



A Combinational Creativity Approach to Composing Traditional Irish Reels

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INTRODUCTION

- The most common forms of traditional dance music are reels, double jigs and hornpipes [1].
- [2] describes combinational creativity as “*novel combinations of old ideas*”.
- It is clear from any analysis of a corpus of traditional music that there are many examples of combinational creativity.
- This poster describes a *combinational creativity* algorithm that can compose new reels.
- It takes advantage of the fact that half bars in tunes from the corpus often occur several times in a tune.
- To test the system, we selected nine computer generated tunes and one human composed tune for comparison.

BACKGROUND

- Current estimates suggest there are at least seven thousand traditional tunes in existence [3]
- Widespread knowledge of a common repertoire did not occur until the publication of catalogues of traditional tunes such as O’Neill’s The Music of Ireland in 1903.

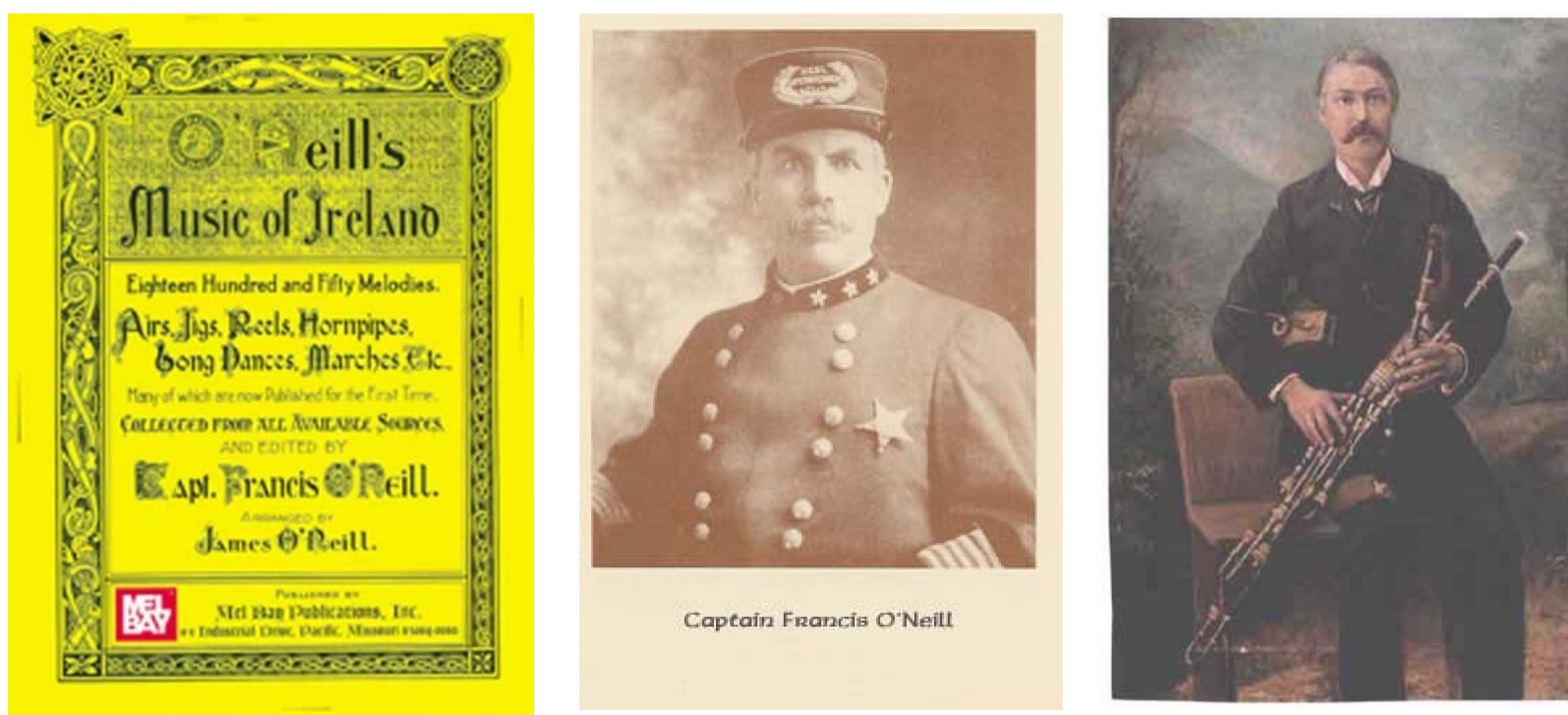


Figure 1: Police Chief Francis O’ Neill’s “Dance Music of Ireland” (1903)

- In 1991, the ABC music notation language was introduced by Chris Walshaw [4].
- Our system uses a corpus of 864 reels in ABC format drawn from Henrik Norbeck’s transcriptions [5].

APPROACH

- The system looks at both the structure of each tune and also the note sequences in each tune.
- We first apply an algorithm to reveal repeated patterns
- Tunes are converted to a sequence of token numbers.
- We generate 800 tune structures from the corpus.
- We analyse note sequences in the corpus using n-grams.
- With n value equals to 4, there are 220,000 4-grams in the corpus.

BG~G2	BGcG	BG~G2	Bdgd	BG~G2	BdcB		1	2		3		1	4
ADFG	ABcA	:	2	AGFG	ABcA					5	6		
~g3d	BGBd	~g2eg	faaf	g2gd	BddB		ADFG			1	2		3
ABcA										7	6		
~g3d	BGBd	~g2eg	fa~a2	bgaf	gedB		AGFG			8	9		10
ABcA										13	5	6	
Bdgd	Bdgd	Bdgd	BG~G2		Ac=fc					8	9		10
Acfc		Ac=fc	BG~G2							16	7	6	
Bdgd	Bdgd	Bdef	~g3a	bgaf	gedB		AGFG			3	3		3
ABcA										18	17	1	

ID	GramContent	GramN	Key
181138	BGG2		4 Gmix
181139	GG2B		4 Gmix
181140	G2BG		4 Gmix
181141	BGcG		4 Gmix
181142	GcGB		4 Gmix
181143	cGBG		4 Gmix

Figure 2: An analysis of the tune “The Flogging Reel”

- To generate a new tune, the system takes a structure at random from the database.
- Based on the key of the structure, the algorithm fetches an appropriate number of n-grams (stochastic sampling) from the database and fills in an n-gram token into each token in the sequence.
- For each structure, a user configurable number of new tunes can be generated.

From newTunesL.abc



Figure 3: An example of one of the computer generated tunes

EVALUATION

- Nine computer generated tunes and one human composed tune were used.
- We created an online survey using phpESP and asked subjects to rate each tune on a scale from one (poor) to five (excellent).
- Twenty nine expert subjects
- A lively discussion as to which was the human composed tune on one of forums [6, 7].
- Subjects felt that many of the tunes combined interesting and aesthetically appealing phrases with atonal and unusual phrases.

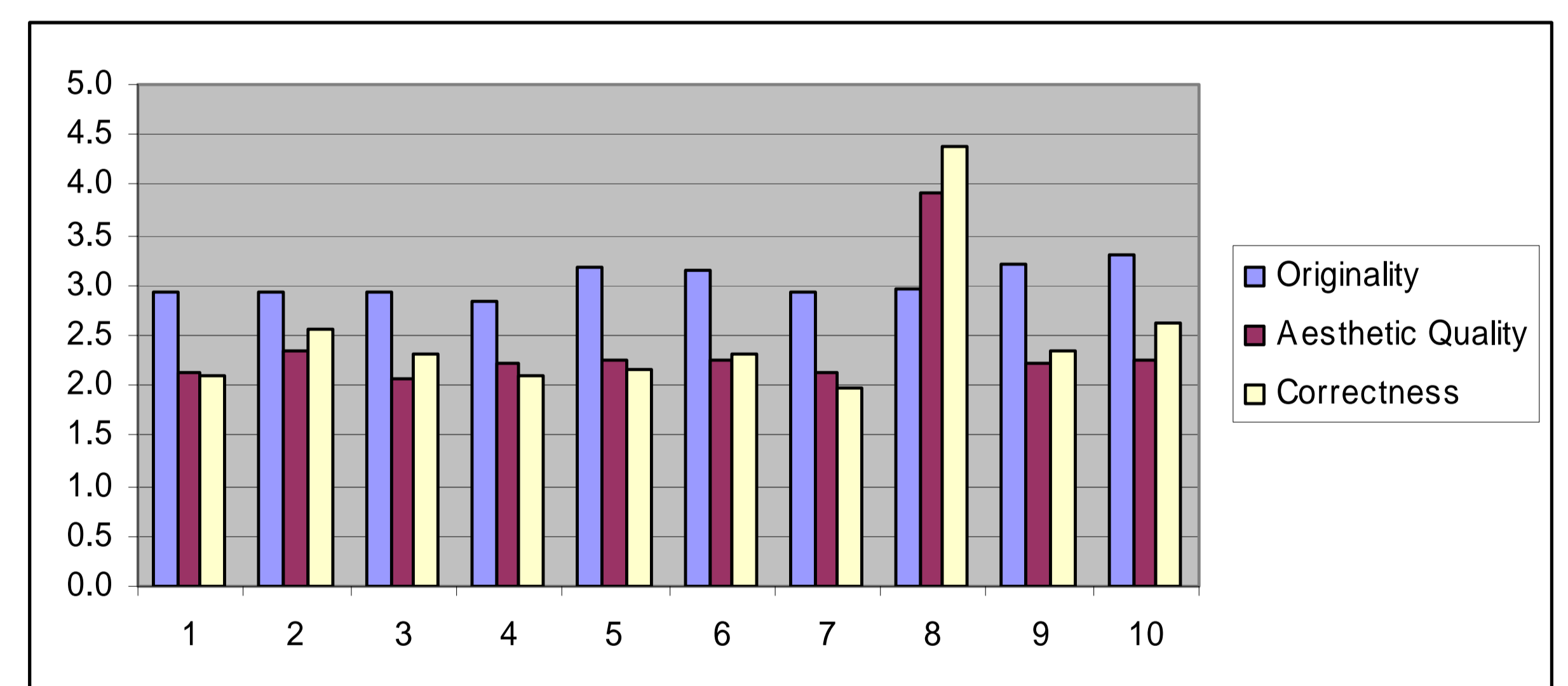


Figure 3: User evaluations of the generated tunes (tune 8 is composed by a human)

CONCLUSIONS

- Some of the tunes possess interesting chord progressions and are curiously pleasing although they are in many ways different to what most listeners would classify as traditional reels.
- Our use of random n-grams from the corpus needs further work
- The tunes used in this test can be listened to here:

<http://www.bryanduggan.com/phpESP/public/survey.php?name=GeneratedTunes>.

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