

# CODING LIVECODING

Ben Swift

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Australian  
National  
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```
;; Another Late Christmas  
;; Ben Swift
```

# Another Late Christmas

Ben Swift

<http://vimeo.com/86664303>

# LIVECODING

- live, code-based musical improvisation
- about a decade old
- several different software environments exist
- visit [toplap.org](http://toplap.org) for more info

# CODE AS INSTRUMENT

- central tenet: **the code is the instrument/  
interface**
- livecoders are *expert* users of this 'interface'
- the videos allow us to see artists at work
- what can we say about 'style' in livecoding?

# A DATA-DRIVEN APPROACH

```
(λ (beat dlist pitch slist)
  (if (car slist)
      (play piano (pc:relative pitch (car slist) (scale beat)) (random 60 80))
      (car dlist)))
(callback (*metro* (+ beat (* .5 (car dlist))) loop2 (+ beat (car dlist)))
  (rotate dlist -1) pitch
  (rotate slist -1)))

(loop2 (*metro* 'get-beat 12) '(1 1/2 1/2 1/2 1/2) 63 '(2 1 2 0 #f))

(define bassline
  (λ (beat dur)
    (play tuba (+ 36 (car s)) 80 dur)
    (callback (*metro* (+ beat (* .5 dur))) 'bassline (+ beat dur) dur)))

(bassline (*metro* 'get-beat 12) 12)
```

- put together a corpus of livecoding videos
- watch them frame-by-frame
- manually record **every edit**, both *textual* and *musical* aspects

# CHOOSING A CORPUS

- requirements: video must start from a blank screen, be high-quality (not a shakycam at a gig) and be an 'artistic' work (not a tech demo)
- comparatively few videos satisfied all these criteria
- in the end, we chose **13 pieces** by **2 artists** - Andrew Sorensen (9 pieces) and Ben Swift (4 pieces) who both use the *Impromptu* livecoding software environment

# CODING SCHEME

timestamp	to nearest second
<b>textual</b> meaning	was text <b>inserted, deleted, evaluated</b> , or a <b>‘quick edit’</b> (one-
<b>musical</b> meaning	did the change affect the <b>pitch, rhythm, dynamics, timbre</b> , or <b>all</b> of the above?
instrument	e.g. <b>bass, drums, piano</b> , etc.
comment	any other salient features of this edit

```

(define loop1
  (λ (beat dur)
    (play piano (if (= (modulo beat 12) 0) 67 (random '(60 60 60 58))) 50 dur)
    (callback (*metro* (+ beat (* .5 dur))) 'loop1 (+ beat dur) dur)))

(loop1 (*metro* 'get-beat 3) 1)

(define scale
  (λ (beat)
    '(0 2 3)))

(define loop2
  (λ (beat dlist pitch slist)
    (if (car slist)
      (play piano (pc:relative pitch (car slist) (scale beat)) (random 60 80)
        (car dlist)))
    (callback (*metro* (+ beat (* .5 (car dlist)))) 'loop2 (+ beat (car dlist))
      (rotate dlist -1) pitch)))

```

\* gig-utility.xtm Extempore 7098 +5 pe

11:05 0.93

10 : 0 Top

timestamp

**textual**  
edit type

**musical**  
edit type

instrument

comment

1:24

insertion

pitch

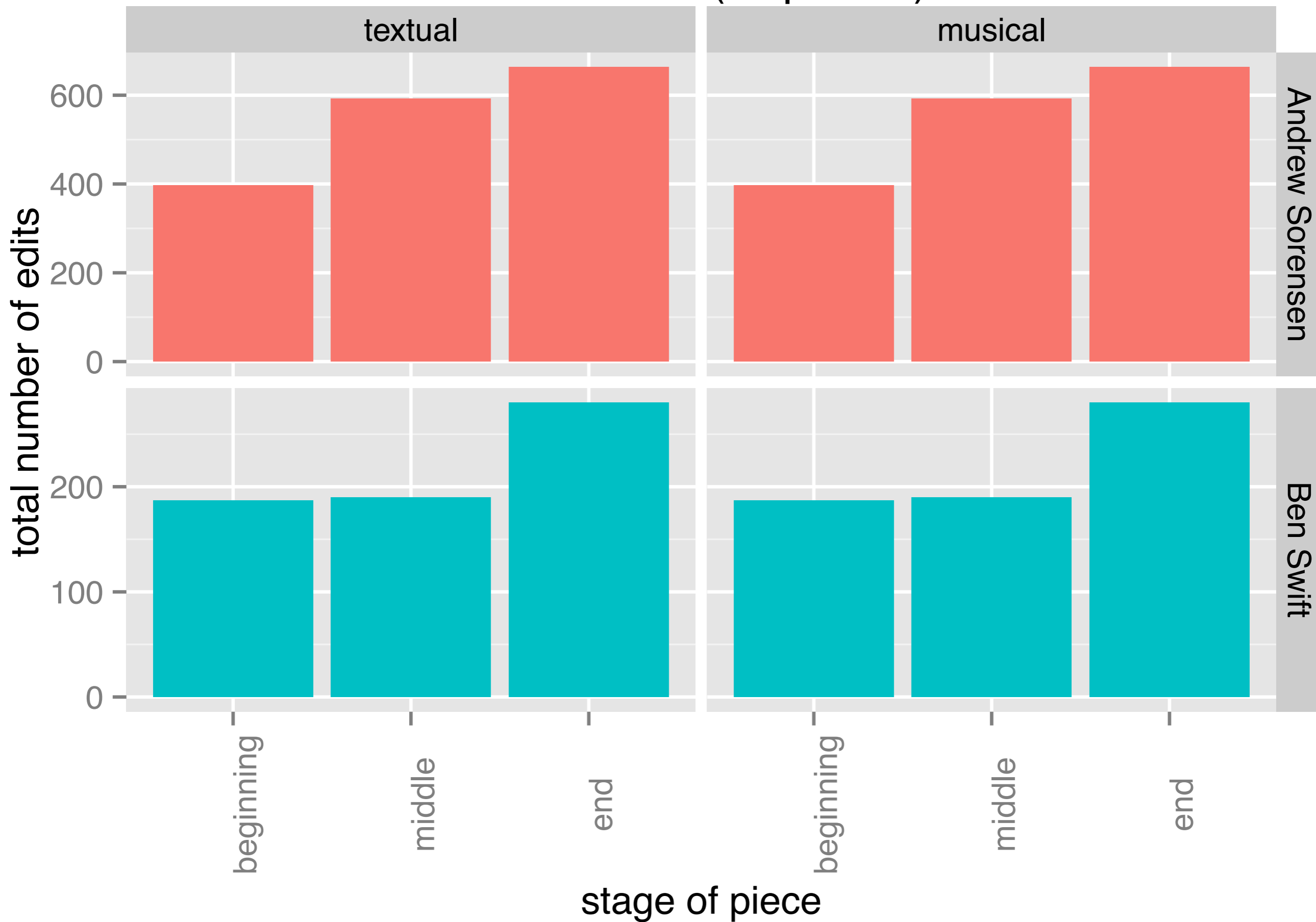
piano

scale change

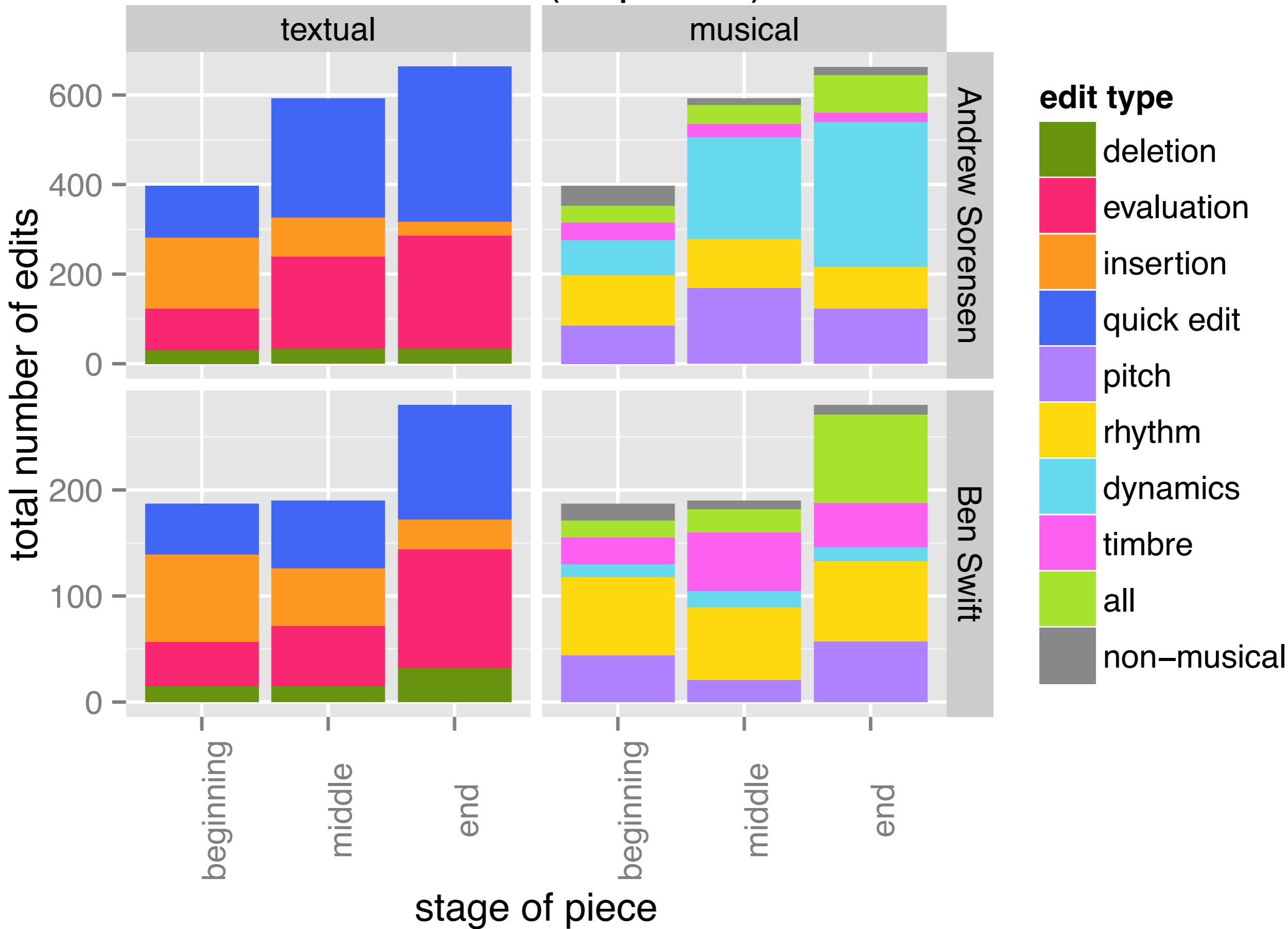
# RESULTS

- 13 livecoding videos transcribed (~3 hours total)
- the analysis was done by a professional music composer & arranger with a CompSci degree
- 2577 edit events
- average 15 edits/minute
- transcription time: 50+ hours!

# Edit counts (all pieces)



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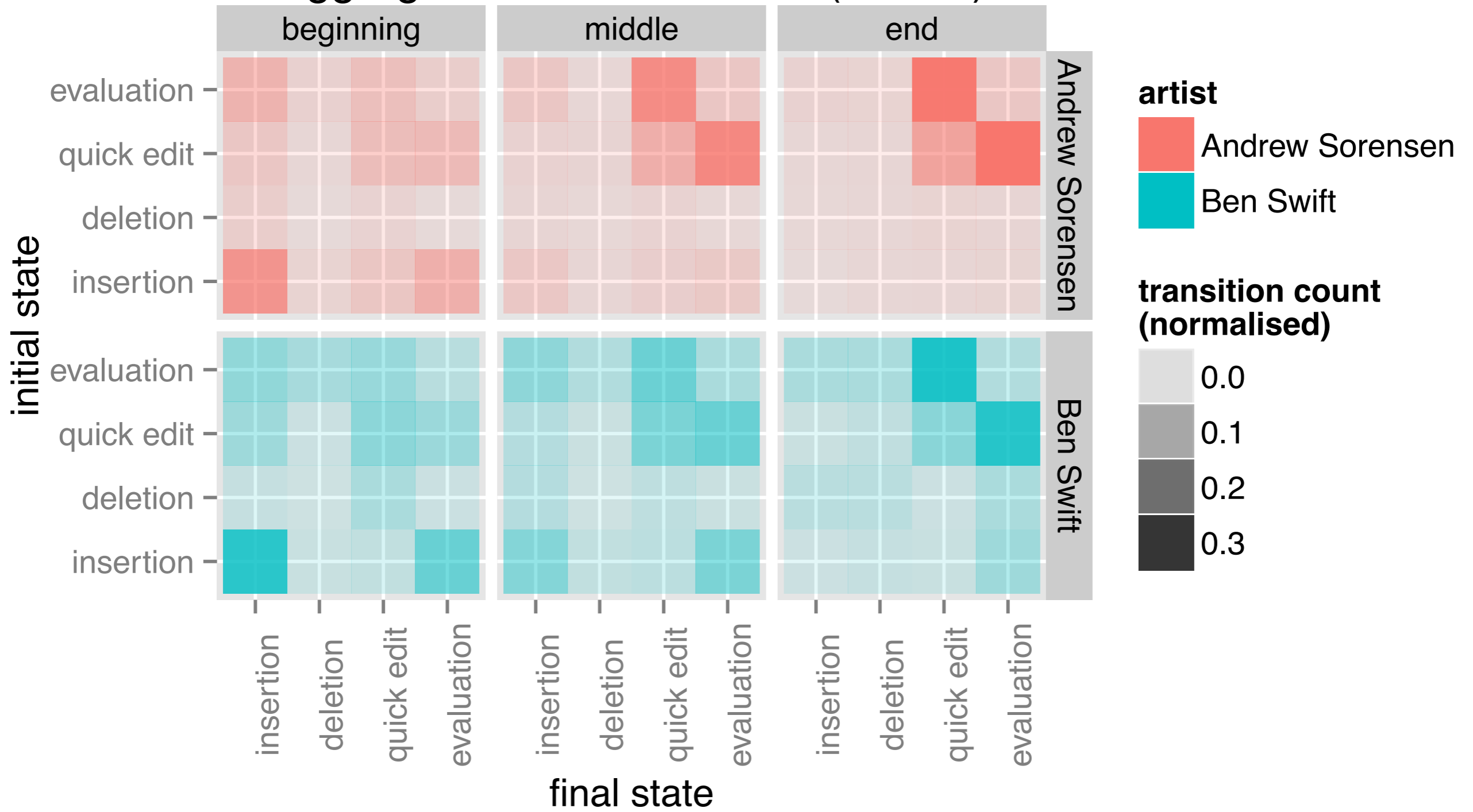


not just individual events, but  
the event **transitions**...

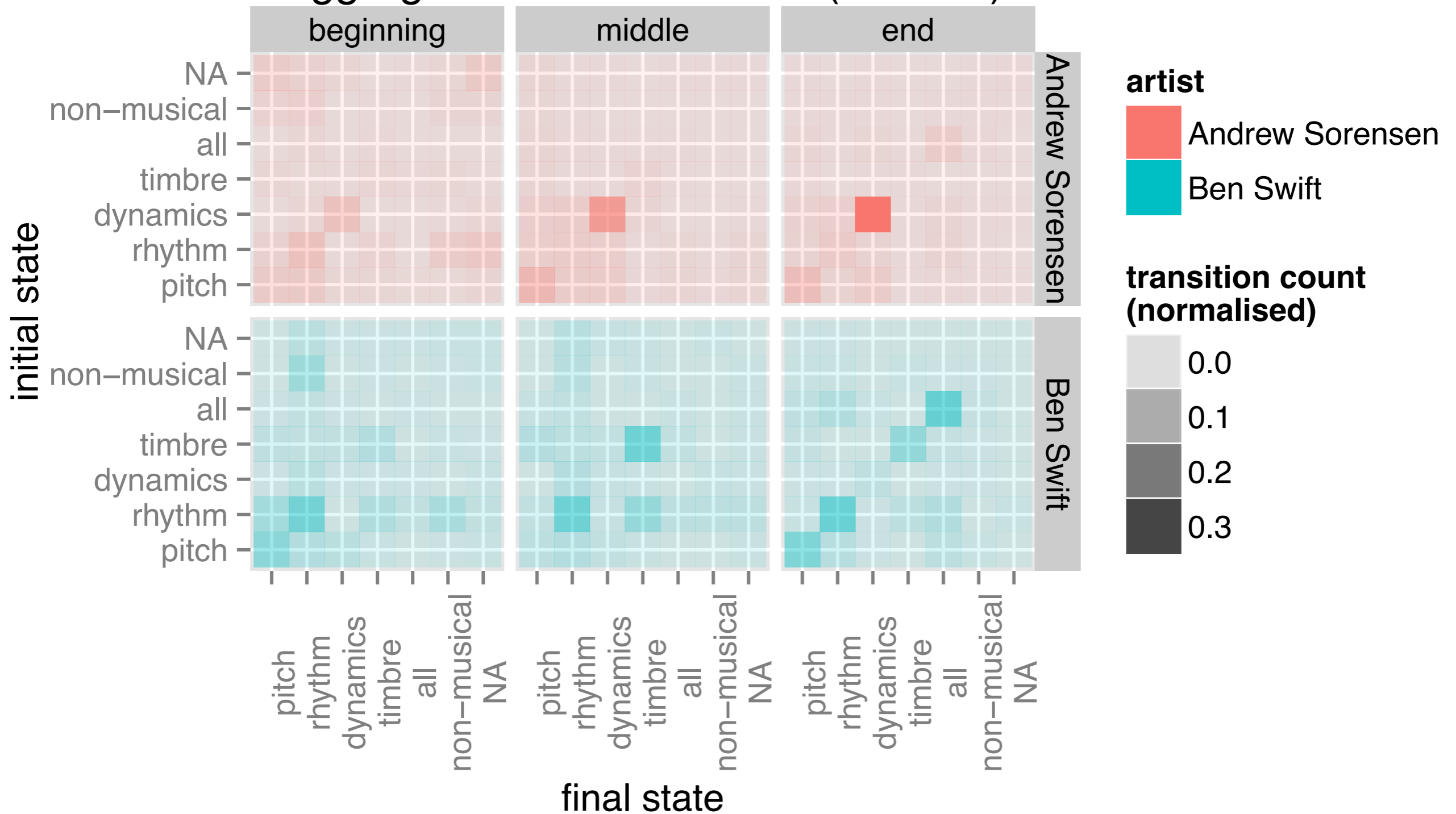
# TRANSITION MATRICES

- **$n \times n$  matrix**, where  **$n$**  is the number of event types ( $n = 4$  for textual,  $n = 6$  for musical)
- value in position ( **$i$** ,  **$j$** ) is the number of times event  **$i$**  was followed by event  **$j$**  (normalised  $\in [0, 1]$ ) in a given time window

# Aggregate transition matrix (textual)



# Aggregate transition matrix (musical)



stylistic differences can be seen not in textual editing patterns, but in the **musical meaning** of these edits

***for more information...***

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