D Tones/Semitones Representation . . . . .	92
5.1.4	3D Consonant Interval Representation . . . . .	92
5.2	Bases and Linear Mappings . . . . .	94
5.2.1	2D to 1D Natural Mapping . . . . .	95



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5.2.2	3D to 1D Natural Mapping . . . . .	99
5.2.3	3D to 2D Natural Mapping . . . . .	99
5.2.4	Images and Kernels . . . . .	100
5.2.5	Visualising the Syntonic Comma . . . . .	103
5.3	The Harmonic Heptagon . . . . .	105
<b>6</b>	<b>The Brain</b>	<b>107</b>
6.1	An Information Processing System . . . . .	107
6.1.1	Analogy with Computers . . . . .	108
6.2	The Neuron . . . . .	109
6.2.1	Comparison to Computer Components . . . . .	113
6.2.2	How Many Connections? . . . . .	114
6.3	Modularity in the Brain . . . . .	115
6.3.1	The Representation of Meaning . . . . .	118
6.3.2	Temporal Coding . . . . .	120
6.3.3	Localisation and Functional Maps . . . . .	122
6.4	Separation and Binding . . . . .	123
6.4.1	Colour Perception . . . . .	124
6.4.2	The Binding Problem . . . . .	125
6.5	Population Encoding . . . . .	127
<b>7</b>	<b>2D/3D Theory of Music</b>	<b>131</b>
7.1	More Vector Space Mappings . . . . .	131
7.1.1	Another Mapping from 2D to 1D . . . . .	131
7.1.2	Another Perceptual 3D to 2D Mapping . . . . .	132
7.2	The Looping Theory . . . . .	134
7.3	Outlook for the 2D/3D Theory . . . . .	135
<b>8</b>	<b>The Perception of Musicality</b>	<b>137</b>
8.1	Where is the Purpose? . . . . .	137
8.2	That Which is Like Music . . . . .	138
8.3	Corollaries to the Hypothesis . . . . .	142
8.3.1	What is Musicality? . . . . .	143
8.3.2	The Dimensionality of Musicality . . . . .	144
8.3.3	Subjective Awareness of Musicality . . . . .	144
8.3.4	Double Dissociation . . . . .	145
8.3.5	Differences in Melody and Rhythm . . . . .	146
8.3.6	Attributes Apparently Absent in Speech . . . . .	147
8.3.7	Implications for Cortical Maps . . . . .	148
8.4	Explaining Musical Behaviours . . . . .	148
8.4.1	Dance . . . . .	150
<b>9</b>	<b>Symmetries</b>	<b>151</b>
9.1	Definition of Symmetry . . . . .	151
9.1.1	Symmetries of Physics . . . . .	153
9.2	A Little More Mathematics . . . . .	155
9.2.1	Discrete and Continuous . . . . .	155

9.2.2	Generators . . . . .	156
9.2.3	Stronger and Weaker Symmetries . . . . .	156
9.3	Musical Symmetries . . . . .	157
9.3.1	Pitch Translation Invariance . . . . .	158
9.3.2	Octave Translation Invariance . . . . .	160
9.3.3	Octave Translation and Pitch Translation . . . . .	161
9.3.4	Time Scaling Invariance . . . . .	162
9.3.5	Time Translation Invariance . . . . .	162
9.3.6	Amplitude Scaling Invariance . . . . .	163
9.3.7	Pitch Reflection Invariance . . . . .	164
9.4	Invariant Characterisations . . . . .	165
9.4.1	Application to Biology . . . . .	167
9.4.2	Frames of Reference . . . . .	169
9.4.3	Complete and Incomplete Representations . . . . .	169
<b>10</b>	<b>Musical Cortical Maps</b>	<b>172</b>
10.1	Cortical Plasticity . . . . .	172
10.1.1	Plasticity and Theories of Music . . . . .	176
10.2	Musicality in Cortical Maps . . . . .	177
10.3	The Regular Beat Cortical Map . . . . .	178
10.3.1	Symmetries of Regular Beat Perception . . . . .	182
10.3.2	Unification . . . . .	183
10.4	The Harmonic Cortical Map . . . . .	183
10.4.1	Active Zones . . . . .	187
10.4.2	Octave Translation Invariant Representations . . . . .	187
10.4.3	Intensity Invariance . . . . .	187
10.5	The Bass Cortical Map . . . . .	188
10.6	The Scale Cortical Map . . . . .	189
10.7	The Home Chord Cortical Map . . . . .	193
10.7.1	Why Reflective Symmetry? . . . . .	196
10.7.2	Alternative Theory: The Dominant 7th . . . . .	196
10.7.3	The Evolution of Cortical Maps . . . . .	197
10.8	The Note Duration Cortical Map . . . . .	198
10.9	The Melodic Contour Cortical Map . . . . .	199
<b>11</b>	<b>Octave Translation Invariance</b>	<b>200</b>
11.1	Octave Translation Invariant Aspects of Music . . . . .	200
11.2	Separation of Concerns . . . . .	201
11.3	Digital versus Analogue . . . . .	201
11.4	Digital Representations in the Brain . . . . .	203
11.5	Split Representation of Pitch . . . . .	205
11.6	Octaves and Consonant Intervals . . . . .	209
<b>12</b>	<b>Calibration</b>	<b>210</b>
12.1	A Four-Way Relationship . . . . .	210
12.2	Making Measurement Accurate . . . . .	211

---

12.2.1	Interpolation . . . . .	213
12.2.2	Complex Fractions . . . . .	214
12.2.3	Arithmetic . . . . .	214
12.2.4	Not Measuring Non-Harmonic Intervals . . . . .	215
12.3	Calibration Experiments . . . . .	217
12.4	Temporal Coding . . . . .	218
12.5	Other Calibrations . . . . .	219
12.5.1	Calibration of Octave Perception . . . . .	219
12.5.2	Calibrating Ratios of Durations . . . . .	219
12.5.3	Calibrating Against Regular Beats . . . . .	220
<b>13</b>	<b>Repetition</b>	<b>222</b>
13.1	Repetition as a Super-Stimulus . . . . .	222
13.2	Reasons for Perception of Repetition . . . . .	224
13.3	Perceptual State Machines . . . . .	225
13.3.1	A Neuronal State Machine . . . . .	226
13.4	The Flow Model . . . . .	226
13.4.1	Breaking Out of the Loop . . . . .	228
13.4.2	Almost Exact Repetitions . . . . .	228
13.4.3	Faking $n$ Dimensions in 2-Dimensional Maps . . . . .	229
13.5	Non-Free Repetition: Summary . . . . .	231
13.6	Free Repetition and Home Chords . . . . .	232
13.7	Reduplication . . . . .	234
<b>14</b>	<b>Final Theory</b>	<b>235</b>
14.1	The Story So Far . . . . .	235
14.2	So What is Musicality? . . . . .	236
14.2.1	A List of Clues . . . . .	237
14.2.2	Musicality is an Attribute of Speech . . . . .	237
14.2.3	The Emotional Effect of Music . . . . .	238
14.2.4	Different Aspects and Genres . . . . .	239
14.2.5	Constant Activity Patterns . . . . .	240
14.3	The Musicality Neuron . . . . .	242
14.4	Discount Factors . . . . .	246
14.5	The Meaning of Musicality . . . . .	248
14.5.1	The Conscious Arousal Hypothesis . . . . .	249
14.5.2	Arousal, Emotion and Emphasis . . . . .	252
14.6	Other Cortical Maps . . . . .	253
14.7	Implication of Identified CAP . . . . .	254
14.8	Can CAP be Consciously Controlled? . . . . .	255
14.9	Constraints . . . . .	255
14.9.1	The Implications of Constraint . . . . .	258
14.10	Compromises and Rule-Breaking . . . . .	260
14.11	Aspectual Cross-Talk . . . . .	262
14.12	Music/Speech Specialisation . . . . .	263
14.12.1	Double Dissociation Revisited . . . . .	265

14.12.2	The Implied Importance of Musicality . . . . .	265
<b>15</b>	<b>Questions and Further Research</b>	<b>267</b>
15.1	Questions Answered by the Theory . . . . .	267
15.2	Outstanding Questions . . . . .	269
15.2.1	The Effect of Loudness . . . . .	269
15.2.2	Stereo versus Mono . . . . .	270
15.2.3	Rhyme . . . . .	270
15.2.4	Timbre . . . . .	270
15.2.5	Home Chords . . . . .	274
15.3	Further Research . . . . .	274
15.3.1	Brain Studies . . . . .	274
15.3.2	Musical Brain Studies . . . . .	275
15.3.3	Constant Activity Patterns . . . . .	275
15.3.4	Calibration . . . . .	276
15.3.5	Symmetries . . . . .	276
15.3.6	Repetition: Free and Non-Free . . . . .	277
15.3.7	Cortical Maps . . . . .	277
15.3.8	Musicality . . . . .	277
15.3.9	Non-Typical Musical Aspects . . . . .	278
15.3.10	Mathematical Models . . . . .	279
15.4	Musical Taste . . . . .	280
15.4.1	Why Does Musical Taste Vary? . . . . .	280
15.4.2	Variation in Super-Stimuli . . . . .	280
15.4.3	Variation in Musicality Perception . . . . .	280
15.4.4	Dependence on Exposure to Language . . . . .	282
15.4.5	Dependence on Exposure to Music . . . . .	282
15.4.6	Adaptation and CAP-Detectors . . . . .	284
15.4.7	Why Language Makes Little Difference . . . . .	284
15.5	Intensity/Position Conversion . . . . .	285
15.6	Choruses and Verses . . . . .	286
15.7	The Pleasure of Music . . . . .	288
<b>16</b>	<b>Review of Assumptions</b>	<b>289</b>
16.1	General Assumptions . . . . .	289
16.1.1	Information Processing . . . . .	289
16.1.2	The Importance of Musicality . . . . .	290
16.1.3	We Need to Explain Perception of Musicality . . . . .	291
16.1.4	Musicality of Speech . . . . .	291
16.1.5	Music is a Super-Stimulus . . . . .	292
16.1.6	Emotions . . . . .	293
16.1.7	Our Emotions, Not the Speaker's . . . . .	293
16.1.8	Musicality is Not Emotion-Specific . . . . .	293
16.1.9	Musical Cortical Maps . . . . .	294
16.1.10	Symmetries . . . . .	295
16.2	Individual Cortical Maps . . . . .	298

---

16.2.1	Scale Map . . . . .	298
16.2.2	Harmonic Map . . . . .	298
16.2.3	Home Chord Map . . . . .	299
16.2.4	Regular Beat Map . . . . .	300
16.2.5	Note Duration Map . . . . .	300
16.2.6	Melodic Contour Map . . . . .	300
16.3	Repetition . . . . .	300
16.4	Assumptions of the Final Theory . . . . .	300
16.4.1	General Principle of Music . . . . .	300
16.4.2	Echoing . . . . .	301
16.4.3	General Principle and Conscious Arousal . . . . .	301
16.4.4	Constant Activity Patterns . . . . .	301
<b>17</b>	<b>The Future of Music</b>	<b>303</b>
17.1	Music as a Commercial Enterprise . . . . .	303
17.1.1	Composition Technology . . . . .	305
17.1.2	Profiting from a Complete Theory . . . . .	306
17.2	A Post-Music-Theory World . . . . .	307
17.2.1	Music Junkies? . . . . .	310
17.2.2	The Future . . . . .	311
	<b>Bibliography</b>	<b>312</b>
	<b>Index</b>	<b>314</b>

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