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AN EXAMINATION OF THE CHANCE ELEMENTS IN
WITOLD LUTOSŁAWSKI'S MUSIC, WITH PARTICULAR
ATTENTION TO ITS FUNCTION AS A MODEL FOR
COMPOSITIONAL PRACTICE.

A THESIS AND PORTFOLIO PRESENTED IN FULFILLMENT OF
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PIETA HEXTALL
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Abstract:

This thesis studies the use of aleatory techniques in Witold Lutosławski's music and the issues that arise when using aleatoricism, a branch of textural composition that has room for exploration. I focused my study on three of Lutosławski's major works, analysing his approach to aleatoricism, form, and macro- and micro-rhythm. I wrote three works for the portfolio component. My approach to aleatoricism differed in each work. Through studying Lutosławski and my own composition, I came across practical issues in creating the score, issues with performers, and compositional problems. However, once these issues were worked through, aleatoricism is an exciting compositional device that is not yet tired.

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Portfolio of Compositions

Our Own Demise

Our Own Demise



Pieta Hextall

Programme Note

In the beginning humans were like every other species, free.
Only the laws of nature governed their lives.
As they evolved and as societies developed, the nature of freedom changed.

Humans have two very important skills that are not shared with the rest or at least with the majority of the animal kingdom.

- (1) the ability to build tools
- (2) the ability of foresight - to look forward to generations of the future and create a world that they believe the next generation would like to live in

Human society has turned from a natural and essentially free society to one that is cold, full of steel, and controlled by the state and the modern capitalist economy.

One by one our freedoms are taken from us.

Instrumentation

3 Flutes (third doubling piccolo)

2 Oboes

2 Clarinets in Bb

Bass Clarinet in Bb

2 Bassoons

Contrabassoon

4 Horns in F

4 Trumpets in C

3 Trombones

Bass Trombone

Tuba

Percussion 1 - Glockenspiel, Triangle,

Large Suspended Cymbal,

Small Suspended Cymbal,

Bass Drum, Wood Block

Percussion 2 - Xylophone, Snare Drum,

Large Suspended Cymbal,

Small Suspended Cymbal

Solo Violin

Solo Viola

Violin I

Violin II

Viola

Cello

Double Bass

Performance Notes

At figure 3 all players begin on downbeat and must play the specified rhythm. The sound is up to the individual player. A short unpitched percussive sound is required. Pitches in extreme registers are allowed. Ideas for other sounds: tongue rams; slap tongues; mouthpiece/reed squeaks; key percussion; multiphonics; hitting instruments; pizzicato; snap pizzicato; col legno; etc

All glisses should start immediately.

In unmetered sections accidentals apply only to the pitch immediately following.

1 Slow, legato ♩ = 48

Flute 1
pp cresc. poco a poco *(p)*

Flutes 2 & 3
pp cresc. poco a poco *(p)*

Oboes 1 & 2
pp cresc. poco a poco *(p)*

Clarinet 1 in B \flat
pp cresc. poco a poco *(p)*

Clarinet 2 in B \flat
pp cresc. poco a poco *(p)*

Bass Clarinet in B \flat
pp cresc. poco a poco *(p)*

Bassoons 1 & 2
pp cresc. poco a poco *(p)*

Contrabassoon
pp cresc. poco a poco *(p)*

Horns 1 & 3 in F
 1. *pp cresc. poco a poco* *(p)*
 3.

Horns 2 & 4 in F

Trumpets 1 & 2 in C

Trumpet 2 & 4 in C

Trombone 1 & 2
 1. *pp cresc. poco a poco* *(p)*

Trombone 3

Bass Trombone

Tuba

Percussion 1

Percussion 2

Solo Violin
pp cresc. poco a poco *(p)*

Violins I
pp cresc. poco a poco *(p)*

Violins II
pp cresc. poco a poco *(p)*

Violas
pp cresc. poco a poco *(p)*

Cellos
pp cresc. poco a poco *(p)*

Double Basses

Unmetered until figure 13
 All players begin on downbeat
3 Each player moves through the boxes in their own time
 When all players have reached the final box move onto the next section
 This section should last anywhere between 1-2 minutes

In own tempo, do not follow anyone

Fl. 1 & 2

Fl. 3

Ob.

Cl. 1

Cl. 2

B. Cl.

Bsn. 1 & 2

Cbn.

Hn. 1 & 3

Hn. 2 & 4

C Tpt. 1 & 2

C Tpt. 3 & 4

Tbn. 1 & 2

Tbn. 3

B. Tbn.

Tbn.

Perc. 1

Perc. 2

Vln. I

Vln. II

Vla.

Vc.

Db.

This page of a musical score contains 28 staves, each representing a different instrument or section. The staves are arranged vertically and are connected by a large brace on the left side. The instruments listed on the left are: Fl. 1 & 2, Fl. 3, Ob., Cl. 1, Cl. 2, B. Cl., Bsn. 1 & 2, Cbn., Hn. 1 & 3, Hn. 2 & 4, C Tpt. 1 & 2, C Tpt. 3 & 4, Tbn. 1 & 2, Tbn. 3, B. Tbn., Tbn., Perc. 1, Perc. 2, Vln. I, Vln. II, Vla., Vcl., and Dbl. Each staff contains musical notation, including notes, rests, and dynamic markings. The notation is consistent across all staves, indicating a unified musical piece. The page number '10' is located at the top left, and the page number '12' is located at the top right.

Fl. 1 & 2

Fl. 3

Ob.

Cl. 1

Cl. 2

B. Cl.

Bsn. 1 & 2

Cbso.

Hn. 1 & 3

Hn. 2 & 4

C Tpt. 1 & 2

C Tpt. 3 & 4

Tbn. 1 & 2

Tbn. 3

B. Tbn.

Tbn.

Perc. 1

Perc. 2

Vln. I

Vln. II

Vla.

Vc.

Db.

Each section until figure 13 should last between 30 seconds and 1 minute
Section length is at the conductors discretion
All players begin on downbeat

12

4
ord. In own tempo
Pauses should last between 4 and 7 seconds

Musical score for woodwinds and brass instruments. The score is divided into two systems. The first system includes parts for Horns 1 & 3, Horns 2 & 4, Clarinets 1 & 2, Clarinets 3 & 4, Trombones 1 & 2, Trombone 3, Baritone Trombone, and Trombone. The second system includes parts for Violin I, Violin II, Viola, Violoncello, and Double Bass. Each part contains a series of notes with dynamic markings (p) and articulation (ord.).

5 All strings enter on downbeat
In own tempo

Musical score for string instruments. The score is divided into two systems. The first system includes parts for Horns 1 & 3, Horns 2 & 4, Clarinets 1 & 2, Clarinets 3 & 4, Trombones 1 & 2, Trombone 3, Baritone Trombone, and Trombone. The second system includes parts for Violin I, Violin II, Viola, Violoncello, and Double Bass. Each part contains a series of notes with dynamic markings (p) and articulation (ord.).

Each section until figure 13 should last between 30 seconds and 1 minute
Section length is at the conductors discretion
All players begin on downbeat
In own tempo
Pauses should last between 4 and 7 seconds

12

4
ord.

Musical score for Figure 4, measures 1-4. The score includes parts for Horns (Hn. 1 & 3, Hn. 2 & 4), Trumpets (C Tpt. 1 & 2, C Tpt. 3 & 4), Trombones (Tbn. 1 & 2, Tbn. 3, B. Tbn., Tbn.), and Violins (Vln. I, Vln. II, Vla., Vcl., Vcb.). Each part contains a sequence of notes with dynamic markings (*p*) and articulation (*ord.*).

5 All strings enter on downbeat
In own tempo

Musical score for Figure 5, measures 1-4. The score includes parts for Horns (Hn. 1 & 3, Hn. 2 & 4), Trumpets (C Tpt. 1 & 2, C Tpt. 3 & 4), Trombones (Tbn. 1 & 2, Tbn. 3, B. Tbn., Tbn.), and Strings (Vln. I, Vln. II, Vla., Vcl., Vcb.). The string parts enter on the downbeat with dynamic marking (*p*) and instruction "start gliss immediately". The woodwind and brass parts are blank.

6 Indicate downbeat to start cresc.
Once **f** is reached, next downbeat is figure 8

The image shows a musical score for a full orchestra. The instruments listed on the left are: Hn. 1 & 3, Hn. 2 & 4, C Tpt. 1 & 2, C Tpt. 3 & 4, Tbn. 1 & 2, Tbn. 3, B. Tbn., Tbn., Vla. I, Vla. II, Vln., Vc., and Db. Each instrument's staff contains the instruction *p cresc. poco a poco to f*. The score is presented as a series of empty staves with the instruction written in the first measure of each.

This page contains 14 musical staves, each with a label on the left side. The staves are arranged vertically and are currently blank. The labels are as follows:

- Hn. 1 & 3
- Hn. 2 & 4
- C Tpt. 1 & 2
- C Tpt. 3 & 4
- Tbn. 1 & 2
- Tbn. 3
- B. Tbn.
- Tbn.
- Vln. I
- Vln. II
- Vla.
- Vc.
- Db.

7 All players enter on downbeat
Own tempo between ♩ = 86-108

15

The musical score for page 18, rehearsal mark 7, features the following parts and markings:

- Fl. 1 & 2:** Flutes 1 and 2, marked *mp* and *ord.*
- Fl. 3:** Flute 3, marked *mp* and *ord.*
- Ob.:** Oboe, marked *mp* and *ord.*
- Cl. 1:** Clarinet 1, marked *mp* and *ord.*
- Cl. 2:** Clarinet 2, marked *mp* and *ord.*
- B. Cl.:** Bass Clarinet, marked *mp* and *ord.*
- Bsn. 1 & 2:** Bassoons 1 and 2, marked *mp* and *ord.*
- Cb.:** Contrabassoon, marked *mp* and *ord.*
- Perc. 1:** Percussion 1 (Glockenspiel), marked *mp*.
- Perc. 2:** Percussion 2 (Xylophone), marked *mp*.

The score includes various musical notations such as triplets, slurs, and dynamic markings. The tempo is specified as "Own tempo between ♩ = 86-108".

This page of a musical score contains parts for various instruments. The woodwind section includes Flutes 1 & 2, Flute 3, Oboe, Clarinet 1, Clarinet 2, Bass Clarinet, and Contrabass. The brass section includes Trumpets 1 & 2 and Trombones. The percussion section includes Percussion 1 and Percussion 2. The score is written in a single system with multiple staves. It features complex rhythmic patterns, including triplets and sixteenth-note runs, and is heavily marked with slurs and accents. The notation is dense, with many notes beamed together, particularly in the woodwind and brass parts.

FL. 1 & 2

FL. 3

Ob.

Cl. 1

Cl. 2

B. Cl.

Bsn. 1 & 2

Chbn.

Perc. 1

Perc. 2

The musical score on page 20 consists of ten staves. The top two staves are for Flutes 1 & 2, the third for Flute 3, the fourth for Oboe, the fifth and sixth for Clarinets 1 and 2, the seventh for Bass Clarinet, the eighth and ninth for Bassoons 1 & 2, the tenth for Contrabassoon, and the eleventh and twelfth for Percussion 1 and Percussion 2. The score features various musical notations including triplets, slurs, and dynamic markings. The percussion parts are particularly active, with Percussion 1 and Percussion 2 playing complex rhythmic patterns. The woodwind parts are more melodic and often feature slurs and triplets. The overall texture is dense and rhythmic.

8 woodwind and percussion cut off
cue brass and strings
all players begin on downbeat

The image shows a musical score for a full orchestra. The score is divided into two main sections. The first section, from the top to the middle, consists of woodwind and brass parts. The second section, from the middle to the bottom, consists of string parts. Each part is written on a five-line staff. The woodwind parts include Flutes (Hn. 1 & 3, Hn. 2 & 4), Clarinets (C Tpt. 1 & 2, C Tpt. 3 & 4), Trumpets (Tbn. 1 & 2, Tbn. 3), and Trombones (B. Tbn., Tbn.). The string parts include Violins (Vln. I, Vln. II), Violas (Vla.), Cellos (Vc.), and Double Basses (Db.). The woodwind and brass parts feature a series of five notes, each marked with a dynamic of *mf* and a fermata. The string parts feature a series of five notes, each marked with a dynamic of *f* and the instruction *stacc gliss immediately*.

Hn. 1 & 3
mf — *mf* — *mf* — *mf* — *mf* —

Hn. 2 & 4
mf — *mf* — *mf* — *mf* — *mf* —

C Tpt. 1 & 2
mf — *mf* — *mf* — *mf* — *mf* —

C Tpt. 3 & 4
mf — *mf* — *mf* — *mf* — *mf* —

Tbn. 1 & 2
mf — *mf* — *mf* — *mf* — *mf* —

Tbn. 3
mf — *mf* — *mf* — *mf* — *mf* —

B. Tbn.
mf — *mf* — *mf* — *mf* — *mf* —

Tbn.
mf — *mf* — *mf* — *mf* — *mf* —

Vln. I
f *stacc gliss immediately*

Vln. II
f *stacc gliss immediately*

Vla.
f *stacc gliss immediately*

Vc.
f *stacc gliss immediately*

Db.
f *stacc gliss immediately*

9

brass cut off
cue woodwind and percussion
all players begin on downbeat

19

Musical score for woodwinds and percussion, measures 19-22. The score includes parts for Flute 1 & 2, Flute 3, Oboe, Clarinet 1, Clarinet 2, Bass Clarinet, Bassoon 1 & 2, Contrabassoon, Percussion 1 (Eckentagel), Percussion 2 (Schubhorn), Violin 1, Violin 2, Viola, Violoncello, and Double Bass. The woodwind parts feature complex rhythmic patterns with triplets and sixteenth notes, often marked with a forte (f) dynamic. Percussion 1 and 2 play specific rhythmic patterns corresponding to the woodwind parts. The string parts are currently blank.

This page of a musical score contains staves for various instruments. The woodwind section includes Flutes 1 & 2, Flute 3, Oboe, Clarinets 1 & 2, Bass Clarinet, Bassoons 1 & 2, and Contrabassoon. The percussion section includes Percussion 1 and Percussion 2. The string section includes Violin 1, Violin 2, Viola, Violoncello, and Double Bass. The woodwinds and percussion are active with complex rhythmic patterns, including triplets and sixteenth-note runs, while the strings are currently silent.

Fl. 1 & 2

Fl. 3

Ob.

Cl. 1

Cl. 2

B. Cl.

Bsn. 1 & 2

Chon.

Perc. 1

Perc. 2

Vln. I

Vln. II

Vla.

Vc.

Db.

The musical score for page 24 (page number 21) features a variety of instruments. The woodwinds, including Flutes 1 & 2, Flute 3, Oboe, Clarinets 1 & 2, Bass Clarinet, Bassoons 1 & 2, and Contrabassoon, are shown with complex melodic lines and triplets. The percussion section, consisting of Percussion 1 and 2, has a rhythmic pattern. The string section, including Violins 1 & 2, Viola, Violoncello, and Double Bass, is currently blank.

10 woodwind and percussion cut off
cue brass
all players begin on downbeat

con sord.

The image shows a musical score for woodwind and percussion instruments. It consists of ten staves, each with a double bar line at the top and bottom. The staves are labeled on the left as follows: Hn. 1 & 3, Hn. 2 & 4, C Tpt. 1 & 2, C Tpt. 3 & 4, Tbn. 1 & 2, Tbn. 3, B. Tbn., Tbn., Vln. I, Vln. II, Vla., Vcl., and Db. Each staff contains a series of six slanted lines, each starting with a dynamic marking 'p'. Below each staff, the text 'con sord.' is written. The staves are arranged vertically, with Hn. 1 & 3 at the top and Db. at the bottom.

10 woodwind and percussion cut off
cue brass
all players begin on downbeat

con sord.

The musical score consists of 13 staves, each with a double bar line at the beginning. The staves are labeled on the left as follows: Hn. 1 & 3, Hn. 2 & 4, C Tpt. 1 & 2, C Tpt. 3 & 4, Tbn. 1 & 2, Tbn. 3, B. Tbn., Tbn., Vln. I, Vln. II, Vla., Vcl., and Db. Each staff contains a series of six slanted lines, each preceded by a dynamic marking 'p'. The slanted lines are positioned on the first half of the staff, indicating a specific rhythmic pattern. The 'con sord.' instruction is placed below the first five staves.

11 cue woodwind and percussion
all players begin on downbeat

23

This page contains a musical score for woodwind and percussion instruments. The instruments listed on the left are: Fl. 1 & 2, Fl. 3, Ob., Cl. 1, Cl. 2, B. Cl., Bsn. 1 & 2, Cbn., Hn. 1 & 3, Hn. 2 & 4, C Tpt. 1 & 2, C Tpt. 3 & 4, Tbn. 1 & 2, Tbn. 3, B. Tbn., Tbn., Perc. 1 (Cobocanpi), Perc. 2 (Szyloham), Vln. I, Vln. II, Vla., Vc., and Db. The score begins with a dynamic marking of *f* (forte) for most instruments. The woodwind parts (Flutes, Oboe, Clarinets, Bassoon, and Horns) feature complex rhythmic patterns with many beamed notes and slurs. The percussion parts include specific cues for 'Cobocanpi' and 'Szyloham'. The strings (Violins, Viola, Violoncello, and Double Bass) are marked with *f* and have relatively simple, sustained notes. The score is written on a grand staff with multiple systems of staves.

This page of a musical score contains staves for various instruments. The woodwind section includes:

- Fl. 1 & 2: Flute parts with complex rhythmic patterns and triplets.
- Fl. 3: Flute part with similar rhythmic patterns.
- Ob.: Oboe part with sustained notes and some rhythmic movement.
- C. 1 & 2: Clarinet parts with rhythmic patterns.
- B. Cl.: Bass Clarinet part with rhythmic patterns.
- Bsn. 1 & 2: Bassoon parts with rhythmic patterns.
- Chbn.: Contrabassoon part with rhythmic patterns.

The brass section includes:

- Hn. 1 & 3: Horn parts, currently blank.
- Hn. 2 & 4: Horn parts, currently blank.
- C Tpt. 1 & 2: Trumpet parts, currently blank.
- C Tpt. 3 & 4: Trumpet parts, currently blank.
- Tbn. 1 & 2: Trombone parts, currently blank.
- Tbn. 3: Trombone part, currently blank.
- B. Tbn.: Baritone Trombone part, currently blank.
- Tbn.: Tuba part, currently blank.

The percussion section includes:

- Perc. 1: Percussion part with rhythmic patterns.
- Perc. 2: Percussion part with rhythmic patterns.

The string section includes:

- Vln. I: Violin I part, currently blank.
- Vln. II: Violin II part, currently blank.
- Vla.: Viola part, currently blank.
- Vc.: Violoncello part, currently blank.
- Db.: Double Bass part, currently blank.

The score features various musical notations such as slurs, ties, and triplets.

Fl. 1 & 2

Fl. 3

Ob.

Cl. 1

Cl. 2

B. Cl.

Bsn. 1 & 2

Cbsn.

Hn. 1 & 3

Hn. 2 & 4

C Tpt. 1 & 2

C Tpt. 3 & 4

Tbn. 1 & 2

Tbn. 3

B. Tbn.

Tbn.

Perc. 1

Perc. 2

Vln. I

Vln. II

Vla.

Vc.

12

Expressively, slower $\text{♩} = 60$
In tempo, soloist can stretch time a littleG.P.
(give time for strings to attach mutes)

Musical score for rehearsal mark 12, measures 1-4. The score includes parts for Solo Vln., Vln. I, Vln. II, Vla., and Vc. The Solo Vln. part features a melodic line with triplets and slurs. The string parts are marked "con sord." and "pp".



Continuation of the musical score for rehearsal mark 12, measures 5-8. The Solo Vln. part continues with complex rhythmic patterns and slurs. The string parts remain marked "con sord." and "pp".



13

Expressively, a bit faster $\text{♩} = 72$
strictly in tempo

Musical score for rehearsal mark 13, measures 1-8. The score includes parts for Fl. I & 2, Ob., Cl. I, Bsn. I & 2, Solo Vln., Solo Vla., Vln. I, Vln. II, Vla., and Vc. The woodwind and soloist parts feature melodic lines with triplets and slurs. The string parts are marked "p".

14

Musical score for measures 14-15. The score includes parts for Fl. I & 2, Ob., Cl. I, Cl. II, Bsn. I & 2, Solo Vln., Vln. I, Vln. II, Vla., and Vc. The woodwinds and strings play complex rhythmic patterns with triplets and slurs. Dynamics include *pp* and *p*. The strings are marked *senza cord.* (without bow).



15 Slightly faster $\text{♩} = 84$

Musical score for measures 16-17. The score includes parts for Bsn. I & 2, Chn., Vln. I, Vln. II, Vla. (divisi), Vc., and Db. The woodwinds and strings play complex rhythmic patterns with triplets and slurs. Dynamics include *f*. The strings are marked *divisi*.

28

Expressively, slower $\text{♩} = 72$

Musical score for measures 28-31, tempo *Expressively, slower* $\text{♩} = 72$. The score includes parts for:

- Bsn. I & 2
- Con.
- Solo Vln.
- Solo Vla.
- Vln. I
- Vln. II
- Vla.
- Vc.
- Db.

The Solo Vln. part features a melodic line with triplets and slurs, marked *f*. The Solo Vla. part features a melodic line with triplets and slurs, marked *f*. The Bsn. I & 2, Con., and Db. parts feature sustained notes, marked *pp*. The Vln. I, Vln. II, Vla., and Vc. parts feature sustained notes.

=

16 Slightly faster $\text{♩} = 84$

Musical score for measures 32-35, tempo *Slightly faster* $\text{♩} = 84$. The score includes parts for:

- Bsn. I & 2
- Con.
- Vln. I
- Vln. II
- Vla.
- Vc.
- Db.

The Bsn. I & 2, Con., Vln. I, Vln. II, Vla., Vc., and Db. parts feature rhythmic patterns, marked *f*. The Vln. I and Vln. II parts feature sustained notes.

17 Expressively, slower ♩ = 72

29

Musical score for measures 17-20. The score includes parts for Bsn. 1 & 2, Cbn., Solo Vln. (marked '(may not be audible)'), Solo Vla., Vln. I, Vln. II, Vla., Vc., and Db. The Solo Vln. part features a melodic line with a dynamic marking of *f* and a fermata. The other instruments provide harmonic support with sustained notes and rhythmic patterns.



Slightly faster ♩ = 84

Musical score for measures 21-24. The score includes parts for Bsn. 1 & 2, Cbn., C Tpt. 3 & 4, Tbn. 3, Solo Vla., Vln. I, Vln. II, Vla., Vc., and Db. The Solo Vln. part has a dynamic marking of *f*. The Vc. and Db. parts also feature dynamic markings of *f*. The tempo is marked 'Slightly faster ♩ = 84'.

18

stagger breathe

Fl. 1 & 2

stagger breathe

Fl. 3

stagger breathe

Ob.

stagger breathe

Cl. 1

stagger breathe

Cl. 2

stagger breathe

B. Cl.

Bsn. 1 & 2

Con.

C Tpt. 1 & 2

con sord.

C Tpt. 3 & 4

con sord.

Tbn. 1 & 2

con sord.

Tbn. 3

con sord.

B. Tbn.

con sord.

Solo Vla.

Vln. I

Vln. II

Vla.

Vcl.

Db.

p *mp* *mf*

stagger breathe

con sord.

con sord.

con sord.

con sord.

Fl. 1 & 2
Ob.
Cl. 1
Cl. 2
B. Cl.
Bsn. 1 & 2
Chn.
Hr. 1 & 3
Hr. 2 & 4
Perc. 1
Perc. 2
Vc.
Db.

Unmetered until figure 25
Each player moves through the boxes in their own time
Conductor will cut off at figure 25

mf

Unmetered until figure 25
Each player moves through the boxes in their own time
Conductor will cut off at figure 25

mf

Detailed description: This page of a musical score, numbered 21, contains 13 staves. The top section includes woodwind instruments: Flutes 1 & 2, Oboe, Clarinets 1 & 2, Bass Clarinet, Bassoons 1 & 2, and Contrabassoon. The middle section features Horns 1 & 3 and Horns 2 & 4. The bottom section includes Percussion 1 and Percussion 2, Violoncello (Vc.), and Double Bass (Db.). The score is divided into measures by vertical bar lines. A specific instruction is placed between the Percussion 1 and 2 staves, indicating that the music is unmetered until figure 25 and that each player moves through boxes in their own time. The conductor's cue is to cut off at figure 25. The dynamic marking *mf* (mezzo-forte) is indicated for the percussion parts.

accel.

This page contains a musical score for an orchestra, starting on page 34 of a larger work. The score is for measures 34 through 38. The instruments listed on the left are:

- Fl. 1 & 2 (Flutes)
- Ob. (Oboe)
- Cl. 1 (Clarinet 1)
- Cl. 2 (Clarinet 2)
- B. Cl. (Bass Clarinet)
- Bsn. 1 & 2 (Bassoons)
- Con. (Contrabassoon)
- Hr. 1 & 3 (Horns 1 & 3)
- Hr. 2 & 4 (Horns 2 & 4)
- Perc. 1 (Percussion 1)
- Perc. 2 (Percussion 2)
- Vln. I (Violin I)
- Vln. II (Violin II)
- Vla. (Viola)
- Vc. (Violoncello)
- Db. (Double Bass)

The score features a variety of musical notations, including rests, notes, and complex rhythmic patterns. A dynamic marking of *f* (forte) is present in the first measure of the Flute 1 & 2 part. The tempo marking *accel.* (accelerando) is located at the top right of the page. The percussion parts (Perc. 1 and Perc. 2) show rhythmic patterns with some notes enclosed in boxes. The string parts (Vln. I, Vln. II, Vla., Vc., Db.) have a consistent rhythmic accompaniment throughout the measures.

22 faster $\text{♩} = 92$
cut off upper strings

Fl. 1 & 2

Fl. 3 Piccolo

Ob.

Cl. 1

Cl. 2

B. Cl.

Bsn. 1 & 2

Cbn.

Hn. 1 & 3

Hn. 2 & 4

Perc. 1

Perc. 2

Vln. 1

Vla.

Vc.

Db.

Fl. 1 & 2
Picc.
Ob.
Cl. 1
Cl. 2
B. Cl.
Bsn. 1 & 2
Cbn.
Hr. 1 & 3
Hr. 2 & 4
B. Trb.
Trb.
Vln. I
Vln. II
Vla.
Vc.
Db.

musical score for page 36, featuring various instruments including Flutes, Piccolo, Oboe, Clarinets, Bassoons, Horns, Trumpets, Trombones, Violins, Viola, and Double Bass. The score is arranged in a standard orchestral layout with multiple staves for each instrument. The page number 36 is located at the top left, and the page number 40 is located at the top right. The score includes various musical notations such as notes, rests, and dynamic markings like *f* and *senza sord.*

Fl. 1 & 2

Picc.

Ob.

Cl. 1

Cl. 2

B. Cl.

Bsn. 1 & 2

Chn.

Hr. 1 & 3

Hr. 2 & 4

C Tpt. 1 & 2

C Tpt. 3 & 4

Tbn. 1 & 2

Tbn. 3

B. Tbn.

Tbn.

Perc. 1

Perc. 2

Vln. I

Vln. II

Vla.

Vcl.

Db.

f

senza sord.

2.

accl.

Fl. 1 & 2
Picc.
Ob.
Cl. 1
Cl. 2
B. Cl.
Bsn. 1 & 2
Cbn.
Hr. 1 & 3
Hr. 2 & 4
C Tpt. 1 & 2
C Tpt. 3 & 4
Tbn. 1 & 2
Tbn. 3
Tbn. 4
Perc. 1
Perc. 2
Vln. I
Vln. II
Vla.
Vcl.
Db.

divisi

(Bass Drum)

(Large no cym)

24 faster $\text{♩} = 108$

Musical score for measures 24-26. The score is for a full orchestra, including Flutes (Fl. I & 2), Piccolo (Picc.), Oboe (Ob.), Clarinet (Cl.), Violins (Vln. I & II), and Viola (Vla.). The tempo is marked "faster" with a quarter note equal to 108 beats per minute. The dynamics are marked "p" (piano). The music features complex rhythmic patterns with many triplets and sixteenth notes. The key signature has one flat (B-flat).

≡

accel.

Musical score for measures 27-29. The score is for a full orchestra, including Flutes (Fl. I & 2), Piccolo (Picc.), Oboe (Ob.), Clarinet (Cl.), Violins (Vln. I & II), and Viola (Vla.). The tempo is marked "accel." (accelerando). The dynamics are not explicitly marked in this section. The music continues with complex rhythmic patterns, including triplets and sixteenth notes. The key signature has one flat (B-flat).

25 ♩ = 108

This page of a musical score, rehearsal mark 25, features a tempo of 108 beats per minute. The score is arranged in a standard orchestral format with the following parts:

- Flutes:** Fl. 1 & 2
- Piccolo:** Picc.
- Oboe:** Ob.
- Clarinets:** Cl. 1, Cl. 2
- Bassoon:** B. Cl.
- Contrabass:** Conb.
- Horns:** Hn. 1 & 3, Hn. 2 & 4
- Trumpets:** C Tpt. 1 & 2, C Tpt. 3 & 4
- Trombones:** Tbn. 1 & 2, Tbn. 3, B. Tbn., Tbn.
- Percussion:** Perc. 1 (with sub-parts for *snm drum*, *woodblock*, *large tom cym*, and *snare drum*), Perc. 2
- Strings:** Vln. I, Vln. II, Vla., Vcl., Db.

The score is written in 4/4 time and includes various musical notations such as dynamics (e.g., *f*, *mf*), articulation, and performance instructions. The percussion parts are particularly detailed with specific instrument markings.

Fl. 1 & 2

Fl. 3

Ob.

Cl. 1

Cl. 2

B. Cl.

Bsn. 1 & 2

Con.

Perc. 1

Perc. 2

Vln. I

Vln. II

Vla.

Vc.

Db.

26 ♩ = 108

Fl. I & II
mp

Picc.
mp

Ob.
mp

Cl. I
mp

Cl. II
mp

B. Cl.
mp

Bsn. I & II
mp

Vln. I
mp

Vln. II
mp

Vla.
mp

Vcl.
mp

accel. 27 ♩ = 108 43

Fl. 1 & 2
Picc.
Ob.
Cl. 1
Cl. 2
B. Cl.
Bsn. 1 & 2
Cbn.
Hn. 1 & 3
Hn. 2 & 4
C Tpt. 1 & 2
C Tpt. 3 & 4
Tbn. 1 & 2
Tbn. 3
B. Tbn.
Tbn.
Perc. 1 (Bass Drum, woodblock)
Perc. 2 (Large tom tom, snare drum)
Vln. I
Vln. II
Vla.
Vc.
Db.

This page of a musical score, page 44, contains the following instruments and parts:

- Fl. 1 & 2
- Picc.
- Ob.
- Cl. 1
- Cl. 2
- B. Cl.
- Bsn. 1 & 2
- Chm.
- Hr. 1 & 3
- Hr. 2 & 4
- C. Tpt. 1 & 2
- C. Tpt. 3 & 4
- Tbn. 1 & 2
- Tbn. 3
- B. Tbn.
- Tbn.
- Perc. 1 (Non Trem)
- Perc. 2 (Large en cym)
- Vln. I
- Vln. II
- Vla.
- Vcl.
- Dbl.

The score includes various musical notations such as notes, rests, and slurs. Dynamics are marked with *ff*. Performance instructions include *Non Trem* and *Large en cym*. The page number 44 is located in the top left corner, and the page number 49 is in the top right corner.

Portals

Portals

written for the Silencio Ensemble

Pieta Hextall

Portal #1

8

A Slow $J = 60$
a batuta

Flute

Clarinet in Bb

Soprano Saxophone

Alto Saxophone

Bassoon

Trumpet in Bb

Percussion

Soprano Solo

Violoncello

Double Bass

Improvised bass line using this scale

B

unmetered - ad libitum
e.50s

repeat this section until cue for B
on each repeat ornament (note given for guidelines) and stretch rhythm more
do not play in time with soprano solo

repeat this section until cue
on each repeat ornament (note given for guidelines) and stretch rhythm more
do not play in time with soprano solo

repeat this section until cue
on each repeat ornament (note given for guidelines) and stretch rhythm more
do not play in time with soprano solo

TACET FOR FIG B
wait for cue for FIG C

TACET FOR FIG B
wait for cue for FIG C

TACET FOR FIG B
wait for cue for FIG C

TACET FOR FIG B
wait for cue for FIG C

TACET FOR FIG B
wait for cue for FIG C

TACET FOR FIG B
wait for cue for FIG C

TACET FOR FIG B
wait for cue for FIG C

unmetered - ad libitum
e.50s

TACET FOR FIG B
wait for cue for FIG C

Fl

Cl

Sop. Sax.

Alto Sax.

Bsn.

Tpt.

Perc.

S. Solo.

Va.

Db.

6

C

Fl.

Cl.

Sop. Sax.

Alto Sax.

Bsn.

Tpt.

Perc.

S. Solo

Va.

Db.

repeat this section until cue
on each repeat ornament (make given for guidelines) and stretch rhythm more
do not play in time with soprano sax

repeat this section until cue
on each repeat ornament (make given for guidelines) and stretch rhythm more
do not play in time with soprano sax

repeat this section until cue
on each repeat ornament (make given for guidelines) and stretch rhythm more
do not play in time with soprano sax

repeat this section until cue
on each repeat ornament (make given for guidelines) and stretch rhythm more
do not play in time with soprano sax

TACET FOR PIG C
wait for cue for Pig D

triangle

triangle

TACET FOR PIG C
wait for cue for Pig D

repeat this section until cue
on each repeat ornament (make given for guidelines)
and stretch rhythm
do not play in time with soprano sax
start at tempo
after the triangle cue

improvises bass line
using this scale

||

D

Fl.

Cl.

Sop. Sax.

Alto Sax.

Bsn.

Tpt.

Perc.

S. Solo

Va.

Db.

repeat this section until cue
on each repeat ornament (make given for guidelines)
and stretch rhythm more
do not play in time with soprano sax

triangle

repeat this section until cue
on each repeat ornament (make given for guidelines)
and stretch rhythm more
do not play in time with soprano sax

Ah

Ah

D

Ⓜ a batuta but free

7

Fl.

Cl.

Sop. Sax.

Alto Sax.

Bsn.

Tpt.

Perc.

S. Solo

Va.

Db.

fl. cymbal triangle

f *p*

hum

p

Ⓜ a batuta but free

p *ff*

Portal #2

A Slow $\text{♩} = 62$
a battuta

Flute *pp cresc. poco a poco*

Clarinet 1 in Bb *pp cresc. poco a poco*

Clarinet 2 in Bb

Soprano Saxophone

Tenor Saxophone *pp cresc. poco a poco*
add over these notes
treat each box as a short and move through them however you wish

Bassoon *p cresc. poco a poco*

Trumpet in Bb

Violoncello *pp cresc. poco a poco*

Double Bass *pp cresc. poco a poco*

Fl. *mf*

Cl. 1 *mf*

Cl. 2 *p cresc. poco a poco* *mf*

Sop. Sax. *p cresc. poco a poco* *mf*

Ten. Sax. *mf*

Bsn. *mf*

Trpt.

Va. *mf*

Db. *mf*

B conductor cue

Fl. *mp cresc. poco a poco*

Cl. 1 *mp cresc. poco a poco*

Cl. 2 *mp cresc. poco a poco*

Sop. Sax. *mp cresc. poco a poco*

Ten. Sax. *mp cresc. poco a poco*

Bsn. *mp cresc. poco a poco*

*slur over these notes
treat each box as a chord and move through them however you wish*

Trp. *mp cresc. poco a poco*

Vc. *mp cresc. poco a poco*

Db. *mp cresc. poco a poco*



Slower $\downarrow = 42$
metered but free

C

Fl. *ff* *f* *mf* *mp* *p* *pp*

Cl. 1 *ff* *f* *mf* *mp* *p* *pp*

Cl. 2 *ff* *f* *mf* *mp* *p* *pp*

Sop. Sax. *ff* *f* *mf* *mp* *p* *pp*

Ten. Sax. *ff* *f* *mf* *mp* *p* *pp*

Bsn. *ff* *f* *mf* *mp* *p* *pp*

Trp. *ff* *f* *mf* *mp* *p* *pp*

Vc. *ff* *f* *mf* *mp* *p* *pp*

Db. *ff* *f* *mf* *mp* *p* *pp*

Portal #3

A $\text{♩} = 42$ **unmetered**
TACTE UNTIL FIG 3
Conductor will give downbeat at D

Flute

Clarinet in B \flat

Alto Saxophone 1

Alto Saxophone 2

Tenor Saxophone

Bassoon

Trumpet in B \flat

Piano
 strum inside piano if possible
 otherwise do something of a similar effect

plucked inside the piano
 if possible

Soprano Solo
 $\text{♩} = 42$ **unmetered**

A

Violoncello

Double Bass

Pno. *l.v.* strum

B

Pno.

S. Solo *P*
 enter when piano returns to strumming

Je - - - su re demp - - - - - tor su - - - sol - - -

C head weather report
 (on separate sheet)

Bsn.

S. Solo
 pe li - - - - - lam

WEATHER REPORT

In the west from Northland to Wellington, and the central high country - Fine at first. Isolated showers from Taranaki to Wellington tonight, spreading elsewhere later tomorrow.

Bay of Plenty, and Gisborne to Wairarapa - Mostly fine, however isolated showers about coastal Gisborne clearing this afternoon.

Buller, Westland - A few showers for Buller, spreading to Westland tonight. A period of rain spreading north tomorrow, with brief heavy and thundery falls for Westland.

Fiordland, Southland - Rain developing overnight, with heavy falls for Fiordland. Easing to showers tomorrow morning, some heavy and thundery with hail tomorrow afternoon.

Nelson, Marlborough, Canterbury - Mainly fine, however rain about the Alps tomorrow and isolated showers spreading elsewhere tomorrow afternoon or evening.

Otago - Fine today. Showers developing tomorrow morning, possibly heavy in the east tomorrow afternoon. Clearing after dark.

Kaitia - Cloudy at times. Southwesterlies. high 19 °C

Whangarei - Long fine spells. Southwesterlies. high 19 °C

Auckland - Cloudy at times. Southwesterlies. high 18 °C

Tauranga - Fine. Westerly winds. high 18 °C

Hamilton - Cloudy at times. Westerlies. high 18 °C

Rotorua - Fine. Westerly winds. high 16 °C

Taumarunui - Cloudy at times. Westerlies. high 17 °C

Taupo - Cloudy at times. Westerlies. high 16 °C

New Plymouth - Mostly cloudy, evening showers. Westerlies. high 17 °C

Gisborne - Fine. Sea breezes. high 19 °C

Napier - Fine. Northwesterlies developing. high 20 °C

Hastings - Fine. Northwesterlies developing. high 19 °C

Masterton - Fine. Northwesterlies freshening. high 18 °C

Palmerston North - Often cloudy, showers at night. Northwest freshening. high 17 °C

Wanganui - Mostly cloudy, evening showers. Northwest freshening. high 17 °C

Levin - Often cloudy, showers at night. Northwesterlies. high 16 °C

Paraparaumu - Often cloudy, showers at night. Freshening northerly. high 16 °C

Wellington - Mostly cloudy. Late showers. Northerly strengthening. high 16 °C

4

D

Slow ♩ = 52 poco a poco accel.
A battuta
Conductor will give down beat

Fl. *p* *mp* *mf* *f*

Cl. *p legato* *mp* *mf* *f*

Alto Sax. 1 *pp* *swing*

S. Solo *p* *mp* *mf* *f*
A - ni - mam e - - - - - lus In pa - ra - di - - -

D

Slow ♩ = 52 poco a poco accel.
A battuta
Conductor will give down beat

Vc. *p legato* *mp* *mf* *f*

Db. *f*

≡

Fl. *mp*

Cl. *mp* *p*

Alto Sax. 1 *mp*

Alto Sax. 2 *swing* *pp* *mp*

Ten. Sax. *swing* *pp* *mp*

S. Solo *mp* *p*
so. Je - - - - - su re -

Vc. *mp* *p*

Db. *mp* *p* *scordano*

molto accel.



Moderate blues tempo
follow Double Bass

$\text{♩} = 72$

8

Fl.

Cl.

Alto Sax. 1
mf

Alto Sax. 2
mf

Ten. Sax.
mf

Ben.

Tpt.
C⁷ solo F⁷ C⁷ F⁷ C⁷

Pno. II
stop strumming

B. Solo
dep. tor.

Moderate blues tempo
follow Double Bass



$\text{♩} = 72$

Vc.

Db.
pizz. *f* in the style of Louis Bottarbo



Alto Sax. 1

Alto Sax. 2

Ten. Sax.

Ben.

Tpt.
Dm⁷ G⁷ C⁷ C⁷ F⁷ C⁷

Vc.

Db.
Cm⁷ F⁷ Bb⁷ Bb⁷ Bb⁷ Bb⁷

6

Musical score for Alto Sax 1, Alto Sax 2, Tenor Sax, Bass, Trumpet, and Double Bass. The score is in 4/4 time and features a key signature of one flat. The Alto Sax 1, 2, and Tenor Sax parts play a melodic line with a dynamic marking of *mf*. The Bass part is mostly silent. The Trumpet part has a series of 'X' marks, indicating a muted or silent part. The Double Bass part plays a bass line with a dynamic marking of *f*. Chord symbols are provided for the Trumpet and Double Bass parts.

==

Musical score for Flute, Clarinet, Alto Sax 1, Alto Sax 2, Tenor Sax, Bass, Trumpet, and Double Bass. The score is in 4/4 time and features a key signature of one flat. A section marked with a circled 'F' begins. The Flute and Clarinet parts play a melodic line with a dynamic marking of *pp*. The Alto Sax 1, 2, and Tenor Sax parts play a melodic line with a dynamic marking of *pp*. The Bass part plays a bass line with a dynamic marking of *pp*. The Trumpet part has a series of 'X' marks, indicating a muted or silent part. The Double Bass part plays a bass line with a dynamic marking of *pp*. Chord symbols are provided for the Trumpet and Double Bass parts.

G
4/4
Slower $\text{♩} = 72$
metered but relaxed

Fl. *mp*

Cl. *mp*

Bsn. *mp*

Tpt. *(mp)*

Pno. *strum*

Va. *mp*

Db. *(mp)*



Fl. *mf*

Cl. *mf*

Bsn. *mf* *f*

Tpt. *f*

Pno.

Va. *mf* *f*

Db. *mf* *f*

8

H

Fl. *f*

Cl. *f*

Alto Sax. 1 *f*

Alto Sax. 2 *f*

Ten. Sax. *mf*

Ben. *mf*

Trpt. *Bb7 Cm7 F7*

Pno. *p mp*

S. Solo. *p mp*
A . . . ni . mam e . . .

H

Vc. *p*

Db. *Bb7 Cm7 F7*

Fl. *mf*

Cl. *mf*

Alto Sax. 1 *mf*

Alto Sax. 2 *mf*

Ten. Sax. *p*

Ben. *p*

Trpt. *Bb7*

Pno. *mf f*

S. Solo. *mf f*
lus In pa . . .

Vc. *mf p*

Db. *Bb7*

Fl.

Cl.

Alto Sax. 1

Alto Sax. 2

Ten. Sax.

Bsn.

Tpt.

Pno.

S. Solo

Vc.

Db.

pp

p

pp

pp

pp

pp

pp

mp

pp

ra - - - di - - - so.

Portal #4

A **Metered, Fast** $\text{♩} = 160$

Flute *f*

Clarinet 1 in Bb *f*

Clarinet 2 in Bb *f*

Clarinet 3 in Bb *f*

Soprano Saxophone *f*

Bassoon *f*

Trumpet in Bb *f*

Percussion

Violoncello *f*

Double Bass *f*

Fl.

Cl. 1

Cl. 2

Cl. 3

Sop. Sax.

Bsn.

Tpt.

Perc.

Vc.

Db.

Fl.
Cl. 1
Cl. 2
Cl. 3
Sop. Sax.
Bsn.
Tpt.
Perc.
Vc.
Db.

unmetered
enter on 1st triangle cue. Repeat box until next triangle cue.
♩ = c. 98-108

C
Fl. *p poco a poco cresc.*
Cl. 1 *p poco a poco cresc.*
Cl. 2 *p poco a poco cresc.*
Cl. 3 *p poco a poco cresc.*
Sop. Sax. *p poco a poco cresc.*
Bsn. *p poco a poco cresc.*
Tpt. *p poco a poco cresc.*
Perc. triangle
Vc. *p poco a poco cresc.*
Db. *p poco a poco cresc.*

D a battuta but free

Fl.

Cl. 1

Cl. 2

Cl. 3

Sop. Sax.

Bsn.

Tpt.

Perc.

Vc.

Db.

triangle

mf

p

Seven Point Zero

Seven Point Zero

trio for flute, clarinet and bassoon

transposed score

Pieta Hextall

Play the modules in any order and continue to play through them until flute cue

The musical score consists of three systems, each with three staves: Flute (top), Clarinet in Bb (middle), and Bassoon (bottom).
System 1:
- Flute: Starts with a box labeled 'A' containing a whole rest (w.t.) and a dynamic marking of *pp*. A second box contains a half note G4 with a dynamic marking of *p*.
- Clarinet in Bb: Two boxes labeled 'subtone' with a dynamic marking of *pp*.
- Bassoon: A box labeled 'tacet for this module'.
System 2:
- Flute: A box containing four whole notes (G4, A4, B4, C5) with a dynamic marking of *p*.
- Clarinet in Bb: A box with a dynamic marking of *p* and a box with a dynamic marking of *p* and a slur over a sixteenth-note figure.
- Bassoon: A box with a dynamic marking of *fp* and a slur over a half note, and a box with a dynamic marking of *p* and a slur over a half note.
System 3:
- Flute: A box with a dynamic marking of *mf* and a slur over a sixteenth-note figure, with a box above it labeled 'flute signal'.
- Clarinet in Bb: A box with a slur over a half note.
- Bassoon: A box with a dynamic marking of *fp* and a slur over a half note, and a box with a dynamic marking of *p* and a slur over a half note.

4 **B**

$\text{♩} = 36$

p *mf* *p* *mp cresc.*

play 8vb if necessary

mf cresc. *f* *mf cresc.* *f* *tr* *flz.*

f *fix*

System 1 of a musical score. It consists of three staves. The top staff is in treble clef and contains a complex melodic line with a large slur and a '5' below it. The middle staff is in treble clef and contains a series of chords with a '3' below each. The bottom staff is in bass clef and contains a bass line with a '5' below it.

System 2 of a musical score. It consists of three staves. The top staff is in treble clef and contains a melodic line with a '3' below it. The middle staff is in treble clef and contains a bass line with a '5' below it. The bottom staff is in bass clef and contains a bass line with a '3' below it.

System 3 of a musical score. It consists of three staves. The top staff is in treble clef and contains a melodic line with a '7' below it. The middle staff is in treble clef and contains a bass line with a '5' below it. The bottom staff is in bass clef and contains a bass line with a '5' and a '3' below it.

Musical score for three staves (treble, alto, bass). The top staff features a melodic line with triplets. The middle staff has a melodic line with triplets and a quintuplet. The bottom staff has a melodic line with a quintuplet. The dynamic marking *fff* is present at the end of the first measure of each staff.

Play the modules in any order and repeat until flute cue

Loud and chaotic

A collection of musical modules for flute, alto, and bass. The modules are arranged in a grid-like fashion. The top row includes a 'jet whistle' module with a dynamic marking of *sempre fff*. The middle row features a module with a dynamic marking of *sempre fff* and another with a dynamic marking of *sempre fff*. The bottom row includes a module with a dynamic marking of *sempre fff* and another with a dynamic marking of *sempre fff*. The modules contain various rhythmic patterns, including triplets, quintuplets, and melodic lines.

5

clarinet signal

D Grave $\text{♩} = 36$

pp — *p* *pp* — *mp* *pp* — *mf*

pp — *p* *pp* — *mp* *pp* — *mf*

pp — *p* *pp* — *mp* *pp* — *mf*

E poco accel.

f *mp* — *f* *mf* — *f* *pp* cresc. poco a poco

f *mp* — *f* *mf* — *f* *pp* cresc. poco a poco

f *mp* — *f* *mf* — *f*

Musical score for the first system, measures 1-5. The score is written for three staves: Treble Clef (top), Treble Clef (middle), and Bass Clef (bottom). The top staff contains a melodic line with a half note, a quarter note, and a triplet of eighth notes. The middle staff contains a rhythmic accompaniment of eighth notes. The bottom staff is mostly empty.

Musical score for the second system, measures 6-10, marked with a box containing the letter 'F'. The score is written for three staves. The top staff features a melodic line with a triplet of eighth notes and a crescendo marking *f cresc.*. The middle staff has a rhythmic accompaniment with a crescendo marking *f cresc.*. The bottom staff contains bass notes with dynamic markings *sfz* and accents.

Musical score for the third system, measures 11-14, marked with a box containing the letter 'G'. The tempo is marked *Tempo I* with a quarter note equal to 36. The score is written for three staves. The top staff has a melodic line with dynamic markings *p* and *mp*. The middle staff has a rhythmic accompaniment with a dynamic marking *p*. The bottom staff contains bass notes with dynamic markings *sfz* and *p*.

H

Treble staff: *p*, *mp*, *mf*
 Bass staff: *mp*, *p*, *mp*, *mf*
 Bass staff: *p*, *mp*, *mf*

I

Treble staff: *f*, *ff*, *pp* (w.t.)
 Bass staff: *f*, *ff*, *pp* (subtone)
 Bass staff: *f*, *ff*

Treble staff: *pp*
 Bass staff: *pp*
 Bass staff: *pp*

Track Listings

CD 1:

Track 1: **Seven Point Zero**

Luca Manghi, Anna McGregor and Ben Hoadley. Performed at New Zealand Music for Woodwinds 2010. Recorded by Radio New Zealand, March 2010.

Track 2: **Seven Point Zero**

Lucy Anderson (fl), Gretchen Dunsmore (cl) and Kylie Nesbit (bsn). Workshopped at the Nelson Composers Workshop 2010. Recorded by Michael Parsons at the Nelson School of Music, July 2010.

Track 3: **Our Own Demise**

Karlo Margetić (cond.); for a full list of performers please refer to the acknowledgements page in the exegesis. Recorded by Ben Woods and Jack Hooker in the Adam Concert Room, Wellington, June 2011.

Track 4-7: **Portals #1-4**

Olga Gryniewicz (sop), Brendan O'Donnell (rec), Tui Clarke (cl), Hayden Hockley (sax), Reuben Chin (sax), Nick Walshe (cl/sax), Hayley Roud (bsn), Ben Hunt (tpt), Scott Maynard (db), Kieran Burns (misc), Pieta Hextall (cond). Recorded by Kieran Burns in Room 209, NZSM, June 2011. Edited by Ben Woods.

Track 8: **Portals #2 and #3**

Silencio Ensemble, Chris Reddington (cond). Performed in 8, part of the Platform Arts Festival 2010. Recorded in the Great Hall, Arts Centre, Christchurch, 25 May 2010.

CD 2:

Track 1-2: **Portal #1**

Track 3-4: **Portal #2**

Track 5-6: **Portal #3**

Track 7-8: **Portal #4**

All tracks are recordings of the rehearsals of the Silencio Ensemble. Presented in order to illustrate the differences between performances of aleatory works.

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Introduction

The term “aleatoricism” is derived from the Latin word for dice¹. When used in the context of twentieth-century art music it refers to the introduction of chance elements by the composer into the work, allowing performers to make more or less circumscribed contributions to and decisions about how the piece will unfold. Aleatoricism in Western art music emerged partly out of the desire among some composers to create more open forms that could accommodate a certain degree of improvisation.² Aleatoricism can be seen in some ways as a fundamental challenge to the traditional concept of the integrity of the “work” in which the composer is seen as determining every aspect of its constitution (with John Cage’s *4’33”* being perhaps the most extreme example of that challenge). On the other hand, as some composers have demonstrated, aleatory elements may be introduced simply as a way to create particular kinds of textures that would be extremely difficult, if not impossible, to notate otherwise. In those instances, aleatoricism can be understood as simply another element in the composer’s creative arsenal, but one that does not necessarily challenge in any significant sense the traditional concept of the work. In this thesis I will explore some of these uses of aleatoricism as a compositional technique with specific reference to the music of Polish composer Witold Lutosławski and myself, making particular reference to works included in the accompanying composition portfolio. This paper will raise questions and issues pertinent to the use of

¹ Whittall, A. (2007-2009). *Aleatory Music*. Retrieved 06 30, 2011 from Oxford Music Online: <http://www.oxfordmusiconline.com/80/subscriber/article/opr/t114/e164>

² Griffiths, P. (2007-2009). Aleatory. *Oxford Music Online*. Retrieved 06 30, 2011 from Oxford Music Online: <http://www.oxfordmusiconline.com/80/subscriber/article/grove/music/00509>

aleatoricism, and explore the ways in which the two composers have attempted to address these issues.

The first chapter discusses aleatoricism in the greater context of indeterminate music. Aleatoricism flourished in the 1960s, and is generally considered the European branch of indeterminate music, differing greatly from the approach of composers in America such as John Cage. In this section aleatory music is formally defined and the reasons for the choice for the study of this branch of composition are explained. The second chapter discusses aleatoricism in the broader genre of textural composition, where aleatoricism is compared with and contrasted to other techniques in the same field, specifically the micropolyphony of György Ligeti and the stochastic approach of Iannis Xenakis.

The third chapter focuses on the use of form and structure in Lutosławski's aleatory music. The use of macrorhythm in the structures of Lutosławski's works is crucial to the trajectory of the work, particularly in the movement towards and away from the climax. He uses pitch organisation to assist in the trajectory as well as to create tension and release. The study of these formal approaches is instructive to composers working with indeterminate elements.

The fourth section discusses issues in aleatory composition. As with any compositional approach, aleatoricism has both advantages and disadvantages, and it raises issues in the compositional, practical and performative domains. Compositional issues include, but are not limited to, the creation of a cohesive and dynamic form/structure, the use of macrorhythm, orchestration, registral spectrum, dynamics

and pitch, the ease of generation of material and the ease of creating easily realised complex textures. On a practical level, the creation of scores and parts causes particular difficulty especially when using notation software. Alongside this, the composer must consider the use of cues, conductor(s), signals and modules in order to create a realisation that matches the composers' intentions and conception. The last of the practical issues for the composer to consider is the portability of the work. If the composer is required to be present during the rehearsal process then the chance of performances of the piece dramatically reduces. Finally, the discussion of performative issues deals with the new role of the performer as they make creative decisions during the performance process given the addition of chance elements and—in the case of my composition—improvisation. The necessary forfeiture of control, to allow performers to make creative decisions in the realisation of the work, can, however, be a psychological barrier for many composers. In my works I allow the performers to make a number of decisions that affect the outcome, particularly in *Portals*, where the performers have a greater amount of flexibility than in the other two study works or the works of Lutosławski.

To discover solutions for the above issues I shall analyse three works by Lutosławski. The works that have been chosen deal with very different ensembles. The variety permits a clear picture of possible solutions. The first of the three pieces, *Jeux Vénitiens* (1960–1), is written for full symphony orchestra and was the first work in which Lutosławski used aleatory technique. The second piece, *Trois Poèmes d'Henri Michaux* (1961), is scored for twenty solo voices and a large ensemble consisting of ten woodwind, six brass, two pianos, harp and four percussionists (with a large number of instruments). The third piece, *String Quartet* (1964), has the most extreme

use of aleatory technique in Lutosławski's *oeuvre* (aside from potentially his Symphony No. 3).

The last chapter discusses the accompanying portfolio of compositions. They include three works: *Seven Point Zero*, *Portals* and *Our Own Demise*. Following the analysis of Lutosławski's works, I analyse and discuss my own works. To mirror the range in Lutosławski's size and instrumentation of his ensembles, I have written a piece for symphony orchestra (*Our Own Demise*), a piece for large chamber ensemble (*Portals*), and a piece for wind trio (*Seven Point Zero*). My works use aleatory technique to differing degrees and while composing them I had to confront the compositional, practical and performance issues outlined above. In this chapter these works will be analysed and discussed with particular reference to the use of aleatoricism, and its relationship to that seen in Lutosławski's compositional approach. By analysing and discussing these works, I will demonstrate my own solutions to these problems, while acknowledging the existence of other potential solutions.

Aleatoricism

The terms *aleatory*, *indeterminate*, and *chance music* have loose definitions that vary from composer to composer. In the 1950s, chance music emerged in both the European and American avant-garde. 'Chance music' is music in which there is some element of chance in either the compositional process or the performance process. The European school headed in the direction of 'controlled chance' or 'aleatory music', while the American school gravitated towards 'pure chance' or 'indeterminate music'. Both schools use chance techniques but have entirely different approaches and philosophies.

Indeterminate music is music that has had chance techniques applied during the compositional process. John Cage and his contemporaries in America pursued this path. Although they introduced chance into their compositions, they were less willing to hand over control to the performers. They used chance procedures in their compositional processes such as I Ching charts, dice throws, coins tosses and mathematical laws of chance.

Aleatory music, on the other hand, involves the use of chance elements in the realisation of the work (the performance). The term *aleatory* comes from the Latin word 'alea', meaning dice. Thus aleatory music uses chance procedures in which there are a limited number of possibilities. If the musical elements themselves were random or undefined they could not be put into aleatory combinations (one cannot play dice if the dice are unnumbered). Usually some element of the composition is left to the determination of the performer(s), whether it is pitch, rhythm, form, sound

material, or expression. The composer will give either written instructions or musical examples to assist the performer in realising the work.

The term *aleatory* became popular in the 1950s, after acoustician Werner Meyer-Eppeler gave a series of lectures at Darmstadt. He stated ‘a process is said to be aleatoric...if its course is determined in general but depends on chance in detail’³. The description fits the European school as the European composers had a much more difficult time accepting chance elements in their compositional process than American composers did. For many European composers, music still had to have formal elements. Pierre Boulez and Karlheinz Stockhausen, two of the first European composers to employ the use of chance techniques, developed aleatory methods within strictly defined parameters. This set the tone for the aleatory school of chance in Europe from which composers such as Witold Lutosławski and Krzysztof Penderecki drew inspiration. In short, indeterminate music uses chance procedures during the compositional process and aleatory music uses chance procedures during the performance process.

I have chosen to focus on and analyse the aleatory technique of Lutosławski for a number of reasons. Firstly, he utilised controlled aleatoricism in order to retain control over every aspect of the compositional and performance processes, with the exception of ensemble coordination. The effect of aleatoricism depends on the way and the extent it is used. Aleatoricism allows performers to contribute both to the performance and to the compositional processes, even as the composer maintains control and ownership of the work. The performers interpret their parts and have

³ Meyer-Eppeler, W. 1957. *Statistic and Psychologic Problems of Sound*, translated by Alexander Goehr. Die Reihe 1 (*Electronic Music*): 55-61. Original German edition, 1955, as *Statistische und psychologische Klandprobleme*, Die Reihe 1 (*Elektronische Musik*): 22-28, p. 55

control over some micro-details. However, nothing they can do should disrupt the macrodetail of the work (unless, of course, the composer desires it). No two performances are the same; nor are they appreciably different. The composer retains control of the work and performers are able to shape the work in their own interpretation more so than in fixed works (although this differs from work to work and from style to style).

Second, the performers achieve a closer musical relationship with the work than they might with other recent styles of composition. When less rehearsal time is spent on ensemble coordination and the performance of complex rhythms, the performers are more readily able to focus on the musical interpretation of the work. The issue is not just one of the performers' relationships with the work but also one of rehearsal time and the ease of creating complex textures. Even if the performers are familiar with the style and the realisation of complex rhythms, time needed for rehearsal must in part be spent on the ensemble coordination in order to realise the complex rhythms as an ensemble.

Third, aleatoricism allows the composer to celebrate the expressive qualities of human performers. If human performers are not required for a work then computers can be used, but whilst the work is written for human performers there is a chance, on some level, to collaborate with them. Allowing them some control over the work can be beneficial for both the composer and the performers, as with the additional input it may produce a more varied results from performer to performer, celebrating and emphasising the differences between performances.

Finally, aleatoricism need not impinge on the fundamental form or process of the work (unless the composer intentionally allows it). Complex rhythms can still be realised but through a much more approachable method. Though the rhythms will not be exactly the same for every performance, the overall effect of rhythmic complexity will be achieved at every performance.

Aleatory technique is not without its issues. There are three principal ones. First, there are musical issues that occur during the compositional process. The most salient issue is the creation of a coherent formal design when sections, especially sectional durations, have the potential to change each time they are performed. The approach to form at both micro- and macro-levels varies from composer to composer and depends on the type of aleatory procedures that have been applied to the work in question. For example, Lutosławski's structures are planned in such a way that, so long as the performers strictly follow all the directions he has given, there is no possible way for the form to differ from performance to performance, even though the sections may vary in length. The sections also provide a crucial trajectory through the work as a method of creating a goal-oriented form. Other composers, such as Pierre Boulez, apply aleatory procedures to the macrostructure of the work and thus allow the performers to determine the form of the work. Such composers must then find other means to create logical form. In general, composers so inclined must consider how they are to exercise and maintain compositional control over the resulting work (and its performance). As is the case with the special issue of form and structure, the answer differs from composer to composer and from work to work. Lutosławski writes very clear instructions to his performers communicating his intentions and

laying out the rules of his aleatory *ad libitum* sections. Lutosławski resolved this issue through a clear and consistent approach to the notation of aleatory sections.

Secondly, a composer must deal with pragmatic issues. These include the lack of established conventions for aleatoric notation, the need for new notation, and ensemble coordination. Although the use of improvisation is not a new phenomenon in Western music, it has previously always taken place within styles guided by metric and harmonic and melodic conventions. Being relatively new, aleatory technique does not have a set of conventions that pertain from work to work and it is unlikely that it ever will. Composers establish their own set of rules for each work. The lack of longevity of aleatoricism also means that few conventions of notation have evolved, particularly in the 1960s. Notation, especially in the twentieth century, has caused composers constant difficulty and frustration⁴. Although it is actually quite efficient for pitch and rhythm, it does not deal with the emancipation of different musical parameters in the twentieth century. As expected, some forms of aleatory notation have been standardised since the 1960s. Some composers use graphic scores; others use mobiles, modules and written text instructions. Lutosławski used notation to provide his conductor with cues for the ensemble, communicating the beginnings and ends of sections. Aside from these, he also used musical signals to communicate with the performers as to what follows.

Aleatory music as a subject has not been widely covered in English literature. As a movement in the 1960s avant-garde, it is mentioned in general music history books

⁴ Brown, E. (1986). The Notation and Performance of New Music. *The Musical Quarterly*, 72 (2), 180-201, p. 188

such as the *Oxford History of Western Music* (Taruskin)⁵ and *A History of Western Music* (Grout and Palisca)⁶ under the more general term ‘indeterminacy’. Grout and Palisca provide a brief historical and aesthetic discussion on both the European and American schools. Grove Music Online offers an article entitled ‘Aleatory’ by Paul Griffiths⁷, a British music critic. He examines the historical contexts and aesthetics of both schools, as well as including a discussion of indeterminate notation. He also states, however, that ‘...after an explosion of interest in the late 1960s, coinciding with a revolutionary period in Western culture generally, aleatory music became a dead or dormant issue’⁸. It is certainly true that during the 1960s, aleatory composition grew popular and many composers experimented with it. However, his claim that aleatory music is a dead or dormant issue is certainly not the case. When discussing the use of aleatory elements in composition with other New Zealand composers, most use or have used, aleatoricism in their music. The use of aleatoricism does not have to constitute a complete compositional approach—it can be used merely as a device to achieve a particular texture or soundscape at certain points within an otherwise fully notated composition. While not all composers use aleatoricism as an approach, those who do are often attracted to its collaborative nature. Depending on the degree of use of aleatory technique, the interaction between the composer and performer heightens as the performer is involved in the creative process.

Despite the numerous discussions on aleatoricism, most come from the point of view of a musicologist rather than a composer or performer. For that reason, historical and

⁵ Griffiths, P. (n.d.). Aleatory. *Oxford Music Online*. Retrieved 06 30, 2011 from Grove Music Online: <http://www.oxfordmusiconline.com/subscriber/article/grove/music/00509>

⁶ Grout, D. J., & Palisca, C. V. (1996). *A History of Western Music* (5th ed.). New York: W. W. Norton.

⁷ Griffiths, P. (n.d.). Aleatory. *Oxford Music Online*. Retrieved 06 30, 2011 from Grove Music Online: <http://www.oxfordmusiconline.com/subscriber/article/grove/music/00509>

⁸ Taruskin, R. (2005). *The Oxford History of Western Music*. New York: Oxford University Press.

aesthetic discussions are more prevalent. Literature on aleatoricism from the composer's point of view is somewhat limited to recorded conversations with the composers and their writings. *Lutosławski on Music*⁹ is an invaluable collection of Lutosławski's writings, including scripts of lectures and interviews. This book provides insight into the workings of a composer who innovated new techniques through his interest in aleatoricism. In a similar vein, Irina Nikolska's *Conversations with Witold Lutosławski*¹⁰ provides similar insights revealing Lutosławski's approach to form, symphonic thinking, harmony and aleatoricism.

Aside from conversations with the composer and their writings, perhaps the leading essay on aleatoricism is Boulez's manifesto 'Aleatory'¹¹; in this article he discusses both aesthetic and compositional issues. Boulez finds fault with both the music of the integral serialists and the use of total chance, referring to both as a 'constant refusal of choice'¹². Instead he suggests a happy medium, aleatoricism, claiming that 'it seems to resolve the dilemma between strict interpretation and free interpretation'¹³. He has a perceptive view on the compositional difficulties that arise when using aleatoricism, discussing in great detail the importance of structure and form. This mirrors the experience that Lutosławski had when composing his aleatory music. He too, understood that in order to make sense of the sectional nature of aleatoricism, the structure is of key importance. Boulez suggests the use of musical parameters such as tempo, timbre and orchestration as a means to distinguish sections and make apparent the variety and complexity of the developments. In the music of Lutosławski and myself, the manipulation of musical parameters in order to construct a

⁹ Lutosławski, W. (2007). *Lutosławski on Music*. (Z. Skowron, Ed., & Z. Skowron, Trans.) Lanham, Maryland, USA: Scarecrow Press, Inc.

¹⁰ Nikolska, I. (c1994). *Conversations with Witold Lutosławski (1987-92)*. (V. Yerokbin, Trans.) Stockholm, Sweden: Melos.

¹¹ Boulez, P., Noakes, D., & Jacobs, P. (1964). Alea. *Perspectives of New Music*, 3 (1), 42-53.

¹² Boulez, P., Noakes, D., & Jacobs, P. (1964). Alea. *Perspectives of New Music*, 3 (1), 42-53, p. 44.

¹³ Boulez, P., Noakes, D., & Jacobs, P. (1964). Alea. *Perspectives of New Music*, 3 (1), 42-53, p. 47.

comprehensible structure was an essential part of the compositional process as Boulez discusses. ‘Aleatory’ was the only article I found that addressed the subject of aleatoricism from a composer’s point of view and in that sense it is invaluable to the literature.

The literature on Lutosławski is extensive, but there are a couple of outstanding academics. Firstly Charles Bodman Rae, who wrote *The Music of Lutosławski*¹⁴ based on his thesis *Pitch Organisation in the Music of Lutosławski since 1979*¹⁵ and secondly Steven Stucky, who wrote *Lutosławski and his Music*¹⁶. Both of these authors are composers. Stucky’s book is a critical biography that follows Lutosławski’s development as a composer from his student days until 1979. However the main focus of the book is Lutosławski’s ‘mature’ works (1960–79). Stucky discusses the elements of the late style including aleatoricism, pitch organisation, texture, macrorhythm and form. He provides a detailed musicological investigation into a number of works from these pieces, explaining first the general characteristics before examining them in great detail. Bodman Rae, who knew Lutosławski personally, provides another critical biography. This book not only includes biographical information on Lutosławski, but is also filled with interviews with the composer. *The Music of Lutosławski* is perhaps the definitive biography of the composer in print due to the personal insights that Bodman Rae provides. The analyses build on those of Stucky and the set of techniques that Lutosławski develops are made clear. Both of these books, however, do not have a particular focus on aleatoricism although they provide useful information on Lutosławski and his compositional techniques.

¹⁴ Bodman Rae, C. (c.1999). *The Music of Lutoslawski* (3rd Edition ed.). London: Omnibus Press.

¹⁵ Bodman Rae, J. C. (1992). *Pitch Organisation in the Music of Witold Lutoslawski Since 1979*. PhD Thesis. Leeds: University of Leeds.

¹⁶ Stucky, S. (1981). *Lutoslawski and his Music*. Cambridge, UK: Cambridge University Press.

This paper examines aleatory technique with particular reference to Lutosławski and myself. This allows for general discussion of aleatory techniques with specific examples from both composers. The compositions written for this study allowed me to not only study aleatoricism through Lutosławski's work, but also created an opportunity to experience firsthand the compositional issues, and therefore to find my own solutions.

Textural Composition

Aleatoricism does not stand alone as a compositional approach to textural music. It is part of a greater shift in the post-war compositional landscape, with texture increasingly focused on as a primary parameter, as opposed to the traditional emphasis on pitch and rhythm. This does not mean that pitch and rhythm are no longer of significance in textural works, but they are manipulated in a manner that creates the desired texture. Regardless of the choices of pitch and rhythm, texture is created from the consideration of multiple overlapping materials, to the point where the gesture/matter is diminished and the focus is drawn to the sonic result of the whole. The quality of the texture results from the quality of the material and the type of manipulation it is subjected to. As there is an increasing focus on texture, there is simultaneously a shift of attention away from the other musical parameters. This primary focus on texture cannot exist without the other musical parameters that create the material. For instance, prevalent intervals can still be heard in a dense texture. This is evident throughout Lutosławski's work during the 1960s. The refrains of the first movement of *Jeux Vénitiens* provide an exemplar of this approach. Its component materials govern registral span and density. The registral span is expanded each time the refrain reoccurs. The pitch material also changes: one twelve-tone chord moves to a second twelve-tone chord, which creates a change in density. Although the attention has been shifted away from the other musical parameters, they are still of importance despite being demoted to being of secondary importance. This change in focus led to new ways of conceiving a work, which share the common element of a compositional technique that takes into consideration global form, and became known as "textural composition", or simply "texture music".

Textural composition emerged as a significant compositional approach in the 1960s as composers became dissatisfied with the formalism of total serialism and the overly complex scores of the Darmstadt school in its post-Weberian serialist phase of the 1950s¹⁷. Many felt that this musical avenue was a dead-end, as the conceptual ideals and the musical outcomes of total serialism could not be reconciled, and investigated further compositional alternatives. Within the domain of “texture music”, many different compositional approaches emerged, including aleatoricism, as well as the micropolyphony of György Ligeti and the stochastic music of Iannis Xenakis. It will be instructive to compare these three different approaches, as they arguably arrive at fairly similar results, but through markedly different compositional techniques.

Micropolyphony

Micropolyphony is, as Steinitz fittingly defines it, ‘...a microscopic counterpoint, an internally animated yet dense texture in which large numbers of instruments play slightly different versions of the same line. At its core can be three or four part counterpoint of different melodies, but with each multiplied by perhaps a dozen or more variants of itself, resulting in an intricately complex web.’¹⁸ Micropolyphony is most strongly identified with Ligeti’s music from the 1960s and 1970s. His use of micropolyphony results in orchestral clusters (the static band of sound in which volume and instrumentation change only slowly or not at all, and in which every note

¹⁷ Steven Stucky, *Lutosławski and his Music* (Cambridge: Cambridge University Press, 1981), p. 77

¹⁸ Richard Steinitz, György Ligeti and Jonathan W. Bernard, “States, Events, Transformations,” *Perspectives of New Music* (Perspectives of New Music) 31, no. 1 (Winter 1993): 164-171. *György Ligeti: Music of the Imagination* (London: Faber and Faber Ltd, London, 2003), p. 103

of the chromatic scale within a certain range is sounding¹⁹). Ligeti is known today as one of a relatively small number of composers who in the late 1950s sought viable alternatives to post-Weberian serialism.²⁰ He found serialist music to be highly problematic, in particular ‘the organization of all the musical elements within a unified plan’²¹. Although he criticised serialism, he took the principles he found relevant from the ill-fated technique and discarded the rest. The aspects he retained were ‘the principle of selection and systemization of elements and procedures, as well as the principle of consistency: postulates, once decided upon, should be carried through logically’²². As with Lutosławski, Ligeti could hear the music he imagined in his head long before the 1960s (around 1950) but lacked the technique to put it down on paper. He wrote of a dream he had as a child that had a direct influence on the music he began to write at the end of the 1950s. He began to develop his technique of micropolyphony and attempted to realise the music that had previously only existed inside his head.

‘In my early childhood I once dreamt that I could not make my way to my little bed (which had bars and for me signified a haven) because the whole room was filled with a finely spun but dense and extremely tangled web, similar to the secretions with which silkworms fill their entire breeding box as they pupate. Besides myself, other living creatures and objects were caught in this immense web: moths and beetles of all sorts, which were trying to get to the weakly flickering candle in the room; and enormous damp, dirty pillows, whose rotten stuffing was bulging out through rips in the covers. Every movement of an immobilized insect caused the entire web to start shaking so that the big, heavy pillows swung back and forth; this, in turn, made everything rock even more. Sometimes the reciprocal movements became so violent that the web tore in places and a few beetles were unexpectedly liberated, only to be ensnared soon thereafter, with a choked buzz, in the rocking mesh once again. These periodic, suddenly occurring events gradually altered the internal structure of the web, which became ever more tangled. In places impenetrable knots formed; in others, caverns opened up where shreds of the original web were floating about like gossamer. These transformations were irreversible; no earlier state could ever recur. There was

¹⁹ Griffiths, P. (1997). *György Ligeti* (Second Edition). London: Robson Books, p. 28.

²⁰ Jonathan W. Bernard, “Inaudible Structures, Audible Music: Ligeti’s Problem, and His Solution,” *Music Analysis* (Blackwell Publishing) 6, no. 3 (October 1987): 207-236, p. 207

²¹ Jonathan W. Bernard, “Inaudible Structures, Audible Music: Ligeti’s Problem, and His Solution,” *Music Analysis* (Blackwell Publishing) 6, no. 3 (October 1987): 207-236, p. 207

²² Jonathan W. Bernard, “Inaudible Structures, Audible Music: Ligeti’s Problem, and His Solution,” *Music Analysis* (Blackwell Publishing) 6, no. 3 (October 1987): 207-236, p.209

something inexpressibly sad about this process: the hopelessness of elapsing time and of the irretrievable past.²³

The first piece in which he realised this music was in *Apparitions* (1958–9). The sonic structure of this work recalls the visual images he had first encountered in this dream. Ligeti never wished to write music with a narrative, but he had a tendency, like Xenakis, to transfer visual images into sonic structures. The sonic web he creates in this work was achieved through the technique of micropolyphony and is developed in his later works. Different types of movement are achieved through canonic devices and orchestration. Micropolyphony is achieved through the use of a small set of intervals in dense canons. The separate lines within the canons are unidentifiable and often move through the canon at different tempi. Because of the dense canonic structure of his music, the polyphony is largely unheard by the ear. Ligeti himself describes it as an ‘impenetrable texture, something like a very densely woven cobweb... The polyphonic structure does not come through, you cannot hear it; it remains hidden in a microscopic, underwater world, to us inaudible. I call it micropolyphony (such a beautiful word!).’²⁴ As Ligeti suggests, within micropolyphony are two worlds: the outer, audible one and the internal, inaudible one. The outer consists of this dense texture. Through small events, termed ‘acoustical projectiles’²⁵, it transforms over time changing the consistency of the web in such a way that it can never return to its previous state. These acoustical projectiles and the background web of sounds are the two elements that comprise Ligeti’s *Apparitions*. The inner, inaudible world comprises a large number of individual lines, which have had Ligeti’s strict polyphonic processes applied to each line. Each player—that is, each separate player rather than each section—has his or her individual part. For

²³ György Ligeti and Jonathan W. Bernard, “States, Events, Transformations,” *Perspectives of New Music* (Perspectives of New Music) 31, no. 1 (Winter 1993): 164-171, p. 164-5

²⁴ Péter Várnai, Josef Häusler and Claude Ligeti, György Samuel, *György Ligeti in conversation with Péter Várnai, Josef Häusler, Claude Samuel, and himself* (London: Eulenburg, 1983), p. 14-15

²⁵ Ove Nordwall, “György Ligeti,” *Tempo, New Series* (Cambridge University Press), no. 88 (September 1969): 22-25, p. 23

example, in his work *Atmosphères*, this results in fifty-six different string parts alone. Often these lines are unidentifiable individually but together they create the complex texture of Ligeti's sound web.

Changes in registral span, volume and density override traditional musical elements and become the noticeable features in the articulation of the overall form of his works. Within the sound mass he uses these 'acoustical projectiles', which continuously try to penetrate the web of sound. Like the insects in his dream, they reshape the web in such a way that it is irreversible. The audible world characteristically has an absence of pulse. Despite the lack of pulse, he notates it in 4/4; but he maintains that is only for ease of performance. Previously he had tried to use differing bar lengths but this affected the fluidity of the texture he strove for.²⁶

The inner, inaudible world is constituted by a multitude of individual lines that are subjected to strict polyphonic processes devised by Ligeti himself, though inspired by the polyphony of Ockeghem (c.1410-1497) and the Franco-Flemish school (1400s and 1500s). Although he continued to use rhythm, harmony and melody, these elements were no longer perceptible to the ear; they were submerged in the web of textures and sound colours. In order to diminish or eradicate the impact of the entries of individual parts, Ligeti instructed his performers to make their entrances as imperceptible as possible. This retains the outward sonic web while simultaneously increasing the complexity of the internal polyphony. Below is a time-space graph from Ligeti's work *Lontano* (1967), reproduced from Jonathan W. Bernard's

²⁶ Steinitz, R. (2003). *György Ligeti: Music of the Imagination*. London: Faber and Faber Ltd, London, p. 105.

*Inaudible Structures, Audible Music; Ligeti's Problem, and His Solution.*²⁷ This sketch shows that it begins in a narrowly delimited register. From this starting point, fifty-seven melodic lines unfold and create a mass of sound.

Example 6.1: Ligeti's *Lontano* b.1-41.²⁸



Ligeti is considered one of the masters at manipulating textures and sound colours over a long period of time. Through micropolyphony, he found a practical alternative to the methods of the serialist composers and in the process wrote innovative music that retains its originality to this day. His aims and achievements in textural composition paralleled those of Xenakis and Lutosławski.

²⁷ Jonathan W. Bernard, "Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution," *Music Analysis* (Blackwell Publishing) 6, no. 3 (October 1987): 207-236, p. 230-231

²⁸ Jonathan W. Bernard, "Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution," *Music Analysis* (Blackwell Publishing) 6, no. 3 (October 1987): 207-236, p. 230-231

Stochastic Music

Xenakis developed a new approach to composing that can be categorised as textural composition. It was based on mathematical theories of probability and chance. He applied these to his music during the compositional process, often with the aid of computers, resulting in a fully notated score that left no room for chance during the performance process. This approach he termed 'stochastic music', his reason being 'in honor of probability theory, which has served as a logical framework and as a method of resolving the conflicts and knots encountered'²⁹. These mathematical concepts can also be seen in diverse fields such as information technology, psychology, economics, biology, linguistics and genetics.

Xenakis had previously employed serialism to some extent, but soon became disillusioned with its limitations and the contradiction he saw between intellectual method and sonic result. Like other composers of this era, Xenakis began a search for a compositional means as an alternative to serialism. He found Messiaen's and Boulez's experiments with total serialism in the late 1940s and early 1950s particularly problematic, as they were conceived as a contrapuntal interplay of individual melodic lines, but when performed created a static mass of individual 'points'.

Xenakis, as he distanced himself from serialism, tried to take a more holistic view: that of the 'sound mass'. For some time he had been inspired by both naturally and

²⁹ Iannis Xenakis, *Formalized Music: Thought and Mathematics in Composition* (Pendragon Press, 1992), p. 5

artificially occurring mass sonic phenomena that followed stochastic laws. Such events occur in both nature and society: Xenakis provides examples such as ‘galaxies’, ‘clouds’, ‘nebulae’, ‘the behaviour of crowds of people’, ‘distribution of molecular motions within a gas sample’, ‘collision of hail or rain with hard surfaces’ and ‘the song of cicadas in a summer field’. He was inspired not only by the sonic but also by visual phenomena, such as the ‘movement of clouds across a sky’ and the ‘flight of many birds in a flock’³⁰. These mass phenomena are made up of many of small isolated events that, seen as an entity, congeal into a new global form. This mass form is articulated in time and forms a mould, which itself follows aleatory and stochastic laws.³¹ These laws are those that follow the transition from complete order to complete chaos (disorder). Chance and determinism are not separate poles but a continuous spectrum from disorder to order and vice versa; stochastic laws govern the movement between them.

Xenakis had a background first as an engineer and then as an architectural designer; he therefore understood how to manipulate materials in accordance with mathematical laws in order to impose form and order.³² When he turned his focus to music, he subjected his musical materials to the same process. One of the key features of his music is the organic nature of his form, or as Xenakis termed it, a ‘natural solution’. In order to create a natural solution, it was necessary to employ the use of mathematics as well as to study the intrinsic characters of the materials used.³³ Xenakis first used his natural solutions in architecture and then in music. This led him on the study the physical properties of musical instruments and their characteristic

³⁰ Paul Griffiths, “Xenakis: Logic and Disorder,” *The Musical Times* (Musical Times Publications) 116, no. 1586 (April 1975): 329-331, p. 329; Iannis Xenakis, *Formalized Music: Thought and Mathematics in Composition* (Pendragon Press, 1992), p. 8-9

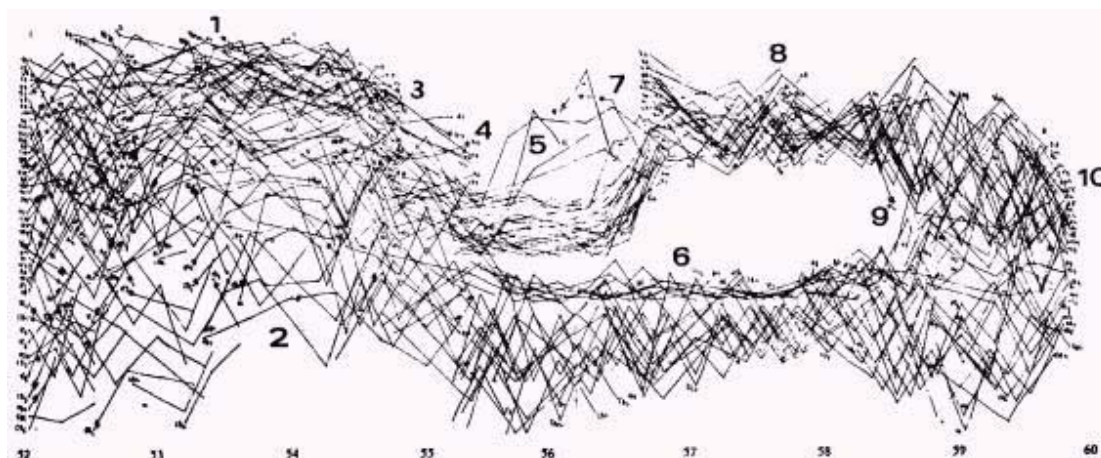
³¹ Iannis Xenakis, *Formalized Music: Thought and Mathematics in Composition* (Pendragon Press, 1992), p. 9

³² Nouritza Matassian, *Xenakis* (New York: Taplinger Publishing Co, Inc., 1986), p. 84

³³ *Ibid.* p.84.

and uncharacteristic sounds.³⁴ As well as applying mathematics (in particular statistics and Probability Theory), Xenakis paid particular attention to clusters of sounds, modes of attack and textures, while at the same time working on the evolution of large forms. Although Xenakis was working with density, volume and sound masses, he avoided the problem of his music lacking direction by concentrating on processes that simulated change the movement between order and disorder. Below is a sketch of a section from his work *Pithoprakta* (1956), reproduced Nouritza Matassian's book, *Xenakis*.³⁵ He has calculated precisely where each string glissandi starts and finishes.

Example 6.1: Xenakis's *Pithoprakta* 'actions through probability' (1956).³⁶



Xenakis, as both a mathematician and a musician, sought to create a music constructed from the principles of indeterminism and thus rationalise chance through using Probability Theory. He succeeded in moving away from the problems of serialism and began a new path towards a new pure music in his eyes unhindered by traditional conventions.

³⁴ Nouritza Matassian, *Xenakis* (New York: Taplinger Publishing Co, Inc., 1986), p. 86

³⁵ *Ibid.* p. 98

³⁶ *Ibid.* p. 98

Characteristics of Textural Composition

Textural composition has certain characteristics that differentiate it from other compositional approaches: the absence of pulse, the interest in sound mass and density, the use of clusters and the interest in large-scale forms that allow both static and dynamic sections to co-exist.

The absence of pulse is evident in the music of Lutosławski, Ligeti and Xenakis. Each of these composers had to devise their own compositional method to achieve their desired effect, and this process of devising took, in many cases, years to realise after the initial concept had been posited. Lutosławski avoids clear pulse in terms of ensemble coordination through using collective *ad libitum*. Although the music is written with specific rhythm, the use of individual *ad lib* tempi prevents a common pulse from occurring as each performer plays their part in their own time, while taking care not to synchronise with any other player (unless directed to do so). Ligeti, on the other hand, avoids the sense of pulse by unraveling his micropolyphony in which the pace of change is incredibly slow. The speed at which this takes place is so slow and the change so gradual and subtle that no sense of pulse emerges; all that is heard is a continuous flow. The lack of pulse in Xenakis's music comes from the use of his theories of probability, also resulting in a fluid, dense sound mass. Rhythm and metre are specified, but due to the high degree of syncopation and beat-avoidance, no pulse is perceived.

Tone clusters and the use of the semitone (minor second) are used extensively in textural composition. Ligeti uses semitones regularly in many of his works; in

Apparitions he opens with double basses playing a sustained minor second, creating a beating effect from the difference tones that occur. He describes his method in creating a flow as ‘two instrumental parts... intertwine... like twisted strands of a thread. Two diatonic solo parts combine to create a composite chromatic line’³⁷ these composite chromatic lines are essentially melodic articulations of a chromatic cluster, in which chromatic saturation is quickly achieved.

Lutosławski used a similar concept: he employed pairs of intervals so that even though all twelve tones often sounded simultaneously, he was able to control the *intervallic character* (harmony) of the resulting chromatic saturation. He aimed ‘to achieve a continuous change of pitch in the most precise way possible’.³⁸

Xenakis approached the concept of pitch in a different way. By identifying the x-axis with time and the y-axis with frequency, he mapped out his works in terms of register rather than specific pitch-classes. This resulted in clusters similar to those used by Penderecki, a younger Polish composer, also known for composing with aleatory techniques. Xenakis used both slow-moving clusters as well as more rhythmically active clusters, as can be seen in the previous example of *Pithoprakta*.

Structural control of masses and density is essential to textural composition, as by focusing on texture, the importance of traditional musical parameters is minimized, placing the focus on texture, timbre, dynamic and register. As soon as the focus is shifted to these parameters, the composer is, in essence, concerned with the concept

³⁷ Yulia Kreinin, ““To Arrest the Process” Moving Clusters by György Ligeti and Witold Lutosławski,” *Mitteilungen der Paul Sacher Stiftung* (Mitteilungen der Paul Sacher Stiftung), no. 15 (April 2002): 36-41, p. 36

³⁸ Yulia Kreinin, ““To Arrest the Process” Moving Clusters by György Ligeti and Witold Lutosławski,” *Mitteilungen der Paul Sacher Stiftung* (Mitteilungen der Paul Sacher Stiftung), no. 15 (April 2002): 36-41, p. 40

of sound mass. Perhaps Ligeti and Xenakis's interest in this idea originally stemmed from their work in electronic music, transferring these concepts to acoustic instruments and traditional ensembles. Or perhaps it came from, as suggested previously, serialist music that resulted in a type of sound mass as a result of total serialism's 'demelodicisation' of the musical surface. Regardless of how they came to work with sound masses, volumes and density, it is something that cannot be avoided when working within textural composition.

Each of these composers had different reasons for the approach they took. This largely followed their experiences before they changed their focus to textural composition. It is interesting to note that all three composers had an interest in mathematics: Lutosławski studied mathematics at Warsaw University but eventually withdrew to focus on composition and piano; Ligeti had a fascination with geometry and sat mathematical exams at tertiary level; Xenakis, as previously mentioned, was a trained mathematician and architect. Perhaps it was this interest in mathematics that led these composers to follow similar paths.

Alongside this interest, all three composers had, to some extent, an interest in chance. Both Ligeti and Lutosławski understood that their highly complex and detailed scores could not be realised precisely and they took into consideration the possible discrepancies that could eventuate in the performance process and tried to control these potential confounding variables. Lutosławski always composed whilst keeping in mind the least desirable outcome. While it was desirable for the players to be desynchronized at a local level, they needed to remain synchronised at a formal level. He came up with a way to prevent this from happening by using a complex cueing

system and composing individual lines. Xenakis, on the other hand, used chance procedures only in his composition process and expected that his scores would be followed precisely—the desynchronisation of individual parts therefore is written into the notation rather than in performance. Despite the concept of chance entering their compositional conceptions, they did not subscribe to the idea of total chance, like Cage and his contemporaries in America. The idea that a composer should have strict control over every detail of the score and his work still rang true and a balance between this compositional control and the discrepancies of the performance process were found.

Although these composers shared similar approaches, they differed because of their personal biographies. Ligeti's developments in micropolyphony came about through an interest in the polyphony of the Flemish school, and as a teacher of harmony and counterpoint; it is not surprising that he continued along this path. Lutosławski's development of limited aleatoricism came about after hearing a performance of Cage's *Concert for Piano and Orchestra* on the radio and it was this event that led him towards his developments in aleatoricism.³⁹ Furthermore, Lutosławski had a particular interest in the psychology of form and in harmony and contrapuntal thinking. He admitted that there were some similarities between his music and that of Ligeti; as he says, 'our methods of approach to the cause of producing music differ widely. The only thing that we share with each other is a certain musical sensitivity. Ligeti always hears things in an extraordinarily exact way. I set much store by this quality.'⁴⁰ Xenakis, as an architect, envisioned complex visual designs in his mind

³⁹ Bodman Rae, C. (c.1999). *The Music of Lutoslawski* (3rd Edition ed.). London: Omnibus Press, p. 84.

⁴⁰ Yulia Kreinin, "'To Arrest the Process" Moving Clusters by György Ligeti and Witold Lutosławski," *Mitteilungen der Paul Sacher Stiftung* (Mitteilungen der Paul Sacher Stiftung), no. 15 (April 2002): 36-41, p. 40

that he transcribed into musical works. He used mathematics from his architectural background as a formal tool to create the music that he heard in his head.

Amongst the composers of the twentieth century, there were many divergences from the mainstream compositional schools, of which Lutosławski's aleatoricism was only one. Thus, aleatoricism is not the only approach to textural composition, but it was the one that was most suited to Lutosławski, his background and his vision for a textural music.

Form

In the early 1960s, Lutosławski turned his attention away from pitch organisation towards musical forms. Much of his thinking about musical forms came from his earlier years when he studied composition under Maliszewski at the Warsaw Conservatory. Maliszewski's course had a lasting impact on Lutosławski's approach to form. As Lutosławski says in conversation with Irina Nikolska, 'the impact of his lectures on me can scarcely be exaggerated'⁴¹. This new attention toward musical forms coincided with the beginning of Lutosławski's use of aleatoricism. The way music is structured can be very different when implementing aleatoric techniques in more than conventional music. As the long-term force of conventional musical parameters, such as harmony and melodic line, is diminished, cohesion and teleology (assuming that the work is teleological) can and must be achieved through other means. Lutosławski constructed relatively simple formal structures to assist the listener in perceiving the basic structures of his works. This reflects his desire to communicate with his audience, an aim he believed should be the intention of every artist.⁴² As aleatoricism has a tendency to result in a work with a sectional nature, Lutosławski would only start work on the musical detail of a new composition when he had devised the overall form of the new work. His description of his compositional process illuminates this; in conversation with Bálint András Varga, he states: 'When I start work, it is as though I am flying over a city, and slowly losing height I can see more and more clearly the outlines, the streets and houses. Naturally I also start work frequently near the 'earth', when I see every detail very clearly and in close-up, and do not worry whether they are going to be eventually part of the whole concept or

⁴¹ Irina Nikolska, *Conversations with Witold Lutosławski (1987-92)*, trans. Valeri Yerokbin (Stockholm: Melos, c1994), p. 89.

⁴² Steven Stucky, *Lutosławski and his Music* (Cambridge: Press Syndicate of the University of Cambridge, 1981), p. 130.

not.’⁴³ This approach meant that he usually had some idea of the entire structure of the work before he started on the internal details. When using an aleatory approach it is often easier to focus on the overall structure first and the material second. Due to the sectional nature of aleatory music, the structure has a tendency to be architectonically conceived, rather than organically through-composed.

Maliszewski taught Lutosławski to analyse musical form using what he called the different ‘characters’ of music: *introductory*, *narrative*, *transitory* and *finishing*. The distinction between these characters is based on the psychology of the perception of music, as music is not only sound but also a collection of psychological reactions.⁴⁴ In other words, the distinction between the sections should be able to be felt by the auditor. Their psychological reactions help determine whether the section is introductory, narrative or finishing. Because of this, is it difficult to describe objectively how the composer creates a particular character. As Lutosławski says, ‘you must feel it’.⁴⁵ Each of the characters has a formal function in the structure. Of the four characters, Lutosławski considers the narrative is static, while the introductory, narrative and finishing are dynamic.

In static sections, the specific sonic materials come to the foreground due to the lack of change; as Lutosławski says, ‘I hear this [the content] and nothing else occupies my attention’⁴⁶. This is typical of narrative sections, where it is the content that is more important than its role in the work's structure. In dynamic sections, however, the opposite is true. In this case it is the section’s formal function—whether introductory,

⁴³ Bálint András Varga, *Lutosławski in Conversation with Bálint András Varga* (London: Chester Music, 1976), p. 35.

⁴⁴ Douglas Rust, “Conversation with Witold Lutosławski,” *The Musical Quarterly* (Oxford University Press) 79, no. 1 (Spring 1995): 207–223, p. 208.

⁴⁵ *ibid.*

⁴⁶ Nicholas Reyland, “Lutosławski, 'Akcja', and the Poetics of Musical Plot,” *Music and Letters* (Oxford University Press) 88, no. 4 (November 2007): 604–631, p. 613

transitory or finishing—that defines its primary perceptual character; as Lutosławski says, ‘I hear this, but, above all, I feel that what I hear is leading me on to something different which I shall hear in a moment’⁴⁷. Musical parameters such as orchestration, harmony, motivic development, rhythm, dynamics and tempo are harnessed teleologically to generate this change in structural function. A good example of this is in the *String Quartet* leading up to the climax (occurring at the end of figure 42). Each of the sections from figure 35 to figure 42 begins at *pp* and ends at *ff*. After the climax, the sections start at a louder dynamic and finish at *p/pp/ppp*, or they sustain a quiet dynamic throughout the section.

Table 7.1 – String Quartet, dynamic levels leading up to and following the climax.

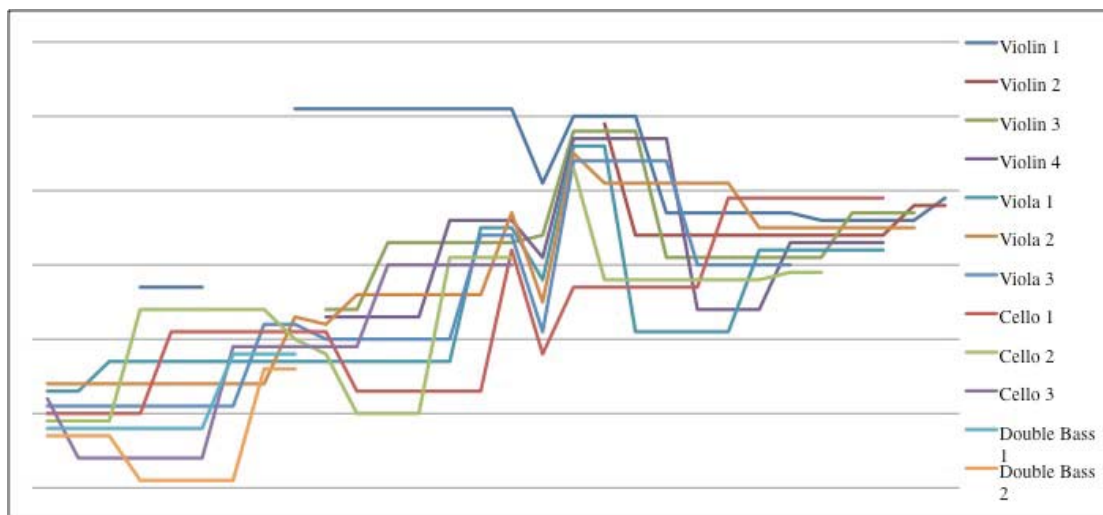
Figure	Dynamic
35	<i>pp cresc ff</i>
36	<i>pp cresc ff</i>
37	<i>pp cresc ff</i>
38	<i>cresc ff</i>
39	<i>ff</i>
40	<i>pp cresc ff</i>
41	<i>mf cresc ff</i>
42 (climax)	<i>ff;</i> <i>p cresc fff decresc</i>
43	<i>pp</i>
44	<i>pp</i>
45	<i>f decresc ppp</i>
46	<i>pp decresc ppp</i>
47	<i>ppp</i>
48	<i>ppp</i>
49	<i>p decresc ppp</i>

The form of the first movement of *Jeux Vénitiens* consists of alternations between refrains and episodes. The episodes develop harmonically leading to the climax; orchestration and register also aid in this development. Across the sections there is a gradual movement upwards to a cluster chord centred around C5. The harmonic fields

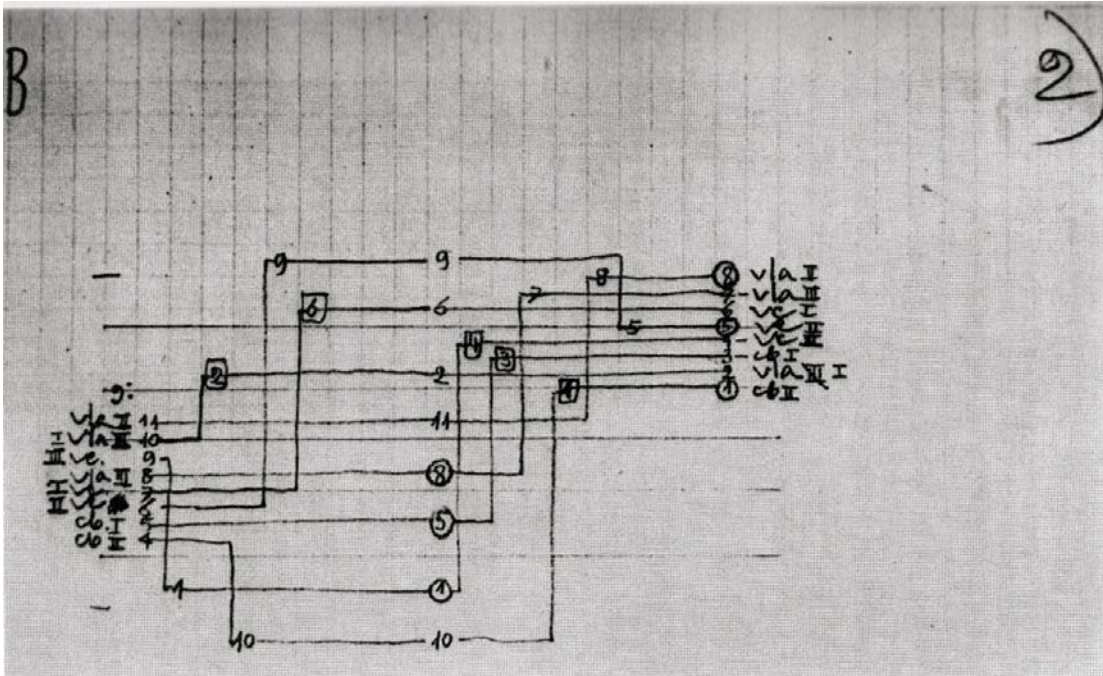
⁴⁷ *ibid.*

increase in chromatic density, orchestrational density and register leading towards the climax. In the first movement of *Jeux Vénitiens*, for instance, as the register climbs, the upper strings are added and the lower strings gradually drop out. Section B involves the entire lower string section, but by the time section H comes around, the double basses and third cello are tacet, and the remaining celli are high in their tenor register. This directional use of pitch register is demonstrated in graph 4.1 and as shown by Lutosławski's preliminary sketch, this was pre-planned.

Graph 7.1 - *Jeux Vénitiens*, registral spectrum of episodes in the first movement.



Example 7.1 - *Jeux Vénitiens*, section B, composer's original sketch for registral shifts.⁴⁸



As can be seen, the largest range occurs in the second episode whose function is to propel the section to the climax, a function partially achieved through change of register. Another point of interest is the sudden dip in register in the third episode before the continuation of the upward movement towards the cluster chord. This happens during the climactic episode. However, as this episode is only two seconds long, and contains material unsuitable for the climax due to its subdued and quiet nature, it is the second episode that generates direction towards the climactic section.

Table 7.2 - *Jeux Vénitiens*, change in string section's orchestration and register in the first movement.

Section	Instrumentation/Range	
B	Violin	Tacet excepting a couple of low register rhythmic notes and a high sustained E at end of section
	Viola	Starts in lower register, gradually moves into mid register
	Cello	Starts in lower register, gradually moves into lower tenor register

⁴⁸ Thomas, A. (2000). "Jeux venitiens": Working Methods at the Beginning of Lutoslawski's Mature Period. *Krakow: Musica Iagellonica*, pp. 255-287, p. 219.

	Double Bass	Starts in mid register, moving into tenor register
D	Violin	High E is sustained until near end, other violins start in lower register moving to mid register
	Viola	Mid register moving to treble register towards the end
	Cello	Start in high low register, 1 st cello moves quickly to tenor, 2 nd and 3 rd follow later in the section
	Double Bass	Tacet excepting a couple of tenor notes at the end
F	Violin	Mid register
	Viola	Mid register
	Cello	Mid register
	Double Bass	Tacet
H	Violin	High register, fills out with lower and mid register notes, gradually all move to a cluster around B5/C5
	Viola	Starts in high treble register, 3 rd viola in mid register, gradually all move towards C5
	Cello	Starts in high treble register, dropping suddenly to tenor register before dropping out altogether expecting a couple of short rhythmic harmonics
	Double Bass	Tacet

Many of Lutosławski's works display a bipartite form, which for Lutosławski was a successful way to approach large-scale form. The first movement is introductory, whose purpose is to lie out and expose material to prepare for the development of material in the main movement. The introductory movement contains a succession of heavily contrasting, incoherent sections, leaving the main movement to draw the rest of the threads together. This differs greatly from the conventional two-subject exposition, creating a palette of material to be explained in the more substantial second movement that contains the narrative, transitional and concluding sections of the work. In many ways this kind of form is a radical approach, not because of the episodes themselves but because of their highly contrasting nature. The fourth movement is more extreme in terms of the juxtaposition and over layering of contrasting sections. This structure can be found in many of his works including both

his String Quartet and *Jeux Vénitiens*. Although *Jeux Vénitiens* is a four-movement work, it effectively works as two movements. The first movement is introductory and the three following movements work together to act as a main movement. This was the first time that Lutosławski had attempted this structure and it is developed further in his later works, such as the String Quartet (1964), the Second Symphony (1967), the Third Symphony (1983), and slightly less obviously in *Livre pour orchestre* (1968). Despite the two-movement scheme that is applied to *Jeux Vénitiens*, each of the movements still maintain some development strategies. Each of the movements works towards its own climax without affecting its role in the greater work.

Lutosławski likens the problem of large-scale form with that of developing a dramatic plot, an idea he referred to as *akcja* ('action' or 'plot'). He argues that this is not to be seen as adding an extra-musical layer to the music, nor should it be an analogy with literature, but that it provides a coherent understanding of the musical structure.⁴⁹ Lutosławski argues that a piece of music is essentially a form of musical drama where sonic events come one after another, as do the episodes or scenes in a play. In narrative sections, new characters are introduced in a manner similar to the introduction of a new character in a play. When a new character comes onto the stage in a play, the audience's attention is drawn to them, as they are unfamiliar, just as when new material is introduced the listener's attention is drawn to it. Lutosławski goes to great effort to ensure the sequence of events is logical. In dramaturgical terms, we could see Maliszewski's characters as being more akin to 'scenes', as each musical section contains a number of further characters that populate these musical dramas. Lutosławski conceives of each section as possessing an overall quality, which

⁴⁹ Douglas Rust, "Conversation with Witold Lutosławski," *The Musical Quarterly* (Oxford University Press) 79, no. 1 (Spring 1995): 207-223, p. 209.

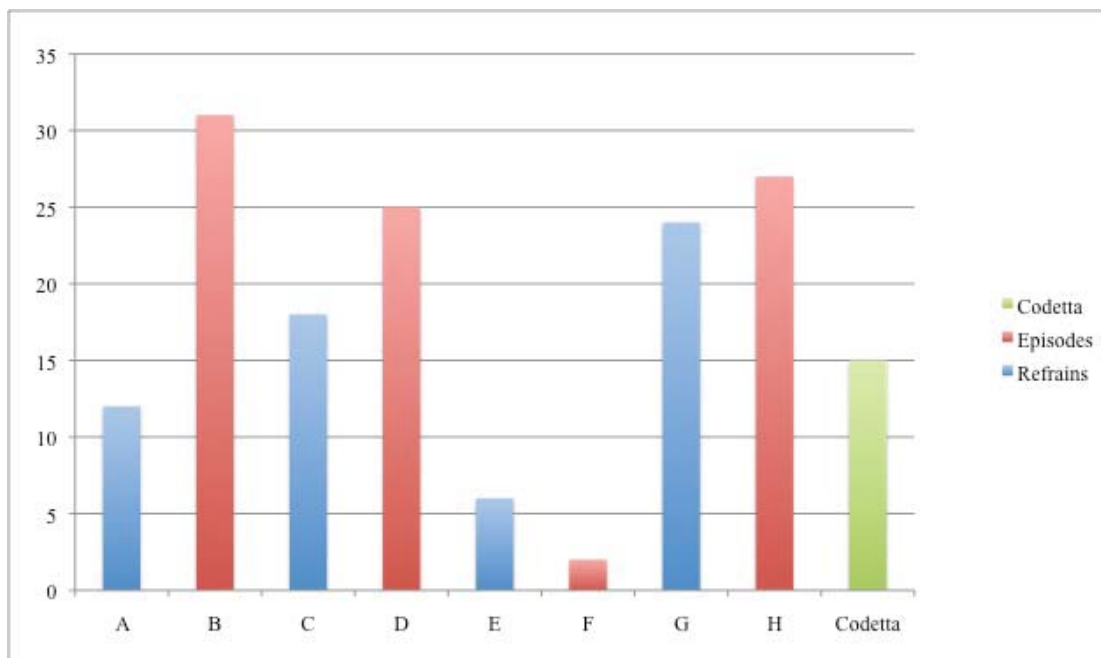
he terms key ideas (*idées clefs*). They have no rhythmic or melodic element; instead they are a complex construction of sounds that contain harmonic and thematic ideas. Similar to characters in a drama, they must interact, develop and evolve at moments of musical importance.

At this point, it is important to discuss the impact of the varying levels of macrorhythm. Musical form is tied up with the hierarchical organisation of rhythm and the highly sectional nature of aleatory music, particularly in the music of Lutosławski. His use of aleatoricism in the ensemble coordination within sections requires a downbeat to be provided at the beginning of sections, indicating that the players begin their *ad libitum* section. Once the section is underway, the performer is to play freely without synchronising with other performers. The deepest level of macrorhythm therefore is in the relationship between entire sections of the work, such as the introduction and development. Within these broader sections, smaller sectional divisions are articulated. In the development section of the String Quartet, for example, several subsections exist: the *appassionato*, the climax and the *funebre*. By varying the different lengths of sections approaching the climax, and lengthening them towards the end, a sense of teleology is achieved and the listener is led to and from the climax. Lengthening sections creates a sense of stability or cadence, whereas shortening sections creates a sense of instability or flux.

In the first movement of *Jeux Vénitiens*, the two main characters are represented by the refrains and episodes. The refrains develop through orchestration and length of the action (sections). As the graph below shows, the first occurrence of the refrain contains only woodwind and lasts twelve seconds. The second occurrence adds

timpani to the woodwind and lasts six seconds longer than the previous time (eighteen seconds). The third occurrence adds the brass and only lasts six seconds. The fourth and final occurrence adds the piano and lasts for twice as long as the first occurrence (twenty-four seconds). The addition to the orchestration intensifies each of these sections. As the climax of the movement is approached, the refrains progressively become shorter (with the exception of section C) and as the climax subsides, the sections lengthen.

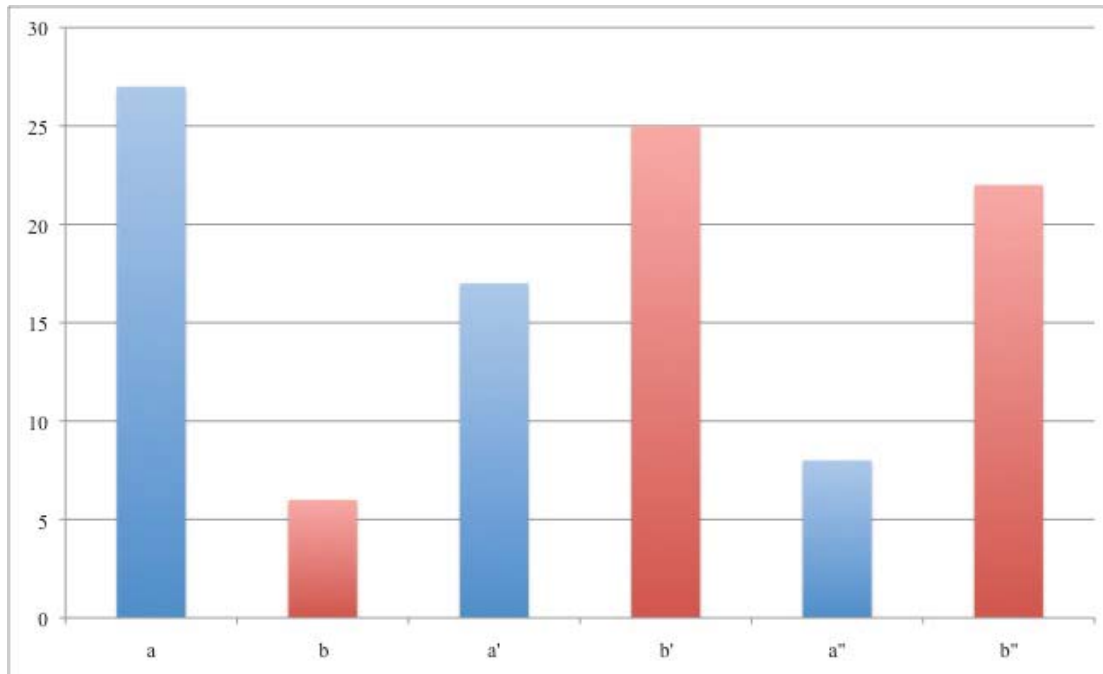
Graph 7.2 - *Jeux Vénitiens*, macrorhythm of first movement
(y axis = time in seconds; x axis = sections)



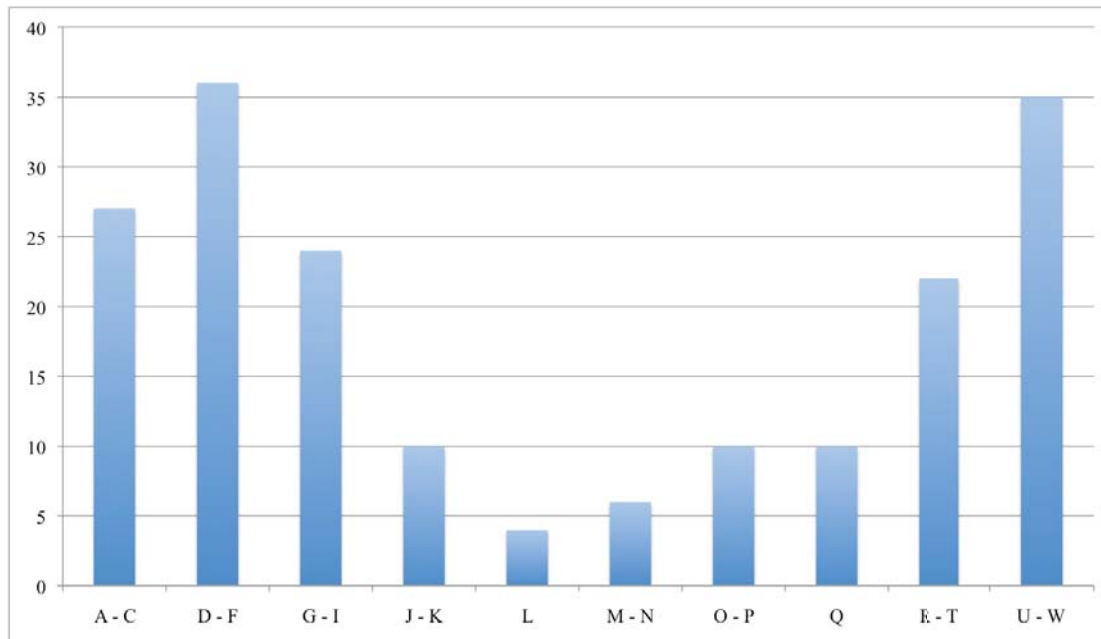
The second movement breaks away from this model. It is a short *scherzo* that gradually replaces the ‘a’ material with ‘b’ material. This movement does not apply any aleatory procedures, although the alternation between two different types of material (‘a’: a collection of fragmented phrases played by the strings, and ‘b’: continuous, predominantly harmonic material played by woodwinds, harp and mallet percussion) is similar to the juxtaposition of the two types of material in the first movement. The third movement, however, continues with a similar sectional structure

as the outer movements, despite its melodic and harmonic emphasis. Each of these movements has their own development and climax, although ultimately they are fragmented and static in nature and leave the listener waiting for the main event, the fourth movement.

Graph 7.3 - *Jeux Vénitiens*, macrorhythm of second movement
(y axis = time in seconds; x axis = sections)

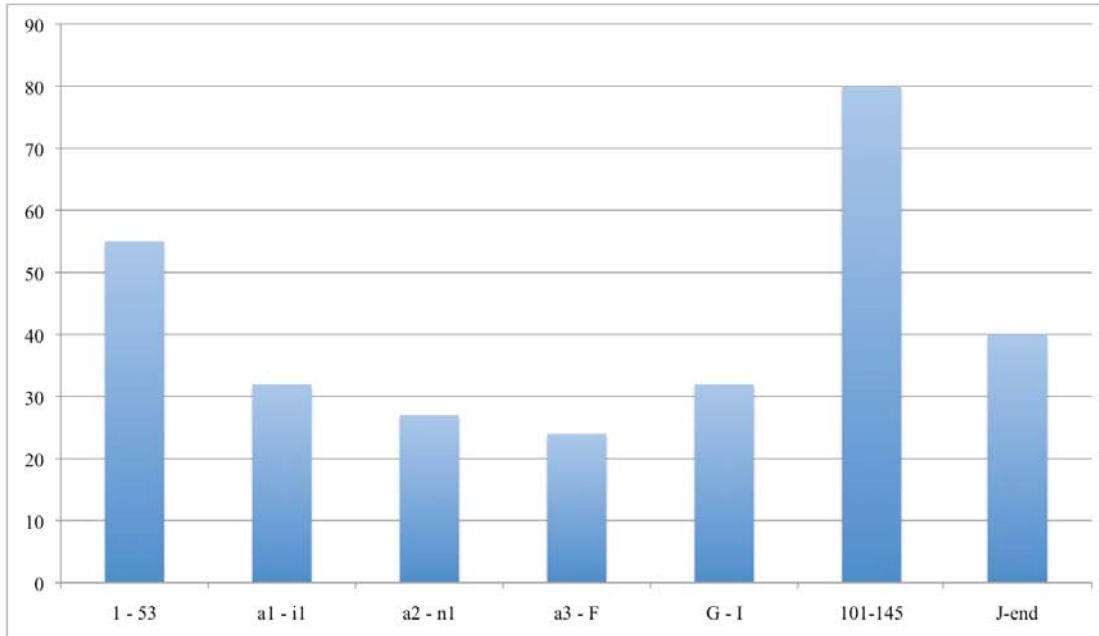


Graph 7.4 - *Jeux Vénitiens*, macrorhythm of third movement
(y axis = time in seconds; x axis = sections)

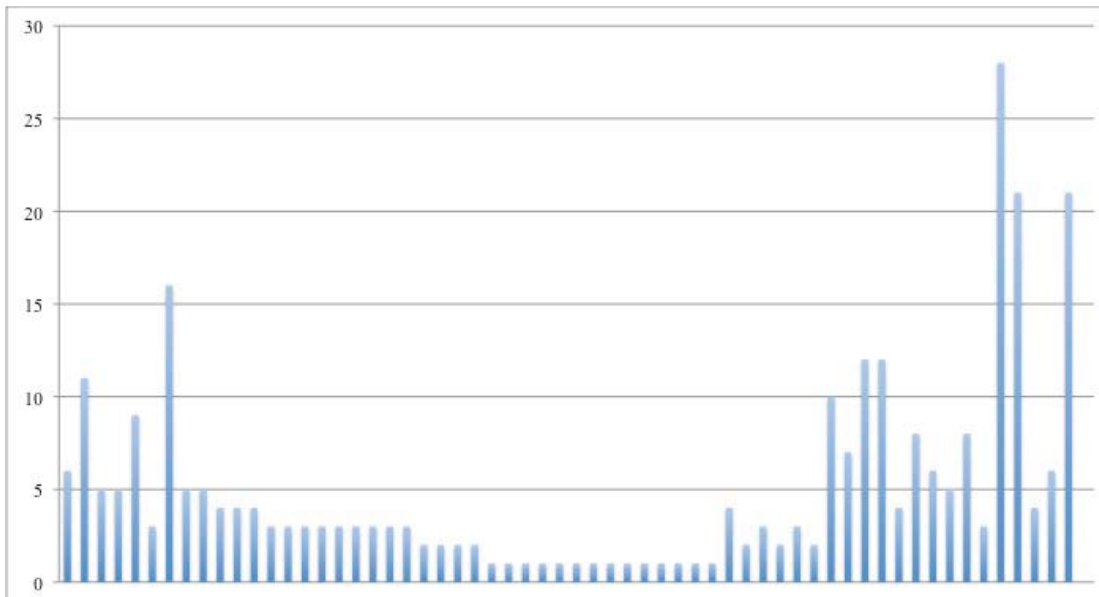


As Lutosławski's aleatoricism advances through *Jeux Vénitiens*, the sections become harder to separate as they overlap and superimpose in an attempt to resolve the sectional nature of his composition. For example, when comparing the first movement of *Jeux Vénitiens* with the fourth movement, the first movement appears to use aleatoricism to a greater degree; in fact it is the fourth movement that takes the use of aleatoricism to a new, more complex level using both *ad libitum* and *a battuta* sections. The use of a macrorhythmic accelerando is more obvious in this movement. As Graph 7.5 shows, it follows the same structure as the first movement with the sections shortening towards the climax and lengthening as it exits. This is more obvious when it is broken into the smaller sectional divisions (Graph 7.6).

Graph 7.5 - *Jeux Vénitiens*, macrorhythm of fourth movement
(y axis = time in seconds; x axis = sections)



Graph 7.6 - *Jeux Vénitiens*, macrorhythm of fourth movement
(y axis = time in seconds; x axis = sections)



The fourth movement is the main movement in the scheme and finally brings the work to its main climax through a number of dynamic sections before entering a subsidiary conclusion. It begins with an introductory section with overlapping blocks of strings and woodwinds. When the piano enters at a1, a new section has begun and

the movement begins to move towards the climax. The section is made up of short blocks each featuring a section of the orchestra. These blocks overlap and are gradually superimposed over other blocks while at the same time shortening in length as the climax grows near. This section can be broken down into three stages, each one becoming more intense as the number of blocks increases: the first has nine blocks that happen in thirty-two seconds; the second has fourteen blocks that happen in fourteen seconds; the third has thirty-six blocks that happen in twenty-four seconds. The climax itself consists of three *ad libitum* sections and is ended by the percussion who attempt to continue the climax. With the entrance of the celesta, harp and piano at b.109, it is obvious that the climax is over; a new stage in the structure—the concluding section—has begun. Reminiscent of both his String Quartet and *Trois poèmes d'Henri Michaux*, the work ends with a subdued and reflective air.

By using a formal plan similar to that of a musical drama, Lutosławski is able to guide the listener through his *Jeux Vénitiens* by appealing to their psychological reactions while maintaining their interest. By applying basic structures and using Maliszewski's 'characters' of music, he is able to communicate on both a basic and complex level to his audience. The macrorhythm of the individual sections provides a way of creating a sense of teleology towards the climactic points while using a technique that generally produces static music. This effect is assisted by creating teleology not just through the macrorhythm but by using other parameters such as dynamics, instrumentation and register. This model was used later in his String Quartet, but not in his *Trois poèmes d'Henri Michaux*, the form of which is mostly dictated by the lyrics.

Issues in Aleatory Composition

Aleatory composition, as with other approaches to composition, brings with it both advantages and disadvantages. The introduction of chance into the work can create compositional issues, practical issues and performance issues. Issues occur depending on the amount of chance used. Lutosławski applied controlled aleatory procedures to his music (not to be confused with approaches that apply a more general indeterminacy). The only aspect of his music that relies on chance is ensemble coordination. His pitches, rhythms, instruments, expression markings and structures are fully specified and notated. He uses aleatoricism as a means to create the sound world he imagines rather than to liberate the performer. In my own works in the attached portfolio, I applied several different approaches to aleatoricism, including applying chance to ensemble coordination, pitch and improvisation. In my wind trio, I approached aleatoricism in a highly controlled manner, similar to Lutosławski's method. However, in *Our Own Demise* and, to a greater extent, in *Portals*, I attempted somewhat to liberate the performer from the notation and allow them to be more involved in the creative process.

Compositionally, problems arise at a structural level. As aleatory music has a tendency to produce block-like, static structures, the composer must find a way to create a comprehensible trajectory over the course of the work. By using macrorhythm, orchestration, registral spectrum, dynamics and pitch, this is possible. While the composer determines the macrorhythm, the microdetail is left up to the performers. The amount of contribution the performers have over the microdetail is different for each composer. Lutosławski specifies his material, whereas I left a lot of

the internal workings to the performers. The compositional advantages of this technique are the ease of creating complex textures and the quick generation of material.

On a practical level, the composer must consider how to create the score and parts when aspects are left undetermined. Cues, the use of a conductor, signals and modules are all ways to assist the performers to create an end result that coincides with the composer's intentions. Then there are notational problems. Notation itself is not an issue; rather it is the use of notation software that produces difficulties in aleatory composition. Finally, there is the question of the portability of the work. Ideally the composer would not have to be present during the rehearsal process, but sometimes this is not feasible. Lutosławski found ways around this issue and has had his works performed all over the world without his presence.

The introduction of chance elements into the performance process brings with it performance issues. This largely depends on the particularly chance procedures employed and the extent to which they are used. The addition of improvisation brings with it a stronger sense of 'partnership' with the performers, but it also raises questions about how much control the composer is really willing to give up and whether they can overcome this psychological barrier and accept the outcome regardless. The main concern with the addition of improvisation and aleatoricism is that the quality of possible outcome is more variable. While the performance may be better than expected, there is a stronger possibility that the performance may be worse, and the effect of a poor performance on the structure of the work is amplified.

The real disadvantage in highly improvised works is that the composer must accept these risks.

Over the next three sections, I shall discuss compositional issues, practical issues and performance issues in aleatory composition in relation to Lutosławski's music and my own portfolio.

Compositional Issues in Aleatory Composition

In terms of compositional issues, there are a number of concerns. One of the greatest compositional difficulties when using aleatoricism is that of structure and form. One of the downfalls of aleatory composition is the nature of the music it produces. It has a tendency to create static, block-like structures. This is the case in many of Lutosławski's aleatory works from the 1960s, including both *Jeux Vénitiens* and *Trois poèmes d'Henri Michaux*, as well as in both my own orchestral piece *Our Own Demise* and wind trio *Seven Point Zero*. This is because the points of coordination in the ensemble occur at the beginnings and ends of sections. Both Lutosławski and I did not coordinate the ensemble within the sections. Instead, a downbeat is given at the beginning of each section allowing the players to come in together. From this downbeat onwards (in aleatory sections), the performers are playing *ad libitum*. At the beginning of each section, regardless of its length, there is an opportunity for change. A new section provides an opportunity for development, whether it is motivically, dynamically, harmonically or rhythmically. Due to the block-like structures that aleatoricism produces, development happens over the course of many sections rather than during an individual section. This brings up the issue of how to create a work

that both utilises aleatoricism and generates a trajectory over the course of the work. Each composer addresses this problem with a different approach, which can vary for each of their works as they seek an answer to this issue.

Lutosławski addresses this problem by various means: macrorhythm, orchestration, registral spectrum, dynamics and pitch. In my portfolio, I also attempted to find different solutions. Macrorhythm is the most obvious way to control the trajectory over the course of a work. When dealing with block-like structures, each block has a specified length of time (approximate or otherwise). As the blocks approach the climax, they become shorter, increasing the musical instability, and thus tension. Moving away from the climax, Lutosławski lengthens his blocks creating a sense of stasis and cadence. This might seem an obvious solution; when combined with the use of orchestration, registral spectrum, dynamics and pitch, however, the result is effective in creating a trajectory. A clear example that demonstrates the use of these musical parameters that create a coherent trajectory is in the first movement of *Jeux Vénitiens*. The movement is made of four rhythmically active refrains juxtaposed with four slow-moving sustained episodes. The blocks interact over the course of the movement: the refrains provide a gradual intensification through both pitch content and orchestration, while the episodes manipulate register to provide a sense of direction towards the climax and ultimately the end of the movement.

The woodwind play the first refrain and at each reoccurrence of the refrain there is an addition of another section of the orchestra. This not only creates a crescendo through the orchestrational change, but with each addition of an instrumental section, the pitch material changes. The woodwind effectively plays a twelve-tone broken chord with

the pitch material 23222/5/22232⁵⁰. Rhythmic intensity grows when the timpani joins in the second refrain. The third refrain adds the brass that introduces the beginning of a second twelve-tone chord with ic1. Finally, in the fourth refrain, the addition of the piano, celesta and harp play the remaining notes of the second twelve-tone chord. In between each of the refrains, there are episodes that consist solely of strings. The movement within each episode focuses on registral change. In the first episode, for example, the violins are mostly *taceting*, excepting a couple of low-register rhythmic notes and a high, sustained E at the end of the section. The violas start in a low register and gradually move into a middle register. The celli start in a low register and gradually moves into the lower tenor register. The double basses start mid-register, moving into their tenor register. By the time the fourth episode occurs, the violins are in their high register, as well as filling out the middle and lower registers. The violas are in their high treble register, with third viola mid-register. The celli are in their high treble register, dropping suddenly into their tenor register before becoming *taceted*. The double basses have been *taceting* since the second episode. Over the course of the episodes, the intensity grows as the instruments move into their upper registers (refer to Graph 8.1).

While the control of the registral spectrum, orchestration and harmony assist the trajectory of the movement; there is an underlying change in the macrostructure. This example has already been referred to in the chapter on form; it is, however, worth mentioning again as it is the most effective way of creating trajectory throughout the work. The climactic section occurs at figure G. The episodes reduce in length every time until the last occurrence. The same is true of the refrains excepting figure C (see

⁵⁰ The numbers collate to the number of semitones present in each interval e.g. 2 is a major second, 3 a minor third etc. Lutosławski often built his chords based on intervallic technique that allowed him to create dense textures.

Graph 8.2). The graph shows the length of each section in seconds (note that this graph is based on one particular recording and lengths of sections will vary from performance to performance).

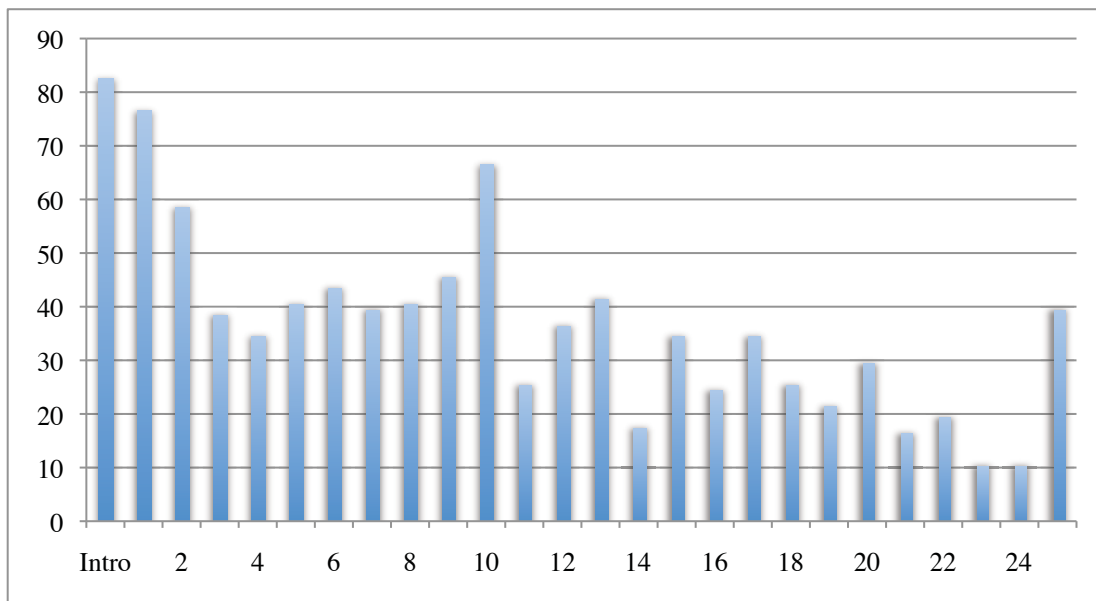
The shortening of sections provide a push through to the climax while the lengthening of sections after the climax allow the tension to ease. I used a similar approach in *Our Own Demise*. Altering the macrorhythm is only one of the ways that a trajectory can be formed over the course of the work. Dynamic levels within sections are used to create an overall crescendo to the climax and a subsidiary decrescendo to finish. Lutosławski used this method in this String Quartet leading up and away from the climax (see Table 8.1). I employed a similar approach in *Our Own Demise*, where each section grew from the previous section. By intensifying each musical parameter to create a tension-release arc, I created a number of quasi-climaxes throughout the piece and provided it with direction. While this is true of much music, the introduction of aleatory technique into the compositional process is a particularly difficult challenge for the composer to deal with structurally, and brings with it particular solutions to create these structural shapes.

Comparatively, in *Our Own Demise*, I used orchestration in the aleatory sections to create a push towards the quasi-climax at the end of the first half of the piece (figure 12 in Section 9). Each section of the orchestra uses the same material for each of the aleatory sections: the brass sustain pitches while performing a decrescendo; the strings glissando between designated pitches *ad libitum*; the percussion and woodwind have rhythmically active parts relating to the previous aleatory section.

In order to create a trajectory towards the climax of the aleatory sections, the orchestra is used in different combinations until reaching a loud *tutti*. As can be seen in Graph 8.1, over the course of the work the sections became shorter. Ideally, the aleatory sections would become even shorter as the quasi-climax approaches to increase the tension.

Graph 8.1 - Macrorhythm of *Our Own Demise*

(x = sections, y = time in seconds)



As a composer, I found using aleatoricism to be liberating because much of the microdetail is left up to the performers. This allows the composer to focus on the macrostructure of the work and each section as a whole. As the structure becomes more crucial to the work, as it does when working with aleatoricism, it is important to have the structure developed at least partially at the beginning of the compositional process. Often when working with the microdetail in fully notated works, the composer loses sight of the piece as a whole. Microdetail is still of importance in aleatory writing, but when applying aleatoricism to ensemble coordination, the outcome is often a surprise to the composer. The internal detail is left up to the

performers and the composer must have the least desirable outcome in mind. Because the composer shares the determination of the internal detail with the performer, it provides an opportunity for the composer not to be caught up in the micro-detail and instead focus on the overall texture.

Lutosławski was aware of this matter and often sketched the form of his compositions along with any other ideas first. As mentioned previously, he says, ‘When I start work, it is as though I am flying over a city, and slowly losing height I can see more and more clearly the outlines, the streets and houses. Naturally I also start work frequently near the ‘earth’, when I see every detail very clearly and in close-up, and do not worry whether they are going to be eventually part of the whole concept or not.’⁵¹ Lutosławski places importance on the internal detail but takes care not to become caught up in it.

While aleatory technique provides some complications to the compositional process, it also has many benefits. Firstly, complex textures can be easily realised without resulting in a high level of rhythmic complexity and difficulty for the performer. By combining aleatoricism with rhythm, it can ‘considerably enrich the repertoire of the means of expression’⁵². Lutosławski achieved his textures through the lack of ensemble coordination. This allows each player to play their part at their leisure as if they are performing solo. Usually a tempo marking is specified with a range that the players can play between. The lack of ensemble coordination creates multiple tempi to occur simultaneously. The addition of *accelerandi* and *retardant* happening simultaneously enhances this effect. The resulting rhythms from the introduction of

⁵¹ Bálint András Varga, *Lutosławski in Conversation with Bálint András Varga* (London: Chester Music, 1976), p. 35.

⁵² Lutoslawski, W. (2007). *Lutoslawski on Music*. (Z. Skowron, Ed., & Z. Skowron, Trans.) Lanham, Maryland, USA: Scarecrow Press, Inc, p. 99.

the element of chance are not only easy to play but are of a highly sophisticated nature unique to aleatoricism. Although rhythms do have the potential to be complicated, the performer does not have to coordinate them to other performers or to a pulse. The desynchronisation of the ensemble allows individual rhythms to sound more complex than they are on the page.

In Lutosławski's *Trois Poèmes d'Henri Michaux*, the orchestra and chorus have relatively straightforward parts. It is the number of instruments and voices involved that creates the complex and interesting textures. This idea of creating complex textures from relatively simple rhythms—or in my case melodies—was the basis of *Portal #1*. Each player was given a melody and asked to play it repeatedly while embellishing it with pitches from a given scale. The sonic outcome was of a kind of non-notated heterophony. The nature of the melody has a mournful tone and the aleatory nature provides some interesting dissonances.

Secondly, the generation of material is a lot quicker compared with writing complex, fully notated scores. For example, figure 3 of *Our Own Demise* consists of nine rhythmic motives that are the same in each part for the entire orchestra. This section did not take long to write and it lasts over a minute in performance. Modules appear later in the piece that range from complex (woodwind and percussion) to simple (brass and strings). These modules did not take long to write, but the time saved on the compositional process was made up for later in the typesetting process, which will be discussed in the next section.

Practical Issues in Aleatory Composition

The use of aleatoricism brings with it many practical issues that must be considered. Most of these deal with the problems that arise when creating the score. The composer must consider how to create a score that faithfully represents the work. Lutosławski struggled with this issue when writing his *String Quartet*: in the end he did not create a score, instead provided his musicians with only their individual parts. When he was asked to create a score, he objected saying:

‘You may ask me why I attach such importance to the non-existence of a score of my piece. The answer is quite simple: if I did write a normal score, superimposing the parts mechanically, it would be false, misleading, and it would represent a different work. This would suggest, for example, that the notes placed on the same vertical line should always be played at the same moment, which is contrary to my intention... That would deprive the piece of its ‘mobile’ character, which is one of its most important features.’⁵³

This problem was eventually solved by the creation of a study score with individual parts in boxes (‘modules’) to resolve the linearity problem of the score. In his larger orchestral works, Lutosławski used repeat marks around the sections that the players were to repeat until cued.

In my own works, I used a combination of modules and repeated sections. I used modules in *Seven Point Zero* so that the performers could repeat the modules in any order within the defined sections for a determined length of time. Repeat marks were used in the orchestral piece simply because modules with boxes around them take up more page space and it was not feasible to fit them on the page. Either approach produces the same result as long as a performance note is provided explaining the particular notational approach used.

⁵³ Irina Nikolska, *Conversations with Witold Lutosławski (1987-92)*, trans. Valeri Yerokbin (Stockholm: Melos, c1994), p. 25-6.

The greatest practical issue with aleatory scores is the use of current notation software to produce the score and parts. To create my scores I typeset them in the music notation package Sibelius 5. This program is based on the concept of distinct, aligned bars across all parts, whereas aleatory composition is not. This is an inbuilt assumption of the software, as it was created in order to facilitate the typesetting of conventional metric music. As aleatory modules are not always the same length in every part, the composer must typeset the work using aligned bars and rests, then hide them to give the impression of a desynchronised notation. Every repeat mark that is used must be individually inserted and positioned, as must each box that surrounds each module. When creating parts the same issues arose again and had to be fixed again. While this is not a difficult process, it is a very time-consuming and tedious one, particularly if the score is reopened in a later version of Sibelius, which can further upset the manual formatting. Proofreading is an essential part of any compositional project, but the issues are multiplied when typesetting aleatory scores because objects have a tendency to disappear or become arbitrarily displaced, particularly in the parts. The time saved during the composition process was more than made up for in the typesetting process. In the future, I will either handwrite my aleatory scores or find more suitable notation software rather than using Sibelius, as it was more of a hindrance than help. An alternative would be to seek professional advice for using Sibelius, and establish clear and consistent workflows for aleatory music.

Notation is a crucial part of twentieth and twenty-first century composition. The notation that both Lutosławski and I use is largely based on conventional notation. Moments of synchronisation are marked on the score and parts, and a conductor is

There is also the issue of the portability of the work. With a combination of composer and performer input, some works are not easily transportable if the composer must be active in the rehearsal process. This restricts the work's accessibility somewhat, unless other solutions can be found to prevent the necessity of the composer's presence. Lutosławski's solution was a complex cueing system with highly detailed performance notes instructing what each performer should be doing at each time, which allows his works to be performed in his absence. *Our Own Demise* and *Seven Point Zero* are written in a similar vein and I was hardly required at rehearsals as the instructions were clear. *Portals*, however, incorporated a greater degree of chance and improvisation, and it was clear that I was needed to be present as a part of the rehearsal process. The performers had more liberty within this work than I had intended, and the initial performance with the Silencio ensemble was quite problematic. After re-recording it with another ensemble, however, I realised that there were aspects of Silencio's performance that I preferred, such as at the end of *Portal #1*, in the performance the bass player continued improvising on the final bars for substantially longer than was notated.

It is also the nature of aleatory composition that the result is often a surprise. For the composer, asking performers to improvise is an aspect of releasing some creative control. Within this it is important to realise that by including other people in the creative process, uncertainty of the final result occurs. Perhaps the problem of the performance outcome lies with the composer rather than the audience as it is the composer who has allowed his/her music to be influenced by outside sources and thus must accept the outcome satisfactory or otherwise.

Performance Issues in Aleatory Composition

The introduction of chance into the work can create both practical and performance problems. Issues occur depending on the amount of chance used. As Lutosławski says ‘I firmly believe in a clear delineation of duties between composer and performers... I have no wish to surrender even the smallest part of my claim to authorship of even the shortest passage.’⁵⁴ He uses aleatoricism as a means to create the sound world he imagines rather than to liberate the performer. I applied several different approaches to aleatoricism including restricting chance to influence ensemble coordination, pitch and improvisation. In *Seven Point Zero*, I approached aleatoricism in a very controlled manner, similar to the Lutosławski’s way. However, in *Our Own Demise* and to an even greater extent in *Portals*, I attempted to somewhat liberate the performer and allow them to be more involved in the creative process.

Aleatory works and works that have indeterminate features are both of an improvisatory nature. However, improvisation differs greatly from the use of aleatoricism found in Lutosławski and other European composers’ works. The Oxford Dictionary of Music defines improvisation as ‘a performance according to the inventive whim of the moment, i.e. without a written or printed score (although charts are permitted), and not from memory’.⁵⁵ I used improvisation to find not only a way to create an imagined sound world but also to extend the creative compositional process to include the performer. In this context, aleatoricism is not only a compositional tool but also a political tool. The idea of sharing the creative process with the performer allows opportunities for performers to influence a work that is

⁵⁴ Undercurrents

⁵⁵ Oxford Diction of Music 356-7.

stylistically specified. Jazz players that improvise within the jazz idiom have the benefit of the stylistic and harmonic conventions that come with it. Including improvisation in a contemporary piece of music, the composer must also take into consideration what, if any, guidelines should be provided for the improvisation. When writing *Portals* this was an issue I had to take into account, particularly as the ensemble was for both classical and jazz musicians. My approach was to set up a specified sound world and assign pitches to the soloist(s). The pitches were given in four-pitch cells that the soloist had to move through during his solo.

By introducing improvisation into my works, I set up a partnership between the composer, my performers, and myself. Aleatory music allows the representation of the performers feelings at the time of the performance, as does fully notated music. However aleatory music lets the performers express themselves through a broader range of musical parameters. This changes the character of the music as the creative input comes from both the performer(s) and composer. In some cases this is an equal partnership, but in more cases than not the composer still has the greater creative input. In the first case I have tried to move towards this equal partnership in my piece *Portals*, which had its challenges. These challenges are more related to the issue of the composer giving up control than anything else. I approached this work eager to enter into an equal partnership with the performer but found that giving up compositional control was harder than expected. There is a psychological barrier involved in giving up compositional control, although this is harder for some composers than others. After a second recording of *Portals* I discovered that I had enjoyed the liberties that Silencio had taken with my piece, despite this not being the case at the time. The issue is that the composer does not always have control over

who performs their works; therefore the quality and the attitude of the performer(s) who are involved can have a significant effect on the performance itself. The concern that the performers will make decisions that contradict the composer's original intention is always there but it is a risk that can create an unexpected but desirable outcome.

In the future I hope to break down the barrier of giving up control and enter into an equal partnership. One way I intend to approach this is by not only composing the music, but by being involved in the performance process. In works where the composer and performers work together, many of the exciting creative moments happen during the performance process. Many of the great jazz composers knew this and wrote charts for their bands with the knowledge of who was playing. By being involved in the performance process, the composer has greater control over who performs their works. It does, however, limit the portability of the work. The inclusion of improvisation into the composition allows the composer to be surprised by the outcome, either positively or negatively. When working with talented and sympathetic musicians, their contribution to the result is invaluable as their musical language could be entirely different to the composers but adaptable to the work. Once improvisation is included in the work, the composer has given up some of their control and if you abdicate control you must accept the outcome regardless.

Whether using improvisation or aleatoricism, the rehearsal process is different from rehearsing a fully notated score. Once the musicians have understood the framework of the work they move from focusing on their own part to listening and responding to each other, unless specified otherwise. It is a quicker process to leave the notation

behind and focus on the music; something that there is never enough rehearsal time for when rehearsing a fully notated score. The performers understand the piece much faster and become more musically involved. Hopefully, this heightened involvement also increases the performers' enjoyment of the work. This focus on the restoration of the pleasure of making music is one that Lutosławski strongly believed in; as he says when discussing the reasons for his use of aleatoricism, 'another advantage of this kind of technique is the restoring of the pleasure of music making. The performers with no effort achieve the most complex textures and rhythms. The weakness of many works composed in the last decades is their difficulty, which alienates the performer from the composer and his music.'⁵⁶ It should not be forgotten that making music, though intellectual, should also be pleasurable.

Aleatory music provides an opportunity for the composer to make music that is always 'in the moment'. It represents the energy of the performers at the time of collaboration. An example of this happened during the recording process of *Our Own Demise*, when some of the brass section in the first take provided the rhythms in the first aleatory section by galloping on their chairs. During the second take, they were found more interesting sounds for that section. With enhanced performer engagement and more creativity on the composer's part, the music takes on a life of its own. This is partially because each performance has more opportunity to differ from previous and future performances, making each and every performance unique as the freedom delegated to the performers allows them to make something new in every performance. Sometimes these differences can be very small but in some cases they are quite substantial, particularly when using improvisation rather than controlled

⁵⁶ Lutosławski, W. (2007). *Lutosławski on Music*. (B. Skowron, Ed., & B. Skowron, Trans.) Lanham, Maryland, USA: Scarecrow Press, Inc, p. 99.

aleatoricism. Overall, however, the general outcome is predictable and one performance does not differ too much from other performances as a sonic whole.

Composition Projects

In the accompanying portfolio of original compositions, I have presented three of my works that utilise aleatory technique to various extents: a wind trio, *Seven Point Zero*, a large chamber ensemble work, *Portals*, and an orchestral work, *Our Own Demise*. Each of these works uses aleatoricism; however, the degree of use varies in each work. None of the works uses aleatory technique for the entirety of the composition; rather, it is used in combination with conventional music notation. *Seven Point Zero* was the first of the works I wrote for this project. In this piece, I restricted my use of aleatoricism to affect only ensemble coordination, similar to Lutosławski's use in the first movement of *Jeux Vénitiens*. In both *Our Own Demise* and *Portals*, however, I explored further options, extending my use of aleatoricism to include pitch, rhythm and timbre, but never allowing any chance element to influence the structure or the form of my works.

Seven Point Zero

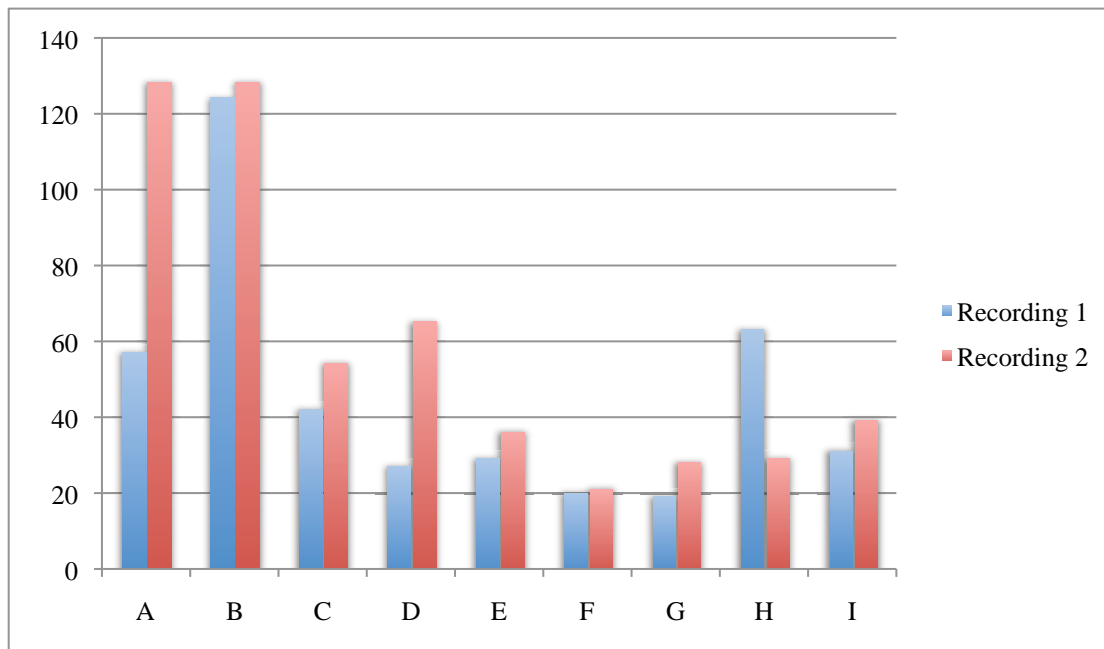
Seven Point Zero was the first of the three pieces I wrote for the accompanying portfolio. It is a wind trio for flute, clarinet and bassoon written for Ben Hoadley to incorporate as part of his New Zealand Music for Woodwinds concert in 2010. It was also workshopped later that year at the Nelson Composers Workshop and I have included both recordings in the portfolio. This piece alternates between aleatoricism and conventional notation in a quasi ABAB format, the former (A) being the aleatory sections and the latter (B) the fully specified sections. The use of aleatoricism is treated cautiously and its use is restricted to modules. Each module contains a musical

idea that is fully specified. The modules can be played in any order, however, and are repeated until the designated instrument gives the signal that the section has ended. The decision to move on is left to the discretion of the performer with the signal. This use of aleatoricism is similar to Lutosławski's use in his String Quartet, but uses it to a far lesser extent due to the notated sections dominating the work. The reason for applying aleatoricism in this work was as a device to create a particular atmosphere. Due to all the material being specified, the order of the material is of less importance. This lets the performers choose which modules to play while allowing them to respond and interact within the ensemble. The modules occur in a different order at every performance. Additionally, the tempo at which the modules take place differs. For example, in the first performance the performers move from module to module almost seamlessly after they enter, but in the second performance the performers take more time between modules, stretching the section by adding space. Regardless of the order or the tempo the modules happen, the overall atmosphere is achieved. The atmosphere is intended to create feelings of peacefulness with an underlying sense of uncertainty. Both recordings successfully convey this image despite their differences. The material in the aleatory sections is written with the least desirable outcome in mind—thus, in theory, no performance should result in an unwanted result.

The structure of the work is predominately ABAB but can be broken down into further sections to understand the macrorhythm of the work. Graph 8.1 shows the length of these sections. Sections A and C are the aleatory sections and the length of these sections have the potential to fluctuate as I did not specify the length of these sections, instead leaving the decision up to the performers. As can be seen by the graph, the length of section A is fifty-eight seconds in one performance and two

minutes, nine seconds in the other. Aside from these two sections, the rest of the work is written in conventional notation and metronome markings are specified. Similar to the macrorhythm found in Lutosławski's works, as the climax is approached the sections shorten. After this point the sections lengthen as the work moves towards the ending.

Table 9.1 – *Seven Point Zero*, macrorhythm of work



In *Seven Point Zero*, a limited amount of materials have been used. These materials are similar in both the aleatory sections and the conventionally notated sections. It is the integration of the different motifs and ideas that create a coherent work despite the sectional nature of the piece. Section A introduces material that recurs in the following sections where it is either developed or treated in a different manner—for instance, the quintuplet rhythm is introduced and becomes a significant element in the melodic lines in section B. The following section, B, introduces a microtonal melodic idea and gradually develops it rhythmically. This creates intensity both through the dissonant nature of the melodic material as well as the increasing rhythmic

complexity. The microtonal motif transforms from a slow moving line to dominating the pulse of this section underneath the melodic lines of the flute and clarinet. This motif, now established, is incorporated in modules in section C, the second aleatory section. Alongside it is the quintuplet motif, as well as descending sounds (downward scales), fast passages (trills and semiquaver groups) and dissonant bassoon multiphonics. After the previous two chaotic sections, the work takes a different character. Section D introduces a melody, which is developed from a unison line to a three-part chorale. This material continues to develop through sections E and F leading up to the climax at the end of this section. The clarinet uses the harmonic material from the melodic motif and presents it in tenuto crotchets leading the gradual *accelerando* from E until the end of F. The flute also uses the same motif, reintroducing it as it first appeared at figure D before integrating the pitch material with the triplet rhythm of the microtonal motif. As section F is the climactic section, a sense of propulsion to the climax is achieved firstly by a continuous *accelerando*, secondly by a *crescendo*, thirdly by the addition of the bassoon, and fourthly by the addition of accents and *sforzandos*. Section G moves away from the climax; unlike the rest of the work, where the pitch movement has been in a generally upwards direction, this section starts in a higher register. This releases tension as the piece moves away from a high point back to the melody (section H) that began the propulsion towards the climax. This time, however, the piece reverts back to the whistle-tone and subtone material from the very first section under a last reiteration of the melodic material from section B in a soft, low-register rendition.

Example 9.1 - *Seven Point Zero*, first occurrence of the quintuplet motif.



Example 9.2 - *Seven Point Zero*, unison line developing the quintuplet motif and introducing the triplet for the microtonal motif.

4 **B** $\text{♩} = 36$

The score consists of three staves. The top staff is in treble clef, the middle in alto clef, and the bottom in bass clef. The time signature is 3/8. The piece is marked with a tempo of quarter note = 36. The first two bars feature a quintuplet motif (marked with a '5' over the notes) and a triplet motif (marked with a '3' over the notes). The dynamics are *p*, *mf*, *mp cresc.*, and *f*. The last two bars feature a triplet motif (marked with a '3' over the notes) and a quintuplet motif (marked with a '5' over the notes). The dynamics are *mp cresc.*, *mf cresc.*, and *f*.

Example 9.3 - *Seven Point Zero*, final reiteration of the quintuplet motif (last four bars).

The score consists of a single bass clef staff. It features a quintuplet motif (marked with a '5' over the notes) and a triplet motif (marked with a '3' over the notes). The dynamics are *pp*.

Example 9.4 - *Seven Point Zero*, first occurrence of the microtonal motif.

The score consists of a single bass clef staff. It features a microtonal motif (marked with a sharp sign over the notes).

Example 9.5 - *Seven Point Zero*, development of the microtonal motif.

The score consists of a single bass clef staff. It features a development of the microtonal motif (marked with a sharp sign over the notes). The dynamics are *f*.

Example 9.6 - *Seven Point Zero*, development of the microtonal motif, final stage.



The pitch content of the material in this work derives from a single pitch-class set and its inversion. This was only a basis for the pitch content, however, and the scheme was not adhered to in a strict sense, allowing additional pitches when deemed necessary. The pitch-class set contains ic1, but when melodically articulated provides ic1 and ic2. This resulted in substantial use of the semitone and tone. As the pitch-class set does not always appear in its basic form, however, the addition of pitches outside the set allows other intervals to occur, changing its intervallic identity. Harmonic development is created by the accumulation of transformations of the pitch-class set, the twelve transpositions of the prime form and the twelve transpositions of the inverted form. This creates twenty-four pitch-class sets interrelated by a common intervallic structure, generating a coherent pitch scheme that unifies the work. The use of microtonality was not a harmonic decision; rather it is used as a device to create the desired atmosphere.

Example 9.7 - Pitch-class set used for *Seven Point Zero*

Prime form

P1 P2 P3 P4 P5 P6

P7 P8 P9 P10 P11 P12

Inverted form

I1 I2 I3 I4 I5 I6

I7 I8 I9 I10 I11 I12

Example 9.8 – Ordered pitch-class sets used for *Seven Point Zero*

The image displays 12 ordered pitch-class sets, labeled P1 through P12, arranged in four rows of two staves each. Each staff contains two measures of music. The notation is in a treble clef with a key signature of one flat (B-flat). The sets are as follows:

- Row 1: P1, P2, P3, P4, P5, P6
- Row 2: P7, P8, P9, P10, P11, P12
- Row 3: I1, I2, I3, I4, I5, I6
- Row 4: I7, I8, I9, I10, I11, I12

Movement towards to the climactic section is created not only by macrorhythm and the development of motivic ideas but also through the use of register and the number of melodic lines. This is particularly evident in the clarinet lines, such as in section A where the clarinet works its way from the lower chalumeau register through the clarion register and up to the altissimo register where it stays for section C. The flute and bassoon follow the clarinet's registral change through section B but to a lesser extent. Regardless, all three instruments are in their high registers for section C (with the exception of the multiphonics in the bassoon). This rise in intensity due to registral shift allows for a dramatic change at section D, where the flute and clarinet drop to their lower registers while the bassoon remains in the same register as the clarinet. The bassoon is kept in the tenor register for two reasons: the first to keep this section in a restricted register across the three instruments, the second to blend the tone colours of the clarinet and the bassoon, which I find gives a haunting tone. This

process is repeated during section E, where the flute gradually begins to expand the registral range while the bassoon and clarinet work around a similar register area.

The beginning of each section has a similar tendency in terms of the number of melodic lines. Sections tend to begin with a single idea, often in unison or in octaves and gradually expand into three separate lines. This happens at B, D and E–F. At B all three instruments state the melody in unison (flute an octave higher). By the sixth bar of figure B, the flute continues with the melody, the bassoon introduces the microtonal motif and the clarinet play a countermelody before joining in on the microtonal motif. At D, the melody is stated three times. The first statement is with all instruments in unison (flute an octave higher again). For the second statement, the flute restates the melody again slightly differently while the clarinet sustains only the first note of it. The bassoon has a combination of both, the melodic line in the first bar and a sustained note in the second bar. In the third statement the clarinet plays the main melodic line for the first two bars while the flute plays a slightly different version. In the last two bars of this third statement all three instruments depart from the original melody, playing three different versions simultaneously. The gradual move from one melodic line to three lines creates a teleological drive towards the next section. This is essential to creating a sense of trajectory over the course of the work.

Seven Point Zero, despite its aleatory nature, did not present any issues in the performance. The instructions on the score and parts were self-explanatory and the performers were able to rehearse and perform this work without any additional input from myself. This trio provided an opportunity to use aleatoricism with a small ensemble before attempting to apply similar techniques to the larger works.

Table 9.2 - *Seven Point Zero*, sectional analysis.

Section	Tempo	Dynamic	No. of lines	Length of section	
				Performance 1	Performance 2
A	Ad lib	pp; p; fp cresc mp decrec p	3	58"	2'09"
B	$\text{♩} = 36$	mp cresc fff	1; 3	2'05"	2'09"
C	Ad lib	fff	3	43"	55"
D	$\text{♩} = 36$	pp cresc f	1; 2; 3	28"	1'06"
E	accelerando	pp cresc	2	30"	37"
F (climax)	accelerando	f cresc; sfz	3	21"	22"
G	$\text{♩} = 36$	p cresc mp	3	20"	29"
H	$\text{♩} = 36$	mp cresc ff	2	1'04"	30"
I	$\text{♩} = 36$	pp	3	32"	40"

Portals

In early 2010 I was approached by the Silencio Ensemble to write a piece for a concert they were planning for September 2010 as part of the University of Canterbury Platform Arts Festival. The concert showcased a number of Christchurch composers with a variety of different approaches to composition and was performed by the Christchurch based ensemble. The Silencio Ensemble consists of both jazz and classical musicians and they predominantly perform New Zealand works, particularly the works of Christchurch composers. Because of the jazz background of some of their players, I was able to utilise aleatoricism and improvisation on a larger scale than in my other two works. *Portals* was later recorded with a different group of performers, again some of whom have a jazz background and some a classical background. Some of the instrumentation was changed for the purpose of this recording due to the availability of performers—for example, the alto flute has been

replaced with a clarinet. For this project I wrote a set of small pieces each based on a different photograph of a door, which was projected on a screen behind the ensemble during the performance. The title *Portals* refers to the idea that a door can lead anywhere, what is behind a door (particularly in a photograph) is up to the imagination. *Portal #1* is based on a photo of stone stairs leading down to an old wooden door. This photo conjured up images of Turkey, where it was taken, and perhaps there is a group of women behind this door, singing as they work. *Portal #2* is based on the front door of an old, potentially Gothic house. It is dark and reminds me of the haunted house around the corner from my childhood. *Portal #3* looks as though it is a warehouse flat filled with artists and musicians. It reminded me of my flat at the time, where everyone was either an artist or a musician. This is the most substantial of the four portals. The piece attempts to emulate the eclectic soundscape that I was living amongst: an early music enthusiast, a jazz trumpet and guitar player, a couple of composers and an artist who was always tuned to National Radio. *Portal #4* is of an alleyway somewhere in Christchurch. This piece was based on a short story that was inspired by the photo written by Katie Pickett.

*Clay bricks run towards the keystone.
Black lichen clings possessively, begging for entry through
black iron bars, but never should they find the keys for this chain.*

*A small green weed finds nourishment in cracks. Could anything
else inhabit such gloomy light, could anyone ever endure
this sparse cold and concrete.*

*White doors shine brightly in the distance, a beacon in the night
when the moon is high.*

*In the corner, leaning against leaky pipe and dead leaves, a young
man, still but for the flicker of an eyelid and a spilt Earl
Grey, a yellowing bruise tattooed on his cheek and blood.*

Photo 9.1 - Portal #1⁵⁷



Photo 9.2 - Portal #2⁵⁸



⁵⁷ Hextall, P. J. *untitled door*.

⁵⁸ Hextall, P. J. *untitled door*.

Photo 9.3 - Portal #3⁵⁹**Photo 9.4 - Portal #4⁶⁰**

Both aleatoricism and improvisation are quite different despite both having elements of chance. Improvisation can be described as aleatory as usually there are guidelines

⁵⁹ Hextall, P. J. *untitled door*.

⁶⁰ Hextall, P. J. *untitled door*.

and specified instructions to follow that can restrict the outcome and the chance elements are part of the performance process. However, the reverse is not true. Aleatoricism cannot be described as improvisation. For *Portals* both aleatoricism and improvisation are employed. In *Portal #1* these two techniques happen simultaneously. At figure A the double bass continues to improvise over a given scale. This continues through figure B, where the upper woodwinds enter with a melody. There are two instructions given to the performers: firstly, they are instructed to play the melody in their own time, repeating until signaled to stop; secondly, they must embellish the melody on each repeat using the scale given as a guideline. Here there is interaction between the aleatory element of desynchronisation and improvisation. This portal is based around this interaction, which provided very different results from different performers, which will be discussed further on.

The next portal, *Portal #2*, involves soloists improvising over a conventionally notated score. This time pitches are suggested in blocks of four and the improvisers are asked to treat each set of pitches as a chord and to move through the sets at their own discretion. *Portal #3* is, for the majority, conventionally notated; however, the lengths of the sections have been left up to the performer, specifically section A. The inclusion of the weather report brings with it certain aleatory elements. The pitch and the tempo at which the bassoon player reads it can vary the length of that section. Improvisation occurs at figure E and is over the B \flat blues. This occurs over a transcription of B.B. King's *Tired of Your Jive*. In *Portal #4*, the internal sections comprise aleatory modules; the first for solo alto flute (clarinet in recording 2) and the second creating desynchronisation between the lines, providing a chaotic version of the first section. Overall, each of the portals applies aleatoricism to a greater degree

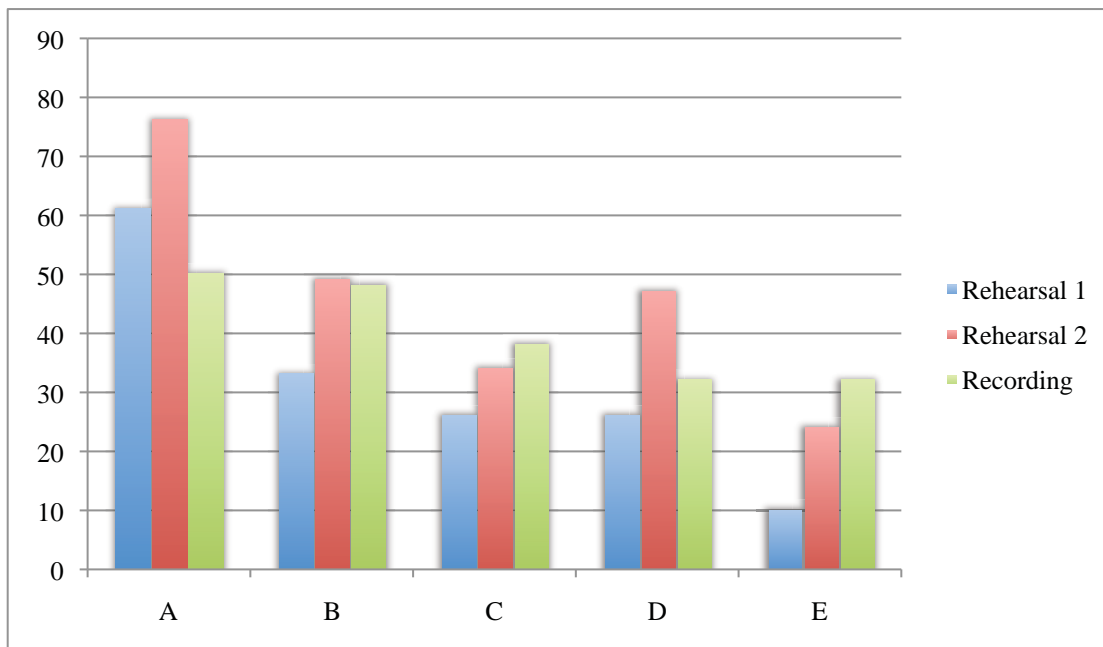
than *Seven Point Zero*, while exploring the use of improvisation within in a chamber ensemble context.

Each of the portals has very simple formal structures. *Portal #1* can be broken down into five sections all of which are based on the first. The formal structure can be described as: A–A1–A2–A3–Coda. The trajectory throughout the work is created not by macrorhythm such as in Lutosławski's works, but by a gradual addition of instruments. Each player excepting the double bass has the same melodic line as every other player, but due to the aleatory and improvisatory nature of the section, heterophony is created. *Portal #2* creates a trajectory through a gradual change of register. Almost all of the instruments move from their lower register into their upper register over the course of the piece. This registral change works alongside a continuous crescendo from *pp* to *fff*. The improvising soloists add to the intensity following both the registral and dynamic changes. *Portal #3* has an organic nature; it begins with an unmetered piano, which introduces the modal material that reoccurs at figures B and D; in between this, the weather report is read, spilling over into figure D. A similar technique is used between figures D and E and between E, F and G. The blues material of section E is brought in gradually, starting eight bars before figure E. At figure F, the remaining material is introduced in a similar manner. The concept behind this approach to the transitions of sections is the idea of moving around a house leaving behind one sound source only to run into another. Naturally there is always a slight overlay where both sound sources can be heard concurrently. The last portal, *Portal #4*, has a simple ABAB structure. The middle two sections are aleatory although despite this the B sections do not differ much. The use of simple structures

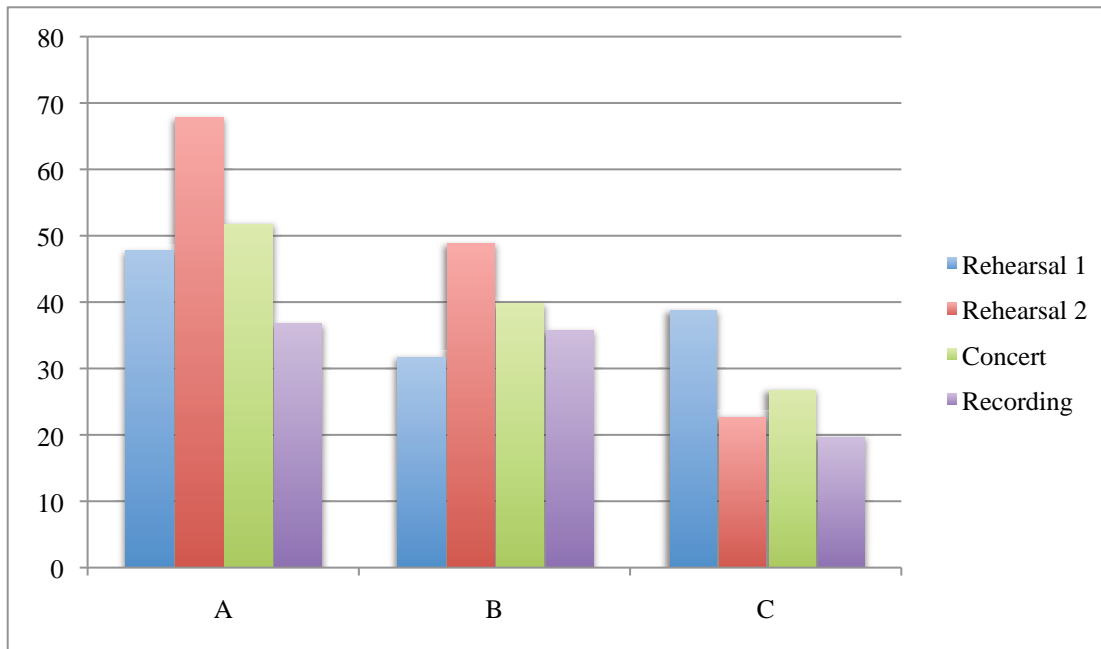
gave *Portals* an opportunity to be flexible and work easily with the improvisatory and aleatory nature of the piece.

Because of the simple structures used in each of the portals, the importance of macrorhythm is diminished. Due to the improvisatory nature of the work, the macrorhythm is of lesser importance, as there is nothing to dictate the length of each section. Below are graphs for each of the portals demonstrating the length of each section and how these differed from each performance/rehearsal. The recordings of the rehearsal have been provided on a separate CD. Each of the lengths of the sections has a similar outline, however the macrorhythm differs greatly in each recording. For example, in *Portal #1*, section A is the longest section in every recording; however, between rehearsal 2 and the recording there is a difference of 26 seconds.

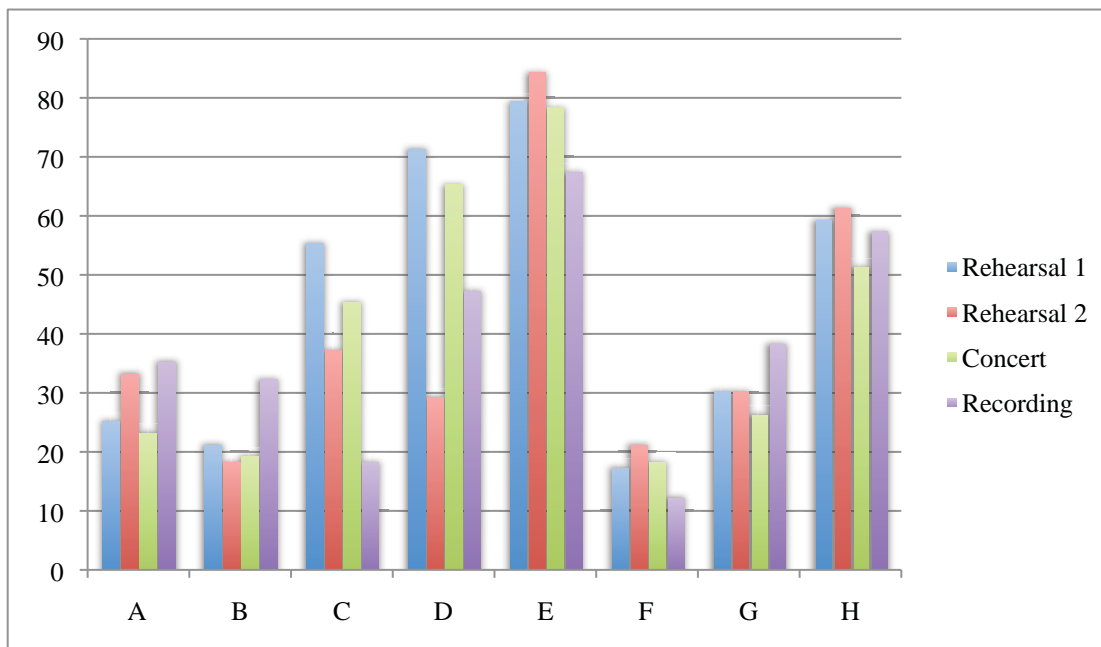
Graph 9.1 - Portal #1



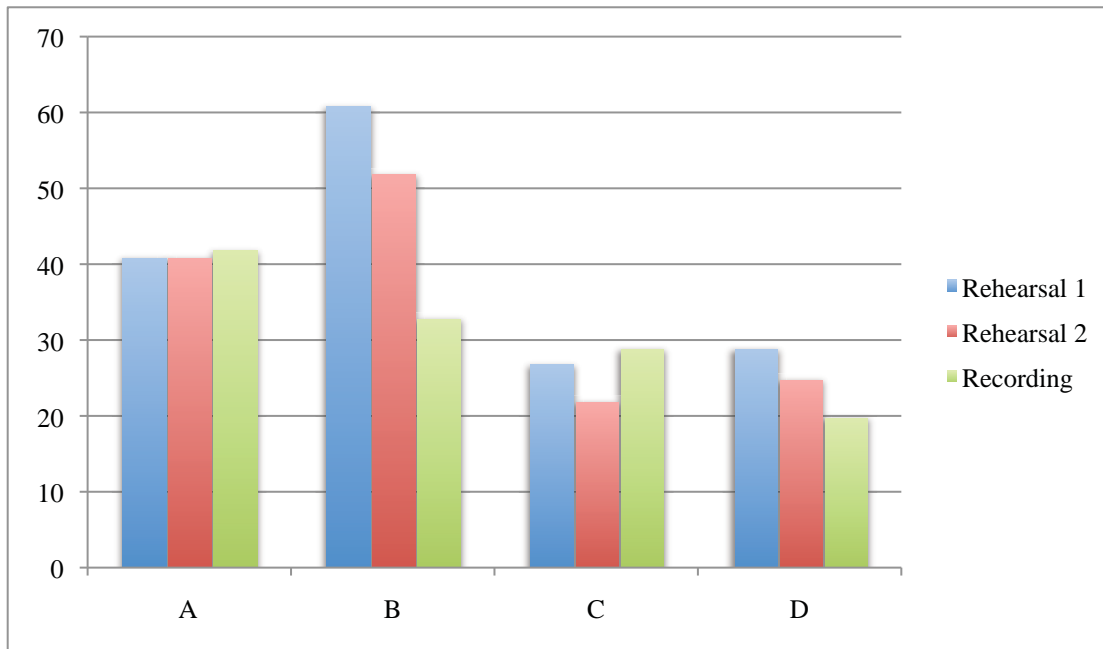
Graph 9.2 - Portal #2



Graph 9.3 - Portal #3



Graph 9.4 - Portal #4



This work was the most problematic when it came to the performance process. The backgrounds of the musicians in *Silencio* were varied and before the project I was given a sheet outlining each of the players skills in reading, range and improvisation. This was very helpful during the compositional process—for example, the double bass player was a skilled improvisator but did not read very well; consequently, the double bass part is largely improvised with a small amount of reading. The greatest challenge, however, was the rehearsal process. With so many aleatory and improvisatory elements, there was debate amongst the ensemble and conductor as to what exactly should happen. The jazz players took a considerable amount of liberty with the score, treating it more as a chart than a classical score. At the time I found this difficult to deal with, but with time and reflection I feel that my work was enhanced by the additional material that fused together both my sound world and that of the improvisers. The improvisers were not the only ones to make changes that differed from the score—the conductor added in triangle cues and changed the use of

the piano in *Portal #3* to a cymbal. Once again, although I was dubious at the time about these changes, looking back I find that it was exciting to be part of creative process while the performance was taking place. Despite the fact that I was based in Wellington while the rehearsals were taking place in Christchurch, I was in continuous contact with the conductor about the rehearsal process, including being sent the recordings of rehearsals. This did not replace my attendance at the rehearsals, however, which would have been preferable as I would have been able to talk with the players. On the other hand, it was an interesting experiment to observe the process from afar, allowing the performers to make their own decision regardless of my opinion on the matter. The fusion of the creative input from both the composer and the performer is an exciting idea, one that could be explored much further in my future work.

Our Own Demise

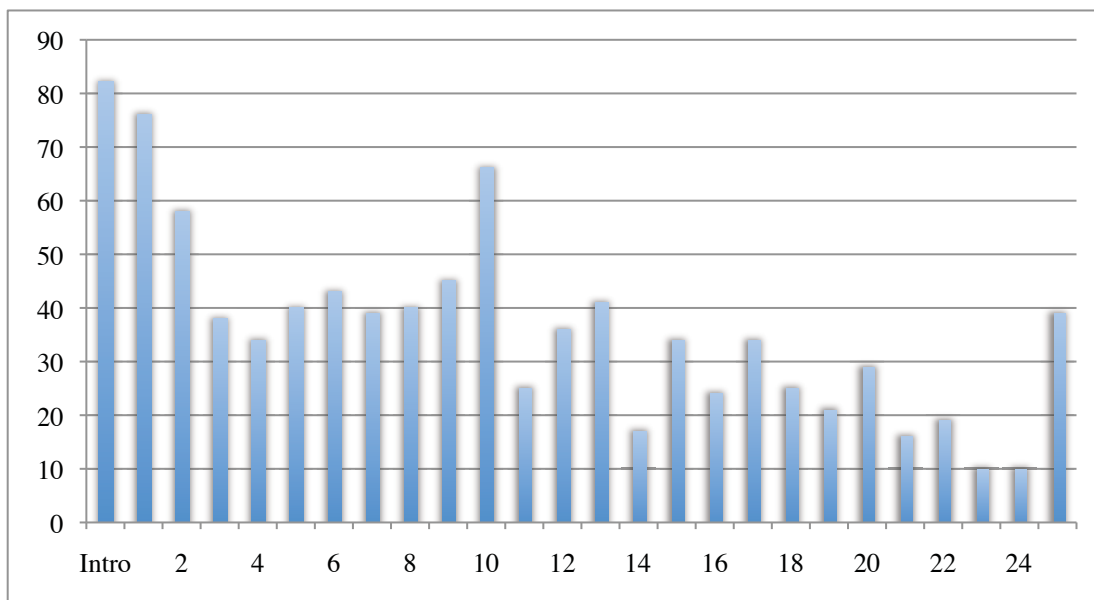
The second piece I wrote for this project was *Our Own Demise*, an orchestral work. This work is programmatic. It explores the transformation of human freedom from the beginning of the human species when only the laws of nature governed their lives. As society evolved and developed, the nature of freedom evolved and developed alongside it. Freedom became more specified and confined within certain parameters. Society eventually became industrialised, more mechanical, more controlled and more monitored. This is a romanticised vision of freedom. By exploring the nature of freedom in a political sense through music, the opportunity to utilise aleatoricism and indeterminate elements arose. *Our Own Demise* follows the nature of freedom in a musical sense to coincide with the political ideas that dictate the work. The piece

evolves from a free, largely undetermined section, where only rhythm is specified to a highly controlled and systemized conclusion. Aleatoricism is well suited to this work and was the inspiration for the conception.

Our Own Demise is structured in three main sections with an introduction and an epilogue. The first section is aleatory, the second soloistic and the third fully notated. At the end of the first section there is a quasi-climax leading into the second section. The distinction between the second and third sections is purposefully blurred as the material of the third section gradually takes over from the second. These sections however can be further subdivided, resulting in twenty-eight sub-sections. Over the course of the work the length of each sub-section gradually becomes shorter until the final few sub-sections last only eleven seconds (see graph 7.5). This assists in the creation of a sense of trajectory leading towards the ending.

Graph 9.5 - Macrorhythm of *Our Own Demise*

(x = sections, y = time in seconds)



Macrorhythmic control works in tandem with other musical parameters to create the trajectory. The use of orchestration and dynamics work together to assist with the creation of climaxes both at figure 11 and figure 27. The sections prior to the climaxes gradually build up to *f* (figure 11) or *ff* (figure 27). Often the dynamic levels are similar for consecutive sections, but a crescendo is achieved through the addition of instruments (see Table 7.4). This is certainly the case in the third major section but also true of the aleatory first section, which consists of eight aleatory blocks. As demonstrated by Table 7.3, there is a gradual accumulation of the instrument sections. Only in the eighth and final section does the orchestra play *tutti*. Prior to this there is always a group that is *tacet* for a particular section allowing the gradual buildup.

Table 9.3 - Orchestration of the eight blocks in the aleatory first section

	1	2	3	4	5	6	7	8
Woodwind				■		■		■
Brass	■	■	■		■		■	■
Percussion				■		■		■
Strings		■	■		■	■	■	■

The first part of *Our Own Demise* (excepting the introduction, figures 1–3) comprises a block of aleatory sections gradually building up to the second part (figure 12). Figure 3 requires the performers to control every musical parameter except rhythm. Nine rhythmic motives are given for the performers to move through while choosing their individual sound. There is to be no pitch except in extreme registers where it is hard to distinguish pitch, and ideas for sounds are given, such as tongue rams, slap tongues, mouthpiece/reed squeaks, key percussion, multiphonics, hitting instruments, pizzicato, snap pizzicato and *col legno*. This section has the potential to differ greatly in performance and provides an interesting and engaging beginning to the work allowing the introduction of pitch to develop and evolve the texture. The following aleatory sections are fully specified with the exception of ensemble coordination.

These sections are alternated and gradually accumulate to build the first quasi-climax (figure 12).

The rhythms used at figure 3 are the basis of the woodwind and percussion material throughout the rest of the aleatory sections. Later, in the fully notated part, they form the basis of all the rhythmic material, although they are subjected to developmental procedures and differ from the basic form (see Example 9.9). This rhythmic material, when used in the aleatory sections, creates a sense of rhythmic activity and assists in propelling the first part towards the quasi-climax. Because of its function, the woodwind and percussion do not enter until figure 7 after the static blocks of brass chords and string glissandi.

In order to create cohesion between the separate blocks divided by instrument families, similar pitch material is used. All pitch material is derived from the same ordered interval-class set containing ic2, ic1, ic3 and ic1 in that order. The pitch material of the brass, woodwind and percussion originates from the prime form of the interval-class set and its transpositions (Example 9.10), while the strings' pitch material is based on the inverted pitch-class set and its transpositions (Example 9.11). The pitch material of the entire work is based on this interval-class set with the exception of the introduction. This unifies the aleatory and fully notated sections, creating a sense of continuity through the work.

Table 9.4 - *Our Own Demise*

Fig.	Section	Dynamic	Orchestration	
1	Introduction	pp cresc mp	gradual colour crescendo to tutti	
2		mp cresc ff		
3	First	ad lib.	Tutti	
4		p decresc niente	Brass	
5		p decresc niente; p	Brass + strings	
6		p cresc f	Brass + strings	
7		mp	Woodwind/percussion ⁶¹	
8		mf decresc niente; f	Brass + strings	
9		f	Strings + woodwind/percussion	
10		p decresc niente; p	Brass + strings	
11		quasi climax	f	Woodwind/percussion + brass + strings
12		Second	p; pp	Solo violin + strings
13	p; pp		Solo violin + solo viola + strings + upper woodwind	
14	p; pp		Solo violin + solo viola + strings + upper woodwind	
15	f; pp		Low woodwind + solo violin + solo viola + strings	
16	f; pp		Low woodwind + strings	
17	f; pp		Solo violin + solo viola + strings	
18	p cresc mf cresc f		Woodwind + trumpets + trombones + strings	
19	f decresc mf decresc mp decresc p decresc pp; f		Woodwind + trumpets + trombones + strings	
20	f		Oboe 1 + clarinet 2 + lower woodwind + horns + celli + double bass	
21	f; mf		woodwind + horns + percussion + celli + double bass	
22	f		woodwind + horns + percussion + celli + double bass	
23	f		tutti	
24	Third	p	Flutes + piccolo + oboe 1 + clarinet 1 + upper strings	
25		f	upper woodwind + horns + trumpets + trombones 1 & 2 + percussion + strings (except double bass)	
26		mp cresc sfz	upper woodwind + bass clarinet + bassoon 1 + strings (except double bass)	
27		ff	tutti	
28	Epilogue	mp; pp ff decresc pp on final chord	solo trumpet + strings (tutti on final chord)	

⁶¹ The percussion section is treated as an extension of the woodwind section.

Table 9.5 - Rhythm complexity chart

Example 9.9 – Pitch-class sets with interval-class sets (2, -1, 3, -1), prime form (brass, woodwind and percussion)

Example 9.10 - used for *Seven Point Zero* (-2, 1, -3, 1), inverted form (strings)

Our Own Demise was rehearsed and performed twice. The first performance the orchestra rehearsed over a number of weeks before performing it in concert. The second was a hasty gathering of an orchestra, a quick run-through and then a recording. In both cases, however, the rehearsal process was more directed towards notational errors in the parts, which could have easily been avoided had the parts been more carefully checked. As performance directions were provided, the aleatory sections were quickly understood and achieved. The conductor holding up large numbers at the rehearsal marks solved the problem of a single downbeat at the beginning of each section. During the second performance the conductor used his fingers to indicate sections.

The issues that arose during the composition of *Our Own Demise* were largely compositional and typesetting ones. The importance of creating unity within a work that contained both aleatoricism and conventional notation was crucial. As discussed above this was achieved through the use of pitch and rhythmic material. The typesetting issues were not exactly a problem but the creation of aleatory section in a bar-based program, such as Sibelius, just meant that it took a lot longer in comparison to the conventionally notated sections.

Conclusion

Aleatory music stems from the European branch of indeterminate music; that is, it applies chance techniques during the performance process rather than during the compositional process. The degree of chance elements in the composition varies depending on composer and/or work. Both Lutosławski and I applied chance to the synchronisation of the ensemble. I proceeded further and employed chance on other musical parameters, such as timbre and pitch, as well adding more substantive improvisational sections.

Aleatoricism is a technique that originated in the 1960s but remains timely today. Composers both overseas and in New Zealand experiment with aleatory technique for various reasons. A few adopt a political stance towards the liberation of the performer from the strictures imposed by the conductor and composer. Some are attracted to the collaborative nature of aleatory music. For others, it is purely a way to create rhythmically complex and dense textures. Regardless of the reasoning behind the use of aleatoricism, the fact that it is still being used demonstrates that it is a significant compositional technique and one I plan to develop for years to come.

The study of aleatory technique specifically from a composer's point of view is still a largely untouched field with many avenues for future research. This study focused on the use of aleatoricism in a restricted environment: Lutosławski uses a very limited version of aleatoricism and my use only extends it a little further. A more radical aleatory approach might include allowing chance into the structure and form of a

work. It would be interesting to research the impact of more extreme versions of aleatoricism, perhaps applying it to various parameters simultaneously.

Bibliography

- Anhalt, I. (c.1984). *Alternative voice: essays on contemporary vocal and choral composition*. Toronto: University of Toronto Press.
- Baranski, Z. G., & West, R. J. (Eds.). (2001). *The Cambridge Companion to Modern Italian Culture*. Cambridge: Cambridge University Press.
- Bernard, J. W. (1987). "Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution". *Music Analysis*, 6 (3), 207–236.
- Bernard, J. W. (1994). "Voice Leading as a Spatial Function in the Music of Ligeti". *Musical Analysis*, 13 (2/3), 227–253.
- Bodman Rae, C. (1986). "Lutosławski's Golden Year". *The Musical Times*, 127 (1723), 547–551.
- Bodman Rae, C. (1999). *The Music of Lutosławski* (3rd Edition). London: Omnibus Press.
- Bodman Rae, J. C. (1992). *Pitch Organisation in the Music of Witold Lutosławski Since 1979*. PhD Thesis. Leeds: University of Leeds.
- Boulez, P., Noakes, D., & Jacobs, P. (1964). "Alea". *Perspectives of New Music*, 3 (1), 42–53.
- Brindle, R. S. (1987). "Indeterminacy, Chance, and Aleatory Music" in *The New Music: The Avant-Garde Since 1945* (2nd ed.). Oxford: Oxford University Press.
- Brown, E. (1986). "The Notation and Performance of New Music". *The Musical Quarterly*, 72 (2), 180–201.
- Butchers, C. (1968). "The Random Arts: Xenakis, Mathematics and Music". *Tempo, New Series* (85), 2–5.
- Cage, J. (1961). *Music of Changes*. New York: Henmar Press.

- Casken, J. (1986). "Review: Lively Lutosławski". *The Musical Times*, 127 (1718), 208–209.
- Casken, J. (1981). "Review: Polish Master". *The Musical Times*, 122 (1666), 822–823.
- Clark, R. C. (1970). "Total Control and Chance in Musics. Part II. Reflections on Criticism and Judgement". *The Journal of Aesthetics and Art Criticism*, 29 (1), 43–46.
- Clark, R. C. (1970). "Total Control and Chance in Musics: A Philosophical Analysis". *The Journal of Aesthetics and Art Criticism*, 28 (3), 355–360.
- Cope, D. (1971). *New Directions in Music*. Dubuque, Iowa: WM. C Brown Company Publishers.
- Dunsby, J. (1989). "Considerations of Texture". *Music & Letters*, 70 (1), 46–57.
- Ehle, R. C. (1979). "From Sound to Silence: The Classical Tradition and the Avant-Garde". *Music Educators Journal*, 65 (7), 36–41.
- Griffiths, P. (1997). *György Ligeti* (Second Edition ed.). London: Robson Books.
- Griffiths, P. (1981). *Modern Music: The Avant Garde Since 1945*. London: J. M. Dent & Sons Ltd.
- Griffiths, P. (1972). "Morton Feldman". *The Musical Times*, 113 (1554), 758–759.
- Griffiths, P. (n.d.). "Aleatory". *Oxford Music Online*. Retrieved 06/30/2011, from Grove Music Online:
<http://www.oxfordmusiconline.com/subscriber/article/grove/music/00509>
- Griffiths, P. (1975). "Xenakis: Logic and Disorder". *The Musical Times*, 116 (1586), 329–331.
- Grout, D. J., & Palisca, C. V. (1996). *A History of Western Music* (5th Edition ed.).

- Halski, C. (1973). "Poland". In F. W. Sternfeld (Ed.), *Music in the Modern Age*. London: Weidenfield & Nicolson, p. 47-70.
- Hamilton, A. (2002). *The Music of Chance: Musical Dice Men from John Cage to John Zorn*. (R. Young, Ed.) New York: Continuum Books.
- Harley, J. (2004). *Xenakis: His Life in Music*. New York: Routledge.
- Hays, W. (1972). *Twentieth-century views of music history*. Ann Arbor. University of Michigan.
- Hines, R. S. (Ed.). (1970). *The Orchestral Composer's Point of View: Essays on Twentieth-Century Music by Those Who Wrote It*. University of Oklahoma Press.
- Homma, M. (1991). "'Bird's-eye view' and 'key ideas': On Aspects of Lutosławski's Compositional Technique As Seen in the Sketches". *Musik-Konzepte* (71-73), 33–51.
- Homma, M. (1995). "The Reception of Polish Music in Germany". *Krakow: Music Jagellonica*, 233–259.
- Homma, M. (1995). *Witold Lutosławski: Twelve-tone harmony, formal construction, 'aleatoric counterpoint' – Studies of the Complete Works, including the sketches*. Köln, Germany: Universitat zu Köln.
- Hoogerwerf, F. W. (1976). "Cage Contra Stravinsky, or Delineating the Aleatory Aesthetic". *International Review of the Aesthetics and Sociology of Music*, 7 (2), 235–247.
- Jacobson, B. (c.1996). *A Polish Renaissance*. London: Phaidon.
- Jarocinski, S. (1965). "Polish Music after World War II". *The Musical Quarterly*, 51 (1), 244–258.
- Jones, K. (1981). "Compositional Applications of Stochastic Processes". *Computer Music Journal*, 5 (2), 45–61.

- Ligeti, G. (1978). "On Music and Politics". *Perspectives of New Music*, 16 (2), 19–24.
- Ligeti, G., & Bernard, J. W. (1993). "States, Events, Transformations". *Perspectives of New Music*, 31 (1), 164–171.
- Lutosławski, W. (1968). "About the Element of Chance in Music". *Three Aspects of New Music: From the Composition Seminar in Stockholm*, 45–54.
- Lutosławski, W. (2007). *Lutosławski on Music*. (Z. Skowron, Ed., & Z. Skowron, Trans.) Lanham, Maryland, USA: Scarecrow Press, Inc.
- Matassian, N. (1986). *Xenakis*. New York: Taplinger Publishing Co, Inc.
- Meyer, L. B. (1963). "The End of the Renaissance?" *The Hudson Review*, 16 (2), 169–186.
- Meyer-Eppler, W. 1957. *Statistic and Psychologic Problems of Sound*, translated by Alexander Goehr. Die Reihe 1 (*Electronic Music*): 55-61. Original German edition, 1955, as *Statistische und psychologische Klandprobleme*, Die Reihe 1 (*Electronische Musik*): 22-28.
- Michaux, H. (1951). *Selected Writings: The Space Within*. (R. Ellman, Trans.) New York: New Directions.
- Nadeau, R. (1981). "Crisis of Tonality: What Is Avant-Garde?". *Music Educators Journal*, 67 (7), 36–41.
- Nikolska, I. (c1994). *Conversations with Witold Lutosławski (1987-92)*. (V. Yerokbin, Trans.) Stockholm, Sweden: Melos.
- Nordwall, O. (1969). "György Ligeti". *Tempo, New Series* (88), 22–25.
- Osborne, N. (1979). "Review: [untitled]". *Music & Letters*, 60 (2), 218–220.
- Parsons, M. (1968). "Sounds of Discovery". *The Musical Times*, 109 (1503), 429–430.

- Pirie, P. J. (1974). "Review: Modern Orchestral". *The Musical Times*, 115 (1574), 310–311.
- Rahn, J. (2001). "Iannis Xenakis: Regard, Disregard: Liberation". *Perspectives of New Music*, 39 (1), 211–214.
- Reiprich, B. (1978). "Transformation of Coloration and Density in György Ligeti's *Lontano*". *Perspectives of New Music*, 16 (2), 167–180.
- Reyland, N. (2007). "Lutosławski, 'Akcja', and the Poetics of Musical Plot". *Music and Letters*, 88 (4), 604–631.
- Riley, H. (1966). "Aleatoric Procedures in Contemporary Piano Music". *The Musical Times*, 107 (1478), 311–312.
- Riley, H. (1966). "Aleatory Procedures". *The Musical Times*, 107 (1482), 686.
- Rosenstiel, L. (1982). *Schirmer History of Music*. New York: Schirmer Books.
- Rust, D. (1995). "Conversation with Witold Lutosławski". *The Musical Quarterly*, 79 (1), 207–223.
- Schwartz, E., & Daniel, G. (1993). *Music Since 1945*. NY: Schirmer Books.
- Selleck, J. (1975). "Pitch and Duration as Textural Elements in Lutosławski's String Quartet". *Perspectives of New Music*, 13 (2), 150–161.
- Smith, S. S. (1994). "Against Definition". *Perspectives of New Music*, 32 (1), 214–218.
- Steinitz, R. (2003). *György Ligeti: Music of the Imagination*. London: Faber and Faber Ltd, London.
- Stucky, S. (1981). *Lutosławski and his Music*. Cambridge, UK: Cambridge University Press.
- Taruskin, R. (2005). *The Oxford History of Western Music*. New York: Oxford University Press.

- Thomas, A. (2000). “*Jeux Vénitiens: Working Methods at the Beginning of Lutosławski’s Mature Period*”. *Krakow: Musica Iagellonica*, 255–287.
- Thomas, A. (2005). *Polish Music Since Szymanowski*. Cambridge: Cambridge University Press.
- Várnai, P., Häusler, J., & Samuel, C. L. (1983). *György Ligeti in conversation with Péter Várnai, Josef Häusler, Claude Samuel, and himself*. London: Eulenburg.
- Varga, B. A. (1976). *Lutosławski Profile: Witold Lutosławski in conversation with Bálint András Varga*. London: J. & W. Chester/Edition Wilhelm Hansen London Ltd.
- Varga, B. A. (1976). *Lutosławski in Conversation with Bálint András Varga*. London: Chester Music.
- Xenakis, I. (1992). *Formalized Music: Thought and Mathematics in Composition*. Pendragon Press.
- Xenakis, I. (1966). “The Origins of Stochastic Music”. *Tempo, New Series* (78), 9–12.

Scores

- Lutosławski, W. (c.1988). *Chain 3: for Orchestra (score)*. London: Chester Music.
- Lutosławski, W. (1963). *Five songs for female voice and 30 solo instruments after poems by Kazimiera Illakowicz*. Celle: Moeck Verlag.
- Lutosławski, W. (c.1962). *Jeux vénitiens : pour orchestre = Venetian Games : for Orchestra* . Celle: Moeck.
- Lutosławski, W. (Composer). (2000). Lutosławski Orchestral Works inc Symphonies Nos 1 & 2. [P. R. Orchestra, Performer, & W. Lutosławski, Conductor] [CD]. EMI.
- Lutosławski, W. (c.1958). *Muzyka Zalobna, na Orkiestre Smyczkowa = Musique Funèbre, pour orchestre a cordes (score)*. Krakow: Polskie Wydawnictwo Muzyczne.
- Lutosławski, W. (c. 1972). *Trois poèmes d'Henri Michaux*. London: Chester Music
- Lutosławski, W. (1970). *String Quartet (1964) (2nd Edition ed.)*. London: Chester Music.
- Lutosławski, W. (1970). *String Quartet (score) (2nd Edition ed.)*. London: Chester Music.
- Lutosławski, W. (1968). *Symphony no. 2 (score)*. London: Chester Music.

Discography

- Dutilleux, H., & Lutosławski, W. (Composers). (2002). Dutilleux; Lutosławski Cello Concertos. [M. Rostropovich, O.D. Paris, Performers, S. Baudo, & W. Lutosławski, Conductors] [CD]. EMI.
- Lutosławski, W. (Composer). (1999). Essential Lutosławski. [B. P. Orchestra, P. N. Orchestra, M. Argerich, N. Freire, H. Schiff, B. R. Orchestra, et al., Performers, W. Lutosławski, & W. Rowicki, Conductors] [CD]. Philips (Universal Music).
- Lutosławski, W. (Composer). (2000). Lutosławski Orchestral Works inc Symphonies Nos 1 & 2. [P. R. Orchestra, Performer, & W. Lutosławski, Conductor] [CD]. EMI.
- Lutosławski, W. (Composer). (2004). Orchestra Works; Chamber Works. [W. Lutosławski, Conductor] [CD]. EMI.
- Lutosławski, W. (Composer). (1996). Orchestral Works. [A.-S. Mutter, P. B. Moll, Performers, & W. Lutosławski, Conductor] [CD]. Deutsche Grammophone.
- Lutosławski, W. (Composer). (2008). Symphonies 1 & 2; Concerto for Orchestra etc. [P. R. Orchestra, Performer, & W. Lutosławski, Conductor] [CD]. EMI.
- Stockhausen, K. (Composer). Stockhausen Momente. [G. Davy, H. West German Radio Chorusl Boje, R. Smalley, M. V. Ensemble, Performers, & K. Stockhausen, Conductor] Stockhausen-Verlag.

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