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THE FOUNDATIONS OF SPEECH-MELODY COMPOSITION AND THE DAWN OF THE DIGITAL MUSIC ERA

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ABSTRACT

Speech is a part of our everyday lives, it's all around us everywhere we go. Since the beginning of recorded music, composers have been seeking new ways to incorporate speech into their works; from the tape loops of Steve Reich in the 1960s, to Peter Ablinger's works through the 2000s. This paper explores the emergence of speech-melody composition in the early 1980s in the works of Scott Johnson (*John Somebody 1*982) and Steve Reich (*Different Trains 1*988). Johnson assembled *John Somebody* entirely in the analogue domain, while Reich utilised a combination of analogue and digital technologies to create *Different Trains*. These two works then, sit at the transition between analogue and digital approaches to using technology as a compositional tool. The paper examines the composers' processes in determining melodic, harmonic and rhythmic content from speech and the influence of shifting technological advances upon them. The discussion takes place in the context of the advent of digital audio in commercial products such as samplers *E-MU Drumulator* 1983) and Audio Workstations Digidesign (*Sound Designer* 1985).

1. INTRODUCTION

A speech-melody composition can be defined as a work generated 'by taking a fragment of recorded speech and approximating it with music notes' (Johnson 2012), rhythms and harmonies; or as Andrew Schnurr puts it, "the instrumental doubling of melodic and rhythmic inflection of the recorded voices in real time ... reinforcing speech on musical terms in real time concert performance." (Shnurr 2013) Over the past 36 years, composers such as Robert Erickson (1917-1997), Scott Johnson (1952), Steve Reich (1936-), Robert Davidson (1965-), Bernard-Francois Mâche (1935-) and Peter Ablinger (1959-) have been linking melody to speech, and notating it for performance on instruments. Though it could be said the genre has just grown out of its infancy, composers are continuously finding new ways to compose with speech, and the constant developments in technology and the different ways composers can manipulate speech recordings are continuing to aid composers in this endeavour to compose with speech.

Imitation of speech has been an important aspect of composition at least since the development of stile parlando at the beginning of the Baroque (Ellis 2017). Essayist Romain Rolland regarded Debussy's emulation of the "marvels of spoken French in music", in Pelléas et Mélisande as "the true model of the genre". (Néron 2012) Leos Janacek (1854-1928) based vocal melodies in his operas on the concept of *nápěvky mluvy*, (speech melodies) which he theorized were determinatively effected by the environment and therefore could implicitly communicate psychological conditions. (Christiansen 2004).

But it wasn't until the advent of recorded music, and later digital control of speech through the digital audio workstation and spectral analysis, that composers could fully realise the accuracy of exact pitch and rhythm. Snippets of speech make cameo appearances in several *musique concrete* pieces of the 1950s including Pierre Schaeffer and Pierre Henry's *Symphonie pour un homme seul* (1949-50) and Edgard Varése's *Poéme electronique* (1958). Even through the 60s with Reich's early phase compositions such as *It's Gonna Rain* (1965) and *Come Out* (1966), tape loops of recorded speech samples recorded on tape with analogue equipment. But these works by Reich were solely grounded in using speech with tape loops, with no instruments to generate musical material from. Although not using recorded speech loops, the score for Robert Erickson's *General Speech* (1969) for solo trombone, is a detailed transcription of a speech by Douglas MacArthur that uses the instrument in a manner McKay describes as instrument-as-speech-resonator (MacKay 1988): requiring the soloist to "perform the vowels and consonants" by "shaping the mouth, tongue, and throat in all different manners" while also performing the speech's pitch contour (Erickson 1969).

The first composition in the era of recorded music to derive melodic, harmonic and rhythmic content fully generated from speech material was Scott Johnson's *John Somebody* (1980-82). Johnson credits the works of Reich and Riley from the 60's for inspiring him to continue developing the link between speech and melody in composition. According the Oteri (2018) Reich's influence of Johns was reciprocated when Reich heard *John Somebody* in 1987, prompting him to resume

composing with speech in *Different Trains* (1988) and numerous works since that time.

This paper will specifically look into the technological transition of analogue tape and digital samplers, and how Scott Johnson and Steve Reich sit in between that transition with their works. Johnson's *John Somebody* and Reich's *Different Trains* will be analysed as to the composers processes in determining melodic, harmonic and rhythmic content from speech and the influence of shifting technological advances upon them.

2. EARLY TAPE WORKS OF STEVE REICH

From early in his compositional career, Reich was fascinated by the melodies of speech, and the stories that carried along with it. This interest in using speech as a basis for a musical composition began as the "indirect result of reading the poetry of Williams Carlos Williams in the 1950s." Reich tried to set his poetry to music only to find that he "only "froze" its flexible American speech derived rhythms." (Reich 2002) It was these early compositional experiments with speech using the tape technology available at the time that was critical to Reich's development as a composer, and through these investigations it led him to many of the compositional devices that characterised his musical style.

It wasn't until the early 60s that it occurred to Reich that using actual tape recordings of Americans speaking could serve as the basis for a musical piece. While working as a taxi driver in the early 60s, Reich used the job to explore this interest in recorded speech. It was around this time where he gathered a collection of spoken words and phrases, and the sounds of the streets around him by fixing a microphone inside his cab. He condensed about 10 hours' worth of the recorded tape material and compiled them into a three-minute composition entitled *Livelihood* (1964) (Reich later destroyed the master tape in the mid-1980s). It was these early experiments that grew an interest in speech and tape that has stayed with Reich throughout his compositional career.

In the fall of 1964, Reich recorded a black Pentecostal preacher in San Francisco's Union Square. The preacher, named Brother Walter speaking about Noah and the Flood, and it was this recorded material which formed the basis for a new piece *It's Gonna Rain* (1965). While experimenting, Reich made two tape loops using the phrase "it's gonna rain" and set the loops to play on separate tape machines. Over time, one of the tracks would gradually begin to get ahead of the other, thus getting out of synchronisation with the other. This process resulted in what Reich called "phasing". Although Terry Riley (whom Reich began a working friendship with at the time) was also working with speech and manipulating it in a similar fashion to Reich's phasing, Reich was the first composer who isolated the phasing process in his works consciously and continually used it through his compositions.

Through his phasing technique, Reich's attention was drawn to another aspect of what the tape loops where bringing to the forefront, that being the melodious characteristics of the recorded voice, which he later called the "speech-melody" (Ibid) of the phrase "it's gonna rain". Reich notes that by the repetition of the phrase and running it through the phasing technique, the process "intensified [the] meaning [of the word] and their melody at one and the same time". (Ibid) Thus, as the tape moves out of phrase with each other, various melodic, harmonic and rhythmic patterns would emerge.

This technique laid the foundation for his next work *Come Out* (1966), which uses the voice of Daniel Hamm discussing how he and his friends had been the victims of police brutality, and how in order to receive hospital care, their wounds needed to be visibly bleeding. The piece focuses on Hamm saying, "I had to, like, open the bruise up, and let some of the bruise blood *come out* to show them". (Ibid) [emphasis added]. Reich used this phrase as the main text for the work, using the phasing technique, as well as doubling the voices, creating four voices, which are later doubled again to create eight voices. From this process, a much richer variety of melodies, harmonies and rhythms are generated. The result is a piece in the same vein as *It's Gonna Rain* but with it's own distinct sound and intrinsic meaning.

Reich put an emphasis on the stories and the meaning behind the speech samples that he was using. He notes that "once the speech melody [had] caught my ear, the meaning of the words could never be overlooked. Even in my earliest tape speech piece, *It's Gonna Rain,* both the speech melody and the meaning of the words are inextricable bound together. How could it be otherwise?" (Ibid) It was this process, linking the meaning and the musicality of the speech sample he used which drew him to the 'documentary aspect' of his speech-melody compositions. This, opposed to Reich's early experiments with speech, the musical setting of text, in which the meaning of the text and the "singer's interpretation" of the text are separated. With the speech-melody works, Reich finds that the natural speech is most authentic, stating how "there is no singer's 'interpretation', but, rather, this: people bearing witness to their own lives". (Ibid)

Reich also came up with idea for a composition entitled Slow Motion Sound during this time. However, to this day is has "remained a concept on paper because it was technologically impossible to realise." (Reich 2002) The idea for the piece to "very gradually slow own a recorded sound [most likely speech] to many times its original length without changing its frequency or spectrum at all". (Reich2002) Experiments that Reich undertook with tape recorders, digital analysis and synthesis of speech and vocorders all failed to produce the gradual augmentation of speech samples that Reich was looking to achieve. However, while experimenting with a vocorder at the Massachusetts Institute of Technology, Reich was able to stretch a speech sample to approximately 10 times its original length, and from this

was clearly able to notate specific pitches for each syllable of the recorded phrase. This concept goes to show how far ahead of his time Reich was thinking. It was just one of the many limitations that the technologies available to him at the time presented; they prohibited him from executing the concepts he had in his head, and turning them into a reality. This problem didn't present itself to later speech-melody composers such as JacobTV and Robert Davidson, the later whom time stretched a one second speech recording 250 times in his piece We Apologise (2012). Though both these ideas being conceived some fifty years apart, it goes to show how far technologies have developed over this period of time to aid composers in achieving things that Reich could not.

Over the next 21 years, Reich would focus on this phasing technique with instruments, even having the 'Phase Shifting Pulse Gate' device created for him in the late 60s to work with. However, it was after a twenty-one year gap from his last recorded speech composition *My Name Is* in 1967, where after being influenced by Scott Johnson's *John Somebody* (1980-82) Reich composed what is widely recognised as the most significant musical compositions of the last 30 years, *Different Trains* (1988)

3. SCOTT JOHNSON

Scott Johnson (born 1952) is a pioneer in the use of speech in composition, and the relationship between classical tradition and the popular culture that surrounds it. (Johnson undated) His early works introduced the concept of instrumental writing based on speech samples. Johnson began working with speech in his compositions in the late 70s in the New York City downtown scene, where speech recordings (often manipulated and heavily edited) were very popular with visual and installation artists, musicians and poets. He had moved with the intention of giving up music to focus on being a visual artist, but being surrounded by such a strong art music culture, he says he couldn't "ignore the pitches". (Oteri 2018)

It was around this time that low cost, high quality tape recorders became common. Johnson traded his acoustic guitar for a "tape deck that combined both reel-to-reel and cassette mechanisms" (Johnson2017) with Alan Sondheim, who at some point later took Johnson to a jam with some art students who had a band by the name of Talking Heads. A block north of where William Burroughs was living at the time, Johnson began making tape loops of speech, crying and laughter with the machine he traded months prior. But in contrast to the speech works that came before him, Johnson use his speech sample as part of a musical score, adopting the practice of approximating the inherent pitches and rhythms in the form of music notation.

In an interview with Frank J. Oteri, Johnson claims that "although in some of those early *concéte* things the voices appeared within a pitched context, they didn't do the transcription thing, which is pretty music what I brought to it … He [Reich] didn't go to the idea of transcribing the pitches and turning it into instrumental music". (Oteri2018) This practice formed the foundation of the speech melody genre that we know today; the genre of approximating pitches of speech to instruments with musical notation. Johnson credits his experiences in the genre-blending of the late 70's art scene as the beginnings of what lead him down the path of transcribing speech into instrumental score.

While numerous composers including Robert Davidson (Head of Composition at the University of Queensland) and JacobTV (90's speech melody composer) cite Johnson as being the pioneer and innovative composer who "introduced the idea of instrumental melody, harmony and rhythm accompanying recorded speech melodies" (Davidson2000) and pairing it with live performance, Reich was key in bringing this medium into the public eye as well as into art music circles.

3.1. *John Somebody (1980-82)*

Johnson writes in his "Notes on Speech Music" article that he recorded the audio that opens *John Somebody* "sometime in 76' or 77' (Johnson2017). He asked one of his friends to "call anyone on the phone, and [record] just her side of the conversation" (Johnson2017). Once he returned home, he chose short fragments and "jotted down the pitches of the four phrases that would eventually be used for John Somebody, along with the four moving chords and the ostinato that the suggested." (Johnson2017)

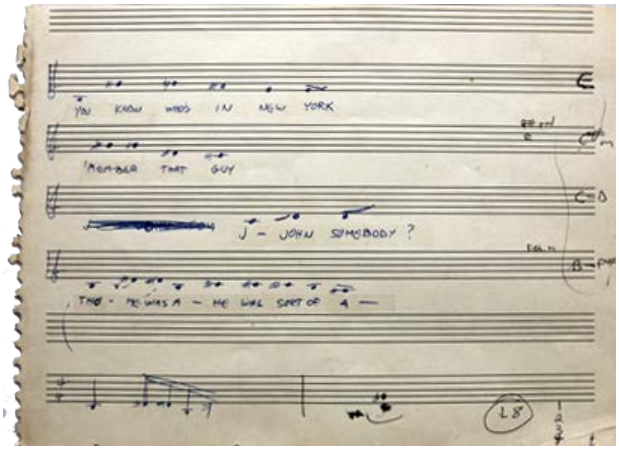

Figure 1. The original notated sheet music containing Johnson's musical transcriptions of the four phrases of spoken conversation that became the foundation for *John Somebody*

> I went home, had a listen, and the pitches were so clear. I picked up a guitar and played it, there was this implied 5th of a triad, then the major 3rd, and then a chromatic crawl down to the root. And the pitches of the succeeding phrases suggested some big rock and roll power chords. From an E down to a C# minor, and then a C and a D and back to E
>
> (Ricks2014)

Johnson would sit on these recorded and transcribed fragments for a few years before returning to them in 1979. In the meantime he dabbled in other speech pieces, a piece called Readout, an improvisational piece where musicians reacted to speech phrases in their headphones, and Home and Variations, a looping speech piece for a choreographer. The technique used in Home and Variations, where Johnson followed "a mixing "score" that indicated the ons and offs, and fades in and out, for each channel" (Johnson2017) was the foundation for how the underlying tracks of John Somebody was later made.

Finally, once Johnson did return to the fragments recorded years earlier and began serious work on *John Somebody*. He recalls one afternoon, thinking of "three influences … into the idea of transcribing speech." (Johnson2017) The first; the call and response of American blues. The second; Messiaen's "careful transcription of bird songs" (Johnson2017). And finally, from a technological and repetitive texture, Reich's tape works from the 60's. This final influence is crucial in the speech-melody genre's foundations and later developments, as Johnson was not only influenced by Reich's early works of the 60's, but with *John Somebody*, Johnson was able to re-influence Reich into composing with speech only a few years later. "Steve [Reich] … was an influence on me, and I was proud to have re-influenced him." (Oteri2018)

The overall work for *John Somebody* is comprised of 9 compositions, mostly lasting around 3 minutes in length. The recorded fragments from 76' would form the phrases heard at the beginning of Part I, of which an early version was performed in 1979. Part II was contrived from Johnson's own phone conversation, editing out every use of the word "think". The Involuntary Songs 1-3 all came from a tape recording of a girlfriend laughing.

This is how Johnson describes the process for composing the piece.

> The original phrases were looped and layered in synchronisation on a multi-track tape machine. Then that polyphonic tape was itself looped, and the results carved into with a mixing board, which allowed me [to] highlight any segment of any phrase, or combine it with others, all in pre-arranged rhythmic synchronisation. (Johnson undated) (Johnson2008)

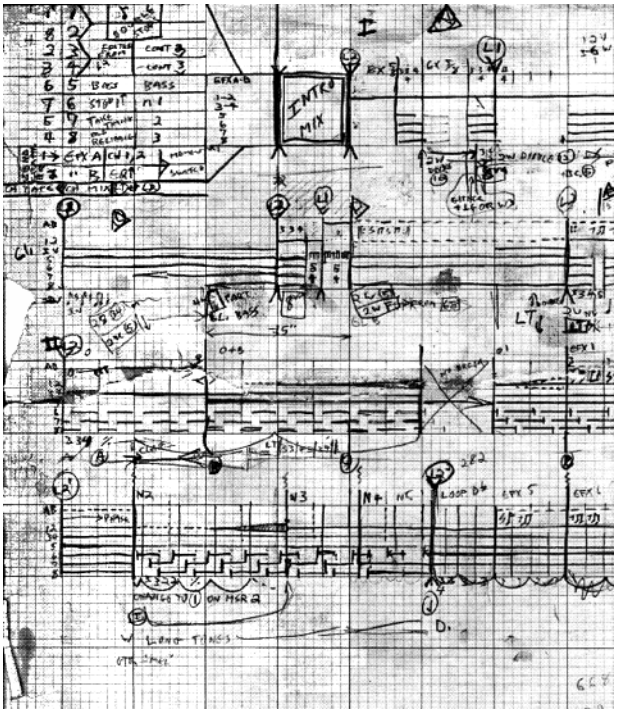

Figure 2. Johnson's graphic score for operating the mixing board for *Involuntary Song 3* in *John Somebody*

It was this technique that Johnson used for the *Involuntary Songs*. The twelve-bar melody of *Involuntary Song 3* required a 25 foot tape loop (just one quarter note was 2 5/8 inches in length). Johnson found it hard to get the tape loops in sync with each other (this in comparison to Reich who experimented with the loops becoming in 'phase' with each other). It took him an entire month to get it right. Within this piece, there are five pitches of 'hahs' (laughs), which Johnson used to create chords. Any two of these 'hahs' would create the implications of either a minor or major chord. As a result, he would have to synchronise those multiple loops with the much larger 25-foot tape loop. Once synchronised, Johnson would create these 'chorus' by turning individual laughs on and off using his mixing board as the chords went by.

> I recorded the underlying instrumental parts of the first two sections myself on an 8-channel machine, treating them to the same layering, editing, and mixing as the voices, and keeping everything but the solo part nearly as simple as the voices themselves. Individual channels were often combined into stereo submixes [mixing a collection of channels down to one], freeing up more channels for further layering. In the first two sections, my structural decisions were represented in graphic mixing scores that I followed as I manually moved volume faders and channel on/off buttons. Only in the Involuntary Songs, where wind instruments and classical guitar techniques enter, did I begin to make traditional scores.
>
> (Johnson2008) (Johnson undated)

One thing that Johnson did with *John Somebody* which overflowed into his speech-melody compositions of the 2000s is that he transcribes all the speech samples by hand:

> …this way [notating by hand] I can erase things, and the other thing is the pitches aren't always exact, so I can make little gliss lines, or I can make stems that indicate the syllables, and then a line that indicates that it's moving up like this. I can write little parenthetic things up top. Little arrows up and down for when it's a quarter tone. Mostly I don't fix pitches. But if it's a quarter tone, then I will maybe resolve it if it's a held pitch. (Oteri 2018)

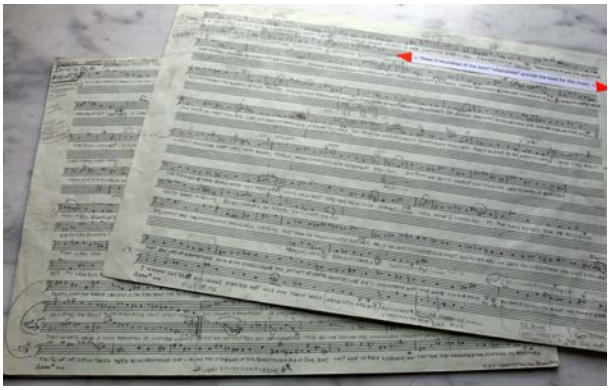

Figure 3. Several of the hand transcribed manuscript papers for Johnson's 2009 composition *Mind Out of Matter*

While *John Somebody* doesn't deal with the number of speech samples that *Mind Out of Matter* does (four samples compared to over 100), the transcription process used in both the pieces is one in the same. Nonetheless, Johnson finds that there is no point in keeping the microtones in as he is writing for tempered instruments, as he doesn't want the instrument and the voice to be out of tune with each other.

Upon reflection over the past thirty or so years, Johnson has developed his speech-melody practice into a refined compositional practice. Though there are things that he could go back and tidy up in *John Somebody*, he would rather put his focus into composing new speech influenced works. But what can't be ignored is the legacy that he has left behind with this ground-breaking and genre-defining composition. The "rigorous compositional techniques" (Oteri2018) he employed laid the foundation not only his own future compositions in the speech-melody style, but also set up the genre for new composers to take these compositional techniques, and develop the style with the technological advances to come in the coming decades.

4. *DIFFERENT TRAINS (1988)*

The dawn of the digital music era in composition can be marked with Steve Reich's composition *Different Trains*. Evolutions in the technology available at the time made this piece possible, as the development of the digital sampler in the 1980s enabled musicians, producers and composers a greater ability in working with audio recordings musically. Andrew Alan Schnurr writes that "compared to tape, which required physical splicing for audio edits, digital samplers were more adept, opening up doors to greater sophistication and precision of expression while working with audio in the digital realm." (Scnurr 2013)

Reich was re-influenced into composing with speech upon hearing Johnson's *John Somebody* in 1987. With the introduction of the digital sampler into the market, it opened up new creative avenues for Reich to work with recorded speech samples, enabling him to take what Johnson had begun to another level. John Michael Pymm writes in his paper that "*Different Trains* became possible as a result of the invention of the sampling keyboard in the mid-1980s … sampling technology enabled a new level of manipulation of the human voice." (Pymm 2013) This technology would become essential to Reich's creative process for *Different Trains*.

It's important to note, that while Johnson innovated what we now know as the speech-melody style, by giving a speech sample a set of pitches, rhythms and harmonies and pairing it with live instrument performance, Reich was key in bringing the style to the forefront of the public eye and into art music, so much so, that Reich won the Grammy Award for Best Classical Contemporary Composition in 1989 for the work.

The introduction of the sampler into the market became the bridge between Reich's early works in the 60s, and enabled to bring what he was doing some twenty years prior "up to the late 80s". It made it possible to "merge the documentary reality and the musical reality into one indissoluble thing." (Unattributed 2007)

This was key to Reich and his works, give his focus on the documentary nature of the speech samples he used in his piece. He desired to tell stories of real people, and the effects the world had on them. It was through these stories that he found meaning to what people where saying, and through what they were saying, he found the melodies and rhythms. He was able to more accurately and effectively translate the meaning of the speech (the documentary reality) to the musical reality, and merge the two into one.

Different Trains is a twenty-seven minute, three-movement composition commissioned for the Kronos Quartet, utilising recorded speech samples, taped recordings of American and European trains, and string quartet loops as well as live performance. Looking back on his early life, and the numerous train trips he took as a child at the beginning World War 2, Reich, desired to write a piece presenting a documentary and musical reality of train rides in America and Europe during the War. Being of Jewish heritage himself, Reich would have been riding on very different trains had he grown up in Europe. Thus, the concept for *Different Trains* was born.

Taken from the sleeve notes of the Kronos Quartet recording, Reich notes that "in order to prepare the tape I did the following:

1. Record my governess Virginia now in her seventies, reminiscing about our train trips together.
2. Record a retired Pullman porter, Lawrence Davis, now in his eighties, who used to ride lines between New York and Los Angeles, reminiscing about his life.
3. Collect recordings of Holocaust survivors Rachella, Paul and Rachel – all about my age and now living in America – speaking about their experiences.
4. Collect recorded American and European train sounds of the 1930s and '40s.'

(Reich 1988)

Reich combined the speech samples with the string quartet by selecting small speech samples that were "more or less clearly pitched and then notated them as accurately as possible in musical notation." For example:

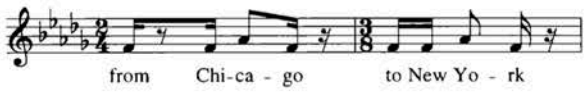

Figure 4. Sample transcription of *Different Train* from the sleeve notes

The strings would then literally imitate that speech melody. Reich remarked, "As they spoke, so I wrote; they gave me the notes, they gave me timbre, they gave me tempo, and they gave me meaning." (Reich2002).

Rachel E. Weiss' paper on the use of human speech in Reich's music looks at *Different Trains* in depth and how the piece was put together with various techniques. These speech selections and a variety of trains sounds were recorded, edited, and transposed using the Casio FZ-1 and FZ10M samplers." (Weiss 2011) Reich then composed multiple four-part scores, three of which were to be recorded, with the final one for live performance. The recorded tape combining the three recorded string quartet parts, as well as the speech and train sounds served as the accompaniment to the live performance which the Kronos String Quartet played the fourth score. The primary function of this fourth score is to highlight the speech-melodies by either anticipating them, doubling them or following them. At times, the quartet would pre-empt an upcoming speech fragment, foreshadowing it's musical character. At other times, the quartet would play along with the speech fragments, bringing out the colour and melodic contour of the speech samples. Occasionally, the instrumental speech-melodies would occur after the speech samples, echoing and amplifying their tonalities.

Weiss goes on to analyse the three movements of *Different Trains* noting that movement one contains several shifts in tempo and timbre to reflect the specific melody and rhythm of each recorded spoken phrase; the tempo speeds up and slows down, the instruments move high and lower to prepare for new melodies. This is in stark contrast to the second movement in which many of the spoken phrases are not manipulated. The third movement then comes back to what movement one was doing, with changes in melody, tempo and timbre to reflect the new speech-melody recordings.

With the introduction of the digital sampler into the market, it allowed for a much more detailed and in depth control of the speech samples. A key example of this is the continual change in tempos. Though the digital sampler gave Reich the ability to manipulate speech, he chose to remain faithful to the original recorded samples, opting to frequently change the time and key signatures with the introduction of new samples in different sections. It would be more difficult to change tempos while composing working with tape, given splices in the tape would have to be extremely accurate to get a change correct. Alan Schnurr write that "due to greater control with samplers in placement and layering of recordings, it was possible to organize voice recordings in rhythmic and melodic frameworks more deliberately than in Reich's earlier recorded speech compositions." (Schnurr2013) This also took what Scott Johnson was doing *John Somebody* (which was completely composed using tape) to another level, opening up doors for greater manipulation with not only tempo, but also melody, harmony and rhythm. Everything that Reich accomplished with *Different Trains* would not have been possible some ten years prior without digital sampling technology.

Different Trains sat in the transitional period between the analogue and digital domain, and in the sleeve notes, Reich remarks that the work "begins a new musical direction". Numerous academics write different things about what this new direction is, but given what *Different Trains* achieved with the infancy of a new technology, it's safe to say that it is the piece that took speech-melody composition out of the analogue world, and began opening doors to new possibilities for composition in the digital world.

5. LIMITATIONS ON TAPE & SAMPLERS

Though tape was the pioneering technology used for composing with speech samples, it had many limitations that have been voiced by the early speech composers over the years. Not only was tape very costly (particularly early on through the 50s and 60s), but it was also extremely time consuming and labour intensive. Many composers relied in public funds and specialised workspaces to create their works. Zachary Pischonotte writes that working with tape was "very much a physical process that involved cutting the magnetic tape with a razor blades and splicing it into place. The same results can now be achieved on a composer's personal computer using audio editing software." (Pischnotte 2016)

Johnson describes the composing process of *Involuntary Song 3* from *John Somebody* was "absolutely insane" and "very labor intensive" (Johnson 2008). Post *John Somebody*, he didn't return to speech music for several years, citing that though "digital samplers were gradually improving, [and] after all the technical drudgery of tape work, [he] wanted to wait until there was a computer-based score program that would trigger playback directly from a sampler." (Johnson 2017) This would enable Johnson to work within a score, rather than "translating between score, sequencer and sampler." (Johnson2017) This finally happened in the early 90s with the introduction of the DAW (Digital Audio Workstation) and notation softwares into the market. Because of introduction of the DAW, Johnson could do "in two days with Pro Tools [a DAW]" what took him months to accomplish with tape. "But that [tape] was the technology of the times, and it was brand new – multi-track tapes at home." (Oteri 2018)

Johnson returned to composing with speech sample in the early 90s, having not worked with speech since *John Somebody*. He composed *Convertible Debts* (1994-96) for his own ensemble, and *How It Happens* (1991-93) for the Kronos Quartet. The big difference between these works and *John Somebody* is that Johnson is free to use much larger samples of speech, longer phrases and sentences. Tape loops required much repetition, and as a result, a fairly small selection of words (four phrases for *John Somebody*). This compared to the world of digital samplers, individual speech samples could assigned to any individual key on a virtual or physical keyboard, or programmed and synchronised in seconds using ProTools. Though Johnson could still resort to using short phrases with repetition, he's no longer confined to this, given the advances that technology has given him.

Not only this, but Johnson can work with 100 plus phrases, analyse all the pitches and rhythm (using the software itself, not his ear), then easily create polyphony with them, synchronise them rhythmically, and even tune individual syllables or entire phrases if he wanted to (a technique he says he'll never use as he wants to keep the speech as natural as possible).

With the developments in technology however, comes more complex compositions and interplay between speech and the instrumental parts. Performers now have to work with click tracks to keep in time with the samples, because if the tempo or samples are slightly off time, then the entire performance falls apart.

6. LATER INFLUENCES

Reich's early speech works of the 60s, and his focus on the repetition of vocals phrases became a major influence in the speech-melody works of Jacob ter Veldhuis (JacobTV) in the late 90s and early 2000s, including his works (1999) and *Pimpin'* (2007). Johnson is also credited as an influence to ter Veldhuis; the two have become close friends because of their common interest in speech-melodies. The Head of Composition at the University of Queensland, Robert Davidson also cites Johnson as the pioneer of the speech-melody style, being influenced by into composing *McLibel* (2000), and later *Not Now, Not Ever* (2014).

Not only did Reich and Johnson influence later composers, but later technological advances, and the affordability of new technologies in the mid-1990s, the compositional practice of the speech-melody genre became more popular and accessible to new composers.

7. CONCLUSION

Speech-melody composition is now one of the most influential genres of composition of the past 40 years. Though having its influential roots through the 60s, Johnson gave the style its footing in the early 80s, and Reich later cementing it in the minds of composers in decades to come. But the style wouldn't be where it is today without the technological hindrances and developments that surrounded its foundation in the 1980s.

That being said, we could still ask these questions. If Johnson had never traded in his acoustic guitar for that tape deck he later composed *John Somebody* with, would the speech-melody style we know today be around? Would Reich have been re-influenced into composing with speech again without hearing Johnson's pioneering work? If Janacek had a tape recorder in the early 20th Century, would he have used speech samples in his compositions? Who knows. But regardless of the technique that composers used, be it straight transcription, tape, digital samplers, or later with the DAW or spectral analysis, there has, and always will be a link between speech and music. It's just up to the composer and how they use the technologies available to them at the time to inform their compositional practice in composing with speech.

At the end of the day, Scott Johnson put it best. "As you can see, these different groups of pieces were, and still are, driven in part by the technologies that make them possible - just as the orchestra can be seen as a collection of advances in instrument design and construction. The tool shapes the hand that uses it." (Johnson 2017)

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