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Portfolio

In my portfolio I hope to demonstrate why I choose my research area, how I researched my information and what I learnt, both about the chosen subject and literature review methodology.

Rational for my Study

I have chosen to research into the use of CCM vocal onsets and offsets. This area of study will directly impact my knowledge as a teacher and ability to help my students achieve their goals within CCM singing styles.

I have split onsets and offsets into 'traditional' and 'modern', as when pedagogies talk of onsets and offsets, they will usually be referring to the 'traditional' glottal, aspirate and simultaneous and it is commonly thought that only a simultaneous onset and offset are appropriate in vocal use. In CCM styles we use these three options in a less discriminatory way as expressed by Winnie, "three forms of onsets: aspirate, balanced, and glottal; all onsets are used depending on the genre being performed" (2017, 62). Simultaneous is still considered the primary foundation of onsets and offsets and should be achievable by the vocalist however, the other two are commonly used by CCM singers for emotive effect and therefore we need to have an understanding of when, how often and with how much vigor to use these.

The classical approach is taught with the foundation and emphasis being on good technique with emotion coming as a secondary factor whereas within CCM styles historically speaking emotive intent seems the more prominent feature with the technique and tuition of CCM singing coming later. Hakanpaa notes that "There are statistically significant differences in the recognition of emotions between classical and CCM styles of singing" (2019, 1). This may be because of the development of each style.

As well as these 'traditional' onsets and offsets we have more modern ones; distorted, slide, creak, and cry, which are only used in some traditional world music and CCM styles. "compared to the Western classical style, the CCM style offers more freedom for expression by using changes in voice quality" (Hakanpaa, 2019, 10). I want to delve deeper into my understanding of these 'modern' onsets and offsets and find out how they are achieved physiologically.

During my research into onsets and offsets I will explore how vocal registers and CCM tones are related to the onsets and offsets and question whether the same vocal technique can be used for multiple facets. Is a creak onset and a fry register achieved with a similar or even the same use of the voice? Breathy tone and aspirate onset are surely related and similarly achieved? Asking these questions, I hope to not only have a better understanding of the voice use in CCM styles but also be able to help my students achieve these vocal facets with more ease and comfort.

Because of its relative newness, CCM singing styles haven't been researched as in depth as Classical styles. Therefore, it is important for me to use up to date research and literature for this essay but also to keep informed as it is developed in order to learn more about the CCM singing voice for my practice in the future. "singing teachers should be trained to utilize a multifaceted approach to developing vocal technique, given that recent singing pedagogy literature implies that there is a significant lack of training in the areas of CCM" (Winnie, 2017, 55).

It is essential for CCM coaches to have a broad understanding of all vocal facets used in CCM styles in order to best serve their students and the repertoire the student is learning and performing. If I want to best serve the singer in front of me, I need to be able to identify the styles of CCM they are interested in and if the facets they are currently using best convey their intent. If a student comes to me and tells me they want to sound more like a rock vocalist I should be able to identify what is missing from their vocal technique that would give them this sound and help them employ said facet(s) into their repertoire. Winnie states that "Contemporary commercial music (CCM) requires a different vocal approach than the standard Western classical tradition, yet most singing teachers are not being trained in vocal technique associated with CCM in traditional university music departments" (2017, 55). This research should help me as a practitioner to have a more in depth understanding and therefore an ability to better teach onsets and offsets in varying CCM genres.

Currently I teach mostly beginner teen and preteen singers in a school setting which leads to having students starting and stopping lessons termly as well as sometimes being in group lessons. In these situations, the main focus for me as a practitioner is on a healthy and sustainable technique and keeping students engaged during lessons. This means I am frequently teaching beginners and don't often get past the initial stage of alignment, airflow, and support technique. As much as this teaching style is helping me learn the basics of my craft, I would like to grow and develop my knowledge for the professional students I currently teach and those I teach in the future as my student base expands.

Looking into CCM onsets and offsets, including, where appropriate, tone and register will help me as a coach with my current students to build upon the foundations of good technique should they be ready for stylistic choices. "With more knowledge of the vocal mechanism, educators can learn numerous ways of producing their desired quality" (Winnie, 2017, 65). It will also hold specific relevance to my development as a practitioner with professional singing students arming me with knowledge and confidence for professional performing students who frequently already have the foundations of a good technique in place.

Program of Study

“Literature reviews play an important role as a foundation for all types of research” and “if well conducted, have the capacity to engender new ideas and directions for a particular field” (Snyder, 2019, 339).

There has not been a great deal of research into CCM styles however in the last few years it has become more prominently researched. This lack of previous research may be for a number of reasons, the existence of the Pop singing style happened around the 1950's whereas classical singing has been in existence for hundreds of years, CCM styles are not as well respected in many areas of the pedagogical world, which ties in with the last reason, that CCM singing can be considered detrimental to a singers vocal health. Borsch has discussed this issue and believes that CCM styles “merit attention, particularly as the voice use in many of the non-classical styles is sometimes considered detrimental to vocal health” (2004, 147). However, Caffier's more up to date research helped to stand against the ideology that CCM facets are harmful by suggesting that “The vocal apparatus of all singers was healthy and capable of high performance” when they performed “breathy voice, creaky voice, vocal fry, grunting, distortion, rattle, belt, and twang” (2018, 1). Caffier also states that these ‘nonclassical vocal effects, are of great importance to keep a healthy voice’. He believes that “experienced singing teachers” need to be passing on “knowledge and training” to avoid the “risk of damaging important laryngeal structures, which can manifest itself in acute injuries” (2017, pg.6).

I hoped that by conducting this research I would learn more about my practice as a CCM teacher and expected that I could find correlations between different facet functions. I also wanted to demonstrate that CCM singing is a vocally healthy option if done with good technique “vocal qualities can be created that are sustainable and healthy for all singers” (Winnie, 2017, 55). Thurman states that “Lifetime vocal health is possible” if three things are in place; “fundamental vocal skills have been learned with optimum efficiency” with special attention to the transition from M1 to M2, “the laryngeal muscles, connective tissues, and vocal fold cover tissues are well conditioned” in other words the student has been practicing their craft regularly, and “singers know how to protect their voices”, this includes staying hydrated and allowing time for rest (2004, 46). This would suggest that CCM facets would not have an impact on vocal health in trained singers. Caffier believes that “if these effects are used only briefly, controlled, rather carefully, and as a specific mean of expression, voice damage is not to be feared” (2017, pg.6).

It is considered helpful for researchers to have “some conceptual and methodological guidance” when writing a literature review paper (Van Wee et al, 2016, 1). And so, I need to have an understanding of the methodology involved in conducting the research. Snyder states that there are three approaches to conducting a literature review “systematic, semi-systematic and integrative” and that dependent on the “purpose and the quality of execution” each of these approaches “can be very effective” (2019, 333-4).

The systematic review requires identifying “empirical evidence that fits the pre-specified inclusion criteria to answer a particular research question or hypothesis” (Snyder, 2019, 334). Meaning that

research and articles used must be searched for with a specific question or topic in mind, be primary source material, and well documented. This should stop the occurrence of writer bias in the research results. This methodology suits my research style well as I have a strong idea of what I want to research however the lack of specific research in the topic may make it difficult to exclude researcher bias as I will frequently be using articles within the subject area that are not specific to my topic and are more general causing me to make assumptions and fill in the gaps with opinion from experience.

The next methodology is the semi systematic review which requires research to have been done by many researchers of different backgrounds. Allowing the researcher to create things like a “historical overview or timeline of a specific topic” looking at the preexisting research and adding new knowledge with “an agenda for further research” (Snyder, 2019, 335). This methodology doesn’t suit my research as there is none into my specific topic, only on the topic areas surrounding it.

Lastly is the integrative methodology which, according to Snyder, is designed to “address mature topics or new, emerging topics” (2019, 335). I feel this style of review to fit best with my research as my subject area is mostly unresearched and therefore a relatively new topic to be explored. This style would require me “to critically analyze and examine the literature and the main ideas and relationships of an issue” (2019, 336). Once I have examined the literature I can then “generate a new conceptual framework or theory” based upon what I have found from the relating subject matter (2019, 336). When using integrative methodology, I should be careful to show clearly how it “was done and how articles were selected” (2019, 336).

My original topic was to focus on all CCM facets and with this in mind, I began my research by first using the student resource system, I explored the categories; extreme voice, anatomy of the larynx and voice source, belting and twang, registers and voice clarification, and vibrato. When reading Aaen’s most recent journal of voice research, in the extreme voice folder, the CVT work of Sadolin was mentioned as the catalyst for the research. ‘Complete Vocal Technique (CVT) is a method of singing teaching that has achieved international widespread recognition, and it has, since its introduction in 1991 by Cathrine Sadolin’ (Aaen, 2020, pg. 162). This led me to look into the CVT research site. I spoke to some of my peers about their experience with CVT and found that they had found it to be a useful resource. “CVT has been used for identifying, defining, and teaching vocal effects for many years by voice professionals from all over the world” (Thuesen, 2020, pg. 170).

In order to have a fuller understanding of the facets used in CCM styles I felt it would be useful for me to listen and watch a wide range of CCM music so I can hear and see exactly what facets my students will want and need to learn. I used my own knowledge of CCM repertoire and YouTube to find audio examples for my Listening Appendix.

Doing the above research gave me the opportunity to fine tune the direction and, after a discussion with my tutor, acquire more information on how to research. During the first meeting with my tutor

reviewing my subject and study on my essay topic and research style we discussed how to narrow down my literature review from all the CCM facets to only the onsets and offsets used in CCM styles but still touching on other facets where appropriate. We also discussed a need for a more varied and thorough use of research materials using the Mendeley and Sci-Hub software. This opened up my research and gave me the opportunity to find much more relevant and up to date articles. Once I had explored this more, I emailed my tutor who explained I needed to include why my research is relevant to my practice in each facet of my research. This meant I really started to use the integrative methodology as I touched on the emerging need for research in this field for the practice of CCM teachers. As my idea adapted and changed, I began to think that my aim could be to learn the appropriate time and place for each onset and offset, the physiological mechanisms that create them, and whether there is a crossover of physiology with onsets, registers and tone. If there is a crossover, could this be used to improve the efficiency of the learning? "Often snowballing is used" when conducting a literature review "and this should be made explicit" (Van Wee et al, 2016, 7).

This now meant I needed to narrow my research to current literature on onsets, offsets and other factors involved in the 'modern' onsets, such as registers and tone. Also looking into CCM genres and which onsets and offsets are most appropriate using literature, and video and audio of Popular artists across a range of styles using my current knowledge and knowledge of my peers. "With the wide variety of vocal qualities across genres it is important to listen to exemplary vocal models in each style to make authentic choices" (Winnie, 2017, 68).

It was important that when conducting my research, I thought about how I would collect information. Previously I had used the folders in the MA student system but now I was using Mendeley I started by searching relevant words and phrases such as; vocal fold onset, glottal adduction, distortion, simultaneous onset, glottal attack and vocal registers.

When using Mendeley to search these keywords many articles that I did not feel were relevant to my subject area appeared and so I had to conduct "the process of including and excluding specific articles" (Snyder, 2019, 337). If there were articles on speech onsets, rather than singing onsets, I had to carefully consider how much weight this would hold for my research which was based on the singing onset. While some of these articles were interesting to me as a researcher of the topic, I could only use the data from them in select cases. "proper steps need to be followed and action taken to ensure the review is accurate, precise, and trustworthy" (Snyder, 2019, 334).

Once I found an article that I thought would be useful I could start by "reading abstracts" to see its relevance to my topic "and then reading full-text articles later", this seemed a more efficient way of researching rather than to "read each piece of literature that appears in the search in full; this is a highly useful, but time-consuming approach". (Snyder, 2019, 337).

While looking up my research area of onsets and offsets in CCM singing, I couldn't find any research that matched closely with what I wanted to study for the 'modern' onsets. However, the most similar research areas and therefore, some of the articles I ended up using for research purposes were;

- Thuesen et al 2020 research into Rough Vocal Effects in Singing, which included distortion.
- Chappell et al 2018 research into vocal fry, which is useful when looking at a creak onset

This previous literature does cover some modern facets such as distortion and creak tone but it covers very little (only the Chappell research on fry) on these modern facets being used as onsets and offsets which leads me to believe that this area of research is an important new area of study for CCM teachers. "Students should not be expected to learn these styles authentically and healthfully without guidance from music educators and vocal teachers" (Winnie, 2017, 57). Without research into these areas, teachers are reliant on theories rather than facts to teach their students.

When looking at the more 'traditional' onsets and offsets there was much more research but mostly linked with classical rather than CCM singing. Articles that I found similar to my research topic included;

- Lebacqz and DeJonckere 2019 research, The dynamics of vocal onset. This was very useful in research of the glottal onset.
- Herbst et al 2015 research into Glottal Adduction and Subglottal Pressure in Singing was particularly interesting when looking into the aspirate onset.

The above research focused mainly on the article topics however, something else that I felt was important when choosing which research to include was the year that it was conducted and published. In my research I have mostly used articles from the last five years with only a handful of older articles and very little that predate 2000. The authority of the authors in the older articles and the history of the subject is what led me to keep these in my research paper. Using these older references meant I was building my "research on and relating it to existing knowledge" which "is the building block of all academic research activities" (Snyder, 2019, 333).

When it came to the writing of the review, I decided to split the research into sections. The two main sections were the 'traditional' and 'modern' onsets and offsets but each of these then had their own subsections. Within the traditional there is glottal, simultaneous and aspirate and within the modern I put distortion, slide, creak and cry. Within the aspirate section I also touched on the topic of breathy tone, with slide I had to mainly focus on register as there was no research on the slides individually, and with creak I mention the M0 or fry register as being relevant. Outside of these sections I created a Listening and a Learning Appendix which showed how the research directly correlates with CCM singing styles. This meant my research could be "used for teaching, as well as research purposes" (Van Wee et al, 2016, 3).

Reflection of study

When reflecting on my literature review, I feel I have researched and learnt from articles found through the MA student folders, Mendeley and Sci-Hub websites, I also used my own experience to research audio, and my past experience as a practitioner for reference. When looking into the traditional section of my review I looked for articles containing words such as; glottal, adduction, attack, onset, and closed quotient. This was a reasonably successful investigation despite there not being any studies that directly attached to CCM onsets and offsets.

When searching for the modern onsets and offsets I had to widen my search to topics like distortion, extreme voice, ventricular folds, vocal fry, registers, and contemporary singing. I had to use a broader search here as there was no success in searching for CCM onsets as no research has been done into this as perhaps it could be argued they don't exist and are merely facets used in conjunction with a traditional onset. However, creak onset and offset did have some research into them, indicating that perhaps CCM onsets need closer inspection and experiments conducted on their behalf. It was not possible for me to find any research into slide onsets and I had to rely on my knowledge of repertoire and the research into registers to show some kind of evidence of technique.

I think my findings show that "While there has been much scientific research on the operatic (Western classical) singing style, non-operatic styles rarely have been analyzed" (Tsai, 2010, 210). Luckily registers are a hotly debated topic in classical singing and so this gave me some articles to use in my review. When starting out with my research I hadn't yet honed my essay title and so I ended up spending some time looking into belt, twang, growl and whistle tone. While these weren't included in my essay, I found the reading to be very interesting as topics that I could explore for different literature review papers and also useful for my practice as a performer and teacher. This wasn't the only positive I took from my research experience. The learning of the CVT website, Mendeley, and Sci-hub, mean that I now have more resources for learning and developing my practice.

I found that the traditional onsets and offsets had more literature available and I have more practical experience with them, making them a relatively accessible topic for me to research. Despite this I still had plenty to learn but the accessibility and previous knowledge made the learning experience more enjoyable. The modern onsets and offsets were more of a challenge for me as I have less practical experience using them and there is also far less literature on CCM vocal facets. This made it tricky to figure out how to research and write about them, causing me to think of new ways to incorporate them, such as the use of register research in slides and M0 in creak. The lack of resources in CCM could be because this field of study isn't often researched due to classical singing having been prevalent for hundreds of years longer than CCM styles and so the research hasn't yet caught up to the new styles of vocal use. These 'modern' onsets and offsets could be derived from the general consensus within CCM styles to push the boundaries of 'normal' music making. Examples of this can be heard clearly in the electric guitar playing of Jimi Hendrix and the piano playing of Jerry Lee Lewis, perhaps expressing emotion through aggression, angst, sorrow by using vocal sounds that are harsh and unclean has become more accepted and celebrated in recent years. Or, perhaps there is little

research on the 'modern' onsets because they are in fact one of the 'traditional' onsets coupled or covered with one of the 'modern' onsets.

Terminology is problematic in the CCM pedagogy world as the terms I have used to describe the facets in my research can be described with other names. Chandler touches on this topic in her article for the voice council stating that "It can be quite a confusing world for singers and singing teachers alike to communicate with each other" (2013, 1). Terminology is conflicting and confusing for those who study the subject of voice pedagogy. I tried my best to overcome this by sticking to one term for each facet as much as possible and sometimes adding a different name for recognition by the reader where appropriate. In particular Register terminology can be a little confusing as "concepts and practices related to vocal register phenomena, including their linguistic labels, have been somewhat varied and commonly contradictory" (Thurman, 2004, 2). For the purposes of my research write up I have used the following four terms, fry (M0), Chest (M1), Head (M2), and Whistle (M3). I have used these because "Research has revealed that the vocal cords are capable of producing at least four distinct vibratory forms, although all persons cannot produce all of them" (McKinney, 1982, 94). While some believe there to be more than four, I thought it most compact to stick with the four most commonly known ones.

Due to the nature of the voice being so holistic, structuring the essay and creating the flow of the topics proved challenging as many of the facets are intertwined and require a similar vocal physiology which meant one topic couldn't always flow on to the next most similar but the reader had to be referred back or forward to a subheading. I tried to overcome this by narrowing down my research and touching on topics as they arose.

In my next literature review I will do more planning and a more structured timetable of learning and executing my plan by doing a breakdown week by week of what I hope to achieve, whether that be reading, listening, teaching or writing. I also want to spend more time reading and researching before deciding on my topic title so that I have a clearer direction earlier on in the process of my review. In reflection this research has created a change in my behaviors as a teacher, reiterating the importance of focus on onsets and offsets both traditional and modern, and expanding my understanding of what they are and how and when to use them. This research has been a great way for me to spot the weak spots in my own practice and none clearer than the practicality of the distorted voice (see Learning Appendix). This blind spot in my own practice, highlighted by the research gives me plenty to work on as a singer and practitioner, which should make me a more capable, well rounded coach.

A literature review into onsets and offsets that are used in CCM singing, touching on how they are holistically linked with other CCM facets

Introduction

“Singers need to express emotions vocally with great passion, but with sufficient control that the audience can identify with the portrayal of emotion and at the same time enjoy the brilliance of the musical sound” (Hakanpaa et al, 2019, 1).

As a CCM singing teacher I would like an understanding of the onsets and offsets used in CCM styles so that I can incorporate them in to my own teaching practices allowing my students to received informed and well researched methodologies. I feel this information and knowledge is imperative to help my students practice and perform to the best of their ability with the most authentic sound, thus producing the best results with ease. Winnie believes that “Just as with a synthesizer, every sound has an envelope which at the most simplistic includes an attack, sustain, and decay” (2017, 61). In my research I will be focusing on the attack and decay of the sung sound, looking at traditional (glottal, aspirate and simultaneous) and modern/CCM (distorted, cry, slide & creak) onsets and offsets, and how these are achieved. Because of the nature of singing, some of these onsets and offsets will overlap in technique and function with other CCM facets and I hope to demonstrate this through my research within this essay.

Dromey notes that “On the surface it may seem simple to define a specific set of acoustic and physical measures that characterize a pleasing voice” while this stands to be true on a basic level, I hope to delve deeper with my research into the overlapping technique of CCM singing as “many factors are involved in beautiful singing” (2014, 170).

Onsets & Offsets

“There are an unlimited number of sound variations that can be achieved with changes in breath pressure, airflow, and onset” (Winnie, 2014, 37).

Onsets are how a pitch (and often a lyric) is approached or attacked by the singer. The methods we use to approach a note can also be used in reverse when exiting a phrase or pitch, otherwise known as the offset. “To some extent, the voice onset mirrors the voice offset” (Lebacq, 2019, 528).

“Vocal onset can be defined”, according to Lebacq, “as the process occurring between the first detectable glottal movement and the steady state vibration of the vocal folds” (2019, 528) which then leads to phonation. Watson concurs with his theory calling the first step “the prephonatory adjustment phase” using “the appropriate tension” of muscles and the second phase “the attack phase” which is the start of vocal fold vibration and phonation. He goes on to explain that the concise

use of onsets and offsets are thought to be linked to vocal health, tonal quality and efficiency by “Voice researchers, teachers, and clinicians” who “have long identified voice initiation as an important aspect of vocal performance” (2016, 1).

McDonnell breaks down the onset definition further stating it is “dependent on the adjustment of three phonatory control factors, subglottal pressure, glottal adduction, and vocal fold length and tension” (2001, 526). This theory takes into account the air pressure coming from the lungs.

Subglottal pressure is the buildup of air coming from the lungs, beneath the glottis, occurring when the glottis is closed or the vocal folds vibrate during phonation.

Glottal Adduction is the closing of the glottis by the laryngeal muscles. This is achieved “in the posterior (cartilaginous) portion of the glottis” by the engagement of “the lateral cricoarytenoid (LCA) and the interarytenoid muscles” (Herbst et al, 2015, 391).

The vocal fold length and tension are controlled by the thyroarytenoid and cricothyroid muscles. These muscles determine the pitch and register of phonation.

Herbst states that the onsets can vary in volume and intensity by controlling “two basic mechanisms”, “the adduction of the vocal folds” and “varying lung pressure” (2015, 391). He also notes that “trained singers seem to be able to vary glottal adduction independently of other parameters” (2015, 392).

Traditional

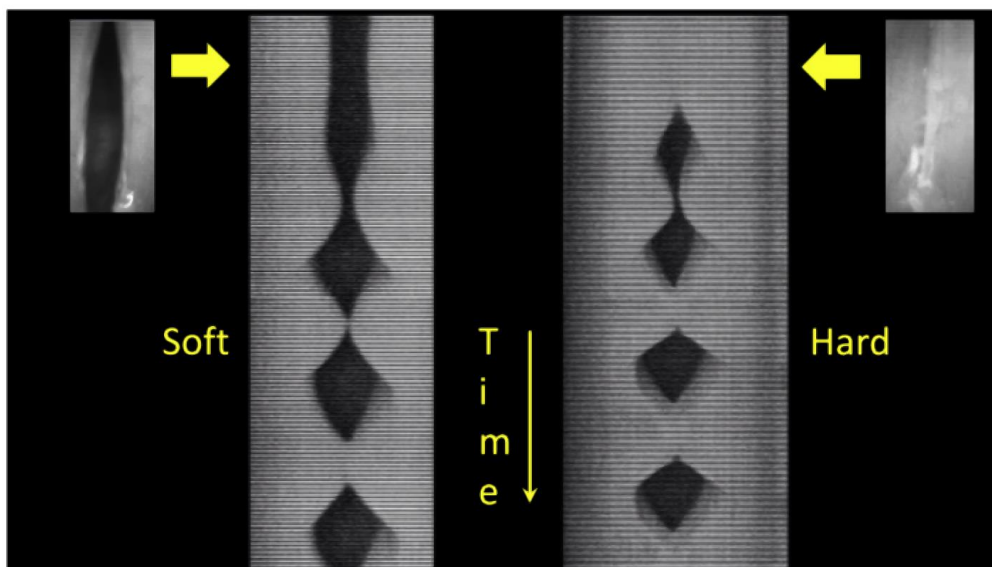
“voice onset continues to be popularly divided into the so-called glottal, simultaneous, and aspirate types” (Watson et al, 2013, 273).

According to Winnie “An imbalance in the relationship between airflow and true vocal folds closure could result in either a glottal or aspirate onset” stating that this “is not typically suitable for classical technique”. However, he does go on to say that these onsets, “can be suitable for CCM” styles and whilst we should explore it in CCM singing it should always be a “conscious choice and not one of habit” (2017, 61-2).

Miller notes that in the glottal onset “there is a greater degree of pressure below the folds” this is because “the glottis firmly closes before phonation” (1986, 3). This pressure beneath the vocal folds is caused by the adduction muscles of the glottis engaging tightly and before airflow which “results in the glottal plosive, a sound similar to a light cough” (1986, 4). In his research he found that with the glottal onset “activity begins early in the vocal muscles and is significantly greater than in the two other forms of onset”, simultaneous and aspirate (1986, 2).

In more recent research Lebacqz has backed up this theory by stating that “the vibration starts from a closed glottis” with “the opening being abruptly forced by the rising subglottic lung pressure” (2019, 528). Freeman et al confirm this theory with their research stating that the glottal onset “begins with adduction of the vocal folds” causing a closed glottis, “followed by an abrupt, rapid abduction of the vocal folds”, opening of the glottis (2012, 229).

In the below image you can see how much vocal fold adduction is visible in the glottal, or hard, onset in comparison with the soft (simultaneous) onset, take note of the significant difference in the small pictures in the top corners.



(Lebacqz, 2019, 530).

While it seems evident from this research that a glottal onset and/or offset is taxing on the singing voice, it can be done lightly causing less vocal fatigue. Because of the emotive and speech like quality of some CCM styles Winnie suggests that a “low-effort glottal onset might be stylistically appropriate for expressive purposes in gospel, rock, pop, or jazz genres” (2017, 62).

This research has changed my opinion of glottal onsets as previously I would have considered them an acceptable onset to use sparingly during CCM singing however now I feel that this onset is rarely necessary for emotive effect and if used in a studio setting should be altered for a live performance. The research into glottal onsets and offsets is very important for efficient vocal use in the industry. Having a good understanding of when to use this onset and that it should be used as softly as possible has the potential to save a singer in stamina and vocal health.

Nothing in technical accomplishment in singing is more beneficial to the vocal instrument than the proper positioning of the vocal folds for the clean onset” (Miller, 1986, 7).

“the perfect *simultaneous attack*” (Vennard, 1967, 42), is considered the gold standard of singing both in classical and pop pedagogy. Freeman et al state that “Phonation onset is important in the maintenance of healthy vocal production for speech and singing” (2012, 226). This is purely for the reason that it is the most efficient vocal use, from a technical and physiological view over a stylistic or emotive one. The reason it is considered more efficient is because of the function of the vocal folds and use of breath.

The simultaneous attack requires the vocal fold vibration for phonation and the airflow from the lungs to happen in unison, creating an even and balanced collision between the two. Avoiding the wasted energy from over exertion of the vocal folds in the glottal onset and making full phonatory use of the air coming from the lungs, unlike the aspirate onset. Vennard proposes that if a singer can find the right balance between airflow and glottal adduction they have “solved the problem” and will have “a good attack”, in other words, a simultaneous onset (1967, 38). His reasoning for this balance being so important at the onset of pitch, is that “readjustment while the tone is being produced is both difficult and unbeautiful” (1967, 38).

In the Freeman et al study on phonation onsets it was noted that the simultaneous onset showed “anterior-posterior compression,” in comparison with the aspirate onset showing “incomplete glottal closure”, “especially at the posterior one-third of the vocal folds” (2012, 229). This incomplete glottal closure is sometimes referred to as the glottal chink.

While I have always been aware that a simultaneous onset is the most vocally efficient choice, I feel this research has really reiterated the importance of doing simultaneous exercises with my students. While CCM tuition should include learning stylistic onsets for different genres, it is imperative that the simultaneous onset is mastered before approaching any other technique. Other CCM onsets may require the use in part of the singers' default onset which would be healthier and more efficient to be the simultaneous, rather than to habitually use a glottal onset.

“The two extremes of incorrect balance which must be moderated are *breathiness* and *tightness* (Vennard, 1967, 38).

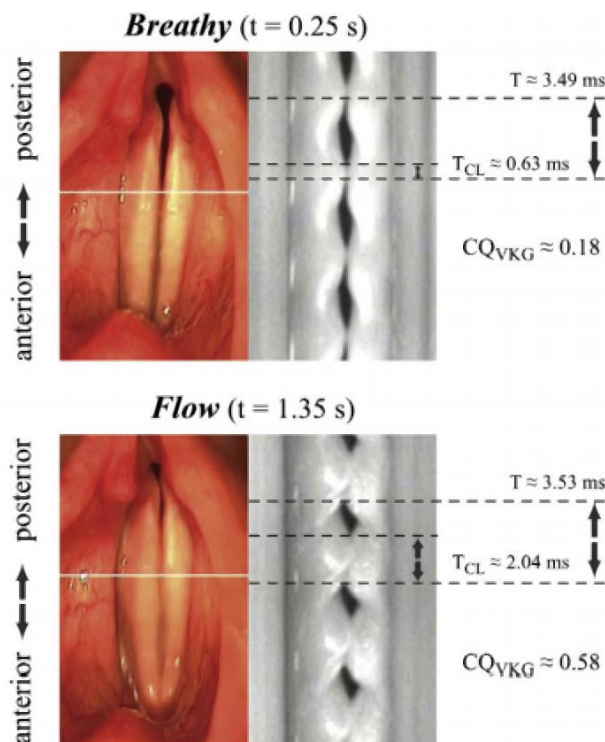
Tightness causes the glottal onset, but breathiness causes what’s known as the aspirate onset which it is “characterized by shortly audible air turbulence preceding voicing”. It is achieved similarly to a simultaneous onset “but evolves slower, with more ‘free’ oscillations before the glottal closure” (Lebacqz, 2019, 528)

Miller states that unlike the glottal onset where the vocal muscles activate and airflow follows, the opposite occurs during the aspirate onset because “A fraction of a second following the aspirate noise

the vocal cords begin gradually to vibrate, until the full tone of phonation is heard” (1986, 3). In the classical world aspirate is, similarly to the glottal, considered undesirable. “If the valve is too loose and allows a waste of breath, either before or during the tone, it will lack intensity and brilliance” (Vennard, 1967, 38). This opinion is still held by the classical voice community however, in CCM styles aspirate onsets, offsets, and even tone, are frequently used at a quiet volume for stylistic and emotive intent.

The research by Miller and Vennard on aspirate onsets is over forty years old and so it could be assumed it was curated with the classical styles of singing in mind. In CCM styles there is less demand on the voice to be self-amplified and clear, therefore using an aspirate onset for character and emotion, if done with good technique and at a low volume is deemed appropriate. The CVT research site suggests that “Air can be done safely” but that “it can only be used at low volumes” (Sadolin, 2014).

Looking at Herbst research into glottal adduction he found that aspirate sounds were “produced with a posterior glottal gap that reached into the membranous portion of the vocal fold”. He could see using a video measurement of the closed quotient of the vocal folds that aspirate (or breathy) tone had a closed quotient lasting “about 0.18” milliseconds “in the middle of the vocal folds” compared with full vocal fold (or flow) closure at “0.58” milliseconds which also “showed a considerably smaller posterior glottal chink limited to the cartilaginous portion of the glottis” (2015, 394). This is shown clearly in the below image.



(Herbst, 2015, 396).

Louie McDonald - 1911460

As previously mentioned, aspirate onsets, offsets and tone are a huge part of the emotive content in CCM styles. The aspirate, or breathy, tone in CCM styles is achieved technically by, reducing “vocal fold adduction and minimal vocal fold contact area, which result in lax singing voice with a high level of turbulent noise” (Kadiri et al, 2020, 34). This would appear to be the same mechanism as the aspirate onset which “shows incomplete glottal closure throughout, especially at the posterior one-third of the vocal folds” (Freeman et al, 2012, 229).

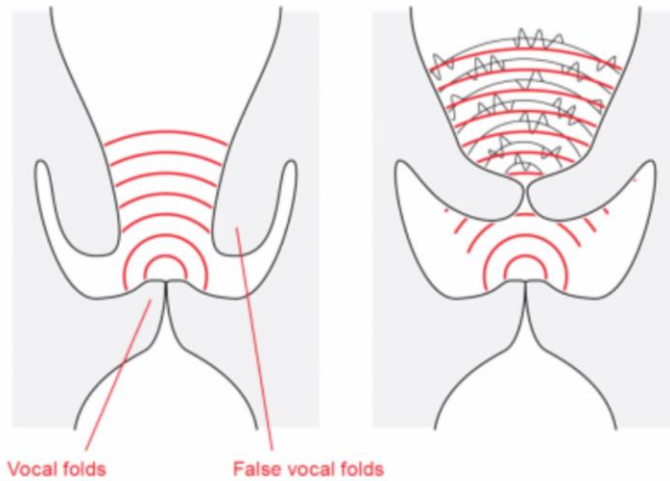
The only difference between tone and onsets/offset is that a singer may choose to use an aspirate onset and then adduct the vocal fold muscles to create a full vocal fold closure later in the sound. The singer could also choose to start to abduct the vocal fold muscle towards the end giving an aspirate offset. If a singer has good mechanical control, they could move between having aspirate onsets, offsets and tone, swapping out one or more for a different vocal fold function as and when it suits the emotive style of the song.

The research above suggests that while breathy tone and aspirate onsets and offsets are suitable to use in relevant CCM styles they should be approached with caution and CCM coaches should make it explicitly clear to the student that they must only be done at low volumes. Learning that the aspirate onset and breathy tone are achieved with much the same function of the folds has helped me develop my strategy for teaching. (See Learning Appendix)

Modern

“Distortion as vibrations of the ventricular folds” (Thuesen, 2020, 162).

The ventricular vocal folds, sometimes referred to as the false vocal folds, sit above the ‘true’ vocal folds and similarly extend into the vocal tract, but according to the results of McGowan and Howe’s research “The ventricular folds do not have a noticeable effect on the voice source” (2010, 1527) indicating they are not necessary for normal phonation in speech or singing. They are however, used in the function of making a distorted sound. The Ventricular folds “do not have a flexible and excess mucous membrane” like the vocal folds do, meaning they cannot “vibrate as fast and delicately”. This stiffer fold vibration “creates the distorted sound” (CVT research site, Effects, Distortion). Caffier states that this is achieved by “the latero-medial constriction” in the ventricular folds (2017, 1). This is backed up by Thuesen, McGlashan and Sadoline’s research on ‘Exploration of rough vocal effects’ with fifteen of the sixteen participants showing that “Distortion was observed as the vibration of the ventricular folds against or adjacently to each other” (2020, 4).



(CVT Research Site, Effects, Distortion).

Herbst et al note that the sound created when vibration of the ventricular vocal folds occurs can have different terminology including; growl, throat singing, vocal ventricular mode and distortion. Distortion, however, also requires the engagement of “other supraglottal structures”, “in vibration” (2016, 37). Thuesen’s study finds that, fifteen out of sixteen participants showed ventricular medial-lateral constriction during distortion and that, it is this constriction and ventricular vibration, combined with the front to back “narrowing of the ventricular folds” (2020, 168) by “a raised larynx”, and the “posterior-lateral pharyngeal wall constriction” which was found to be present in fourteen of the participants.

The research would support the theory that distortion is happening above the true vocal folds and so the vocalist will be able to increase the volume of the phonated pitch independently and underneath the distortion “without damaging the voice” (CVT Research Site, Effects, Distortion).

Prior to this research I knew very little about distortion as it is not a facet I have ever had to use as a performer or teach. Therefore, this knowledge will impact my practice greatly, giving me more confidence to approach this facet as a vocalist and eventually as a teacher. Although there is still much more research to be done on distortion I feel as though the current literature suggests that it can be done safely when guided by a knowledgeable coach. Unfortunately, often there are teachers and performers on online forums who give out advice on practicing distortion that I believe could be detrimental to a singer’s vocal health. This is for two reasons; one is because the advice is not always backed by the most recent research and evidence and the second is because the person reading the advice may perceive it in a different way than it was intended and potentially perform it incorrectly.

Bailly et al found that the vibration of the ventricular folds “was unexpectedly observed in several phonatory gestures” (2014, 1236). Whilst vibration was not observed “A ventricular-fold motion is found” in many facets including, “glides with transitions between registers” (2014, 1219).

“A vocal register is a set or range of serial sounds that are similar in perception and produced by similar vocal fold vibratory patterns” (Herbst, 2015, 391).

Vocal registers are often important in the function of the slide onset and offset. The slide involves moving through a singer’s range up to or down from a note. In order to do a slide onset or offset found in rock music the singer usually needs to have a pitch range of about two octaves. This means that, more often than not, they must be able to transition from M1 to M2 register smoothly. Registers refer to the different timbre of the voice and vibratory pattern of the vocal folds. There are four registers in total and while not all singers can create all of the four registers because of the individuality in size of larynxes, it is expected of all professional vocalists to be able to sing in at least the middle two registers, chest or M1 and Head or M2. Skilled singers have a crossover range of at least an octave between these two registers and should be able to move through these two registers with the ability “to camouflage the change until it is almost imperceptible” (McKinney, 1982, 114).

McKinney suggests that chest or M1 register is the most common vocal fold register saying that, “The modal voice is the normal register for speaking and singing” (1982, 96). During M1 register the vocal folds vibrate their entire mass from muscle to epithelium and perhaps because of this all-encompassing function, it is considered to have “a broad harmonic spectrum, rich in overtones, because of this rolling motion of the cords” (1982, 97). He also states that “A well-trained singer can sing two octaves or more” in M1 and that this should be achieved beautifully, with a range of dynamics and “vocal freedom” (1982, 98). On the other hand, M2, or Head register, only uses the outer portion, or layer, of the vocal folds in vibration.

As in classical singing M1 is the most commonly used register in CCM styles and often CCM singers will only use this register. However, there are some CCM singers who predominantly use M2 register, but most CCM singers will use a combination of both. The change in timbre is usually audible in non-skilled singers and according to McKinney the head voice will sound “breathy and flute-like, with few overtones present” (1982, 99).

In the research of Dippold et al into register transitions of classical and jazz singers it was found that “The differences in vocal fold oscillation patterns” directly relate “to differences in the activity of the dominating muscle”. Where the vocalis in the thyroarytenoid is used in M1, “the cricothyroid muscle” is used in M2. This leads to the theory that changes and adjustments must be made “at the glottal level during register transitions”. This change in vocal fold function can be difficult to master and requires much practice. In this point Dippold et al agree with McKinney’s previous opinion by stating that in less adept singers “audible register shifts can sometimes be observed” (2015, 22).

When Herbst looked at the transition in registers from M1 to M2 he noticed that “the posterior (cartilaginous) adduction was intentionally kept constant by the subject” and that some of M2’s qualities included “lower subglottal pressure” as well as “higher flow” and “a shorter relative duration of vocal fold contact” (Herbst, 2015, 399). McKinney states that the change in chest to head register happens because of “the amount and type of vocal cord involvement” (1982, 100). However, based on Herbst’s more recent research it would suggest that vocal fold involvement is only part of the mechanism and that airflow balance also plays a role. He suggests that in previous research the thyroarytenoid is thought to be “responsible for adducting the membranous portion of the glottis” that is associated with register control and changes. He hypothesizes that this could affect “the pressure-flow relationships during phonation” (2015, 391). The involvement of airflow could be backed up by the findings of the “vocal fold contact duration”, as airflow is imperative to glottal adduction according to the Bernoulli effect. M2 “register was characterized by shorter vocal fold contact duration of about 20% of the glottal cycle”, whereas M1, “had a vocal fold contact duration of about 50% of the glottal cycle” (2015, 393).

As well as the vibratory pattern of the folds during register changes, it should be noted that there are changes caused by the change in pitch. The higher in pitch a singer goes, the more they must lengthen and thin the folds. The lower they travel in pitch the more shortening and thickening of the folds must occur. This is obviously not achieved on a conscious level by the singer but through small muscular movements. When moving from M1 to M2 “the cords are lengthened by the action of the cricothyroid muscles” and the “tension is increased”. “the internal thyroarytenoids” contribute “to the pull of the cricothyroids” causing “the edges of the vocal cords become thinner” (McKinney, 1982, 99).

Through this research I have discovered the importance of registers in slide onsets and offsets and how smooth and quick transitioning between registers can help in the function of slides. While I already do quite a lot of slide exercises with my students, this research has caused me to adapt them to push my students and help them approach slides with more ease and confidence (see Learning Appendix for exercises). This research shows that there is a functional difference at the level of the vocal folds which causes the change in register. CCM coaches need to be aware of this and compete register transition exercises with their students in order to encourage a positive attitude towards the transition by the singer, who will often shy away from this if given the opportunity.

Creak “is used to give the impression of intimacy and nearness, or to indicate that the singer is about to break down emotionally” (CVT research site).

Creak is a similar vocal technique as the ‘Fry’ or ‘M0’ register but when M0 is added on the onset it often requires the inclusivity of a slide. This is because the singer is travelling from below M1, up to their desired starting pitch and must do this smoothly by including the slide. McKinney points out that creak “requires a loose glottal closure which will permit air to bubble through with a popping or rattling sound of very low frequency” (1982, 94). Thurman explains this in his vocal registers conference paper stating that M0 register “is produced when the cricothyroid muscles (lengtheners) are uncontracted so that vocal fold length is determined solely by increases and decreases in the contraction of the thyroarytenoids (shorteners)” this relaxed set up allows for “minimal adductory

force” (2004, 23) which in turn causes minimal vibrations of the vocal folds. This is later confirmed by Wolk et al who deem M0, in part as “intermittent irregular vocal fold vibrations occurring during speech” (2012, e112).

M0 “lies in the lower end of the fundamental frequency” below the M1 register and “minimally overlaps” in pitch range with M1. In Wolk et al’s research they found that M0 “ranges for males (7–78 Hz) and females (2–78 Hz) were surprisingly similar” and although some overlap was present into M1 it was small “71–561 Hz for males; 122–798 Hz for females” (2012, e112).

Caffier believes that M0 “is a further effect of creaky voice with a comparable mechanism” (2017, 5). M0 differs from creak because of the added phonation of the creak onset. Caffier points out that “In the transition to tonality, the length and tension of the vocal folds increase” due to the activation of the cricothyroid muscles. Whereas in fry “the vocal folds are maximally shortened and relaxed” (2017, 5). This relaxation is also caused by the thyroarytenoid muscles which “shortens and stiffens the body layer” (Chhetri, 2012, 1401), thus decreasing the fundamental frequency or phonated pitch.

Creak and M0 should only be done at a low volume which makes it ideal as an onset or offset for emotive effect as the pitch can become louder when M1, M2 or full vocal fold closure is reached. Wolk et al state that if a singer tries to increase their volume on “glottal fry” the “tension of the vocal mechanism” can increase. (2012, e115). This increased tension would not be ideal both because unnecessary tension in singing is undesirable and because it will cause the lax nature of the vocal folds to change, therefore changing the function of the folds.

Chappell et al looked into vocal fry and its use stylistically in singing. They found that “in popular singing styles” fry “appears most commonly at phonation onset rather than at termination” which is in opposition to the speech use of fry which usually occurs at the end of a phrase. It was noted that the vocal fry in singing was used “especially on vowel-initial words and some voiced initial consonants, such as /l/, /m/, /n/, and /r/” (2018, 1).

This differentiation could be useful for developing exercises. Asking singers to use creak at the end of a spoken phrase so they can get used to the feeling before adding it with pitch, music, and rhythm. (See Learning Appendix). This research also shows the importance of a relaxed voice in creating a creak onset and offset, as tension in the folds won’t allow the slack needed to create the sound. Creak is used in many CCM styles including; rock, punk, mainstream pop, blues, RnB, jazz and metal. Therefore, a good understanding of what it is and how to teach it is important for coaches as it is likely to come up in much student repertoire.

Cry or “a vocal break can evoke many expressions such as surrender or devotion” (CVT research site).

Essentially a vocal flip from M1 to M2 register and back again, the CVT research site calls this a 'Vocal Break' but in CCM it is frequently referred to as a 'Cry' especially at the onset of a note or phrase. A number of 'cry' or 'breaks' performed in succession are usually referred to as Yodeling. Yodeling is not commonly used in CCM styles and the cry is usually only done once or twice per phrase in mainstream pop.

The question of convenience over emotion should be looked at when it comes to cry as in the study of Dippold et al into classical and jazz singers they found that some results showed "vocal fold oscillation patterns are more regular during register transition in classically trained singers than in jazz-trained singers" (2015, 26). This confirms the theory that "audible register shifts are not desirable for classically trained singers" (015, 22). However, do CCM vocalist create this flip or change in sound because it is easier or because of emotion? If we look at the history of singing in world music the use of Yodel is an old and prominent facet of singing in some countries which would lead me to believe that cry is an emotive choice rather than one of convenience. It is often added to a sound rather than used as the convenience of moving through register changes which also give the implication of emotive use over convenient use.

The function of the vocal folds in these fast moving and differing voice registers causes "a "build-up" time of about half a second" when moving from M2 to M1. This was because the "subject overadducted the glottis immediately after the change". When moving from M1 to M2 "the vocal folds were abducted" for around 100 milliseconds (Herbst, 2015, 393-4). This could lead us to believe that the build-up time could be larger in a CCM cry than in Classical singing as the cry requires an audible difference between the two registers which could be exaggerated by the adducted and abducted portions of the transition in registers.

The research I have looked at shows me that cry is most likely an emotive choice and therefore could be taught, in part, with emotion. The use of emotion in teaching is not a new concept however it may be overlooked by many CCM teachers in favor of technique. When we combine emotion with direction, we can often create sounds in their most natural form causing little to no impact on vocal health and using energy in the most efficient way.

Conclusion

In conclusion I have gained a much more in depth understanding of vocal onsets and offsets, their physiology, where they cross over with other vocal facets, when they should be used in CCM and how to approach learning and teaching them. This knowledge has, and will continue to, change and expand my practice as a CCM teacher.

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Appendix on Listening

Simultaneous Onset (0.49)

[\(87\) Beyoncé - Halo - YouTube](#)

Listening to the pre chorus of Beyonce's song Halo showcases a pop simultaneous onset.

Glottal Onset (1.13)

[\(87\) Clean Bandit - Rather Be ft. Jess Glynne \[Official Video\] - YouTube](#)

The glottal onset, whilst used in CCM styles, is widely considered undesirable even by those in Pop singing tuition. You can hear examples of this in many pop recordings and whilst it can add a sense of urgency or drama to a vocal performance in a recording studio, it is very taxing on the singer's voice and would usually be considered more efficient to avoid, especially in a live performance where a singer may have up to two hours of material to perform. A good audio example of a glottal onset is Jess Glynne's 'Rather Be' chorus on the lyric 'If' of "If you gave me a chance".

Aspirate Onset (1.45)

[\(87\) Billie Eilish - everything i wanted - YouTube](#)

A great example of an aspirate onset and offset can be heard in Billie Eilish's 'Everything I Wanted' on the chorus lyrics "If I could change, the way that you see yourself". Many of Eilish's songs are a good example of aspirate onsets and offsets but also of breathy tone which is an elongation of the aspirate onset into a sustained tone that has the sound of air in it. This is a great way to create intimacy with the listener but should only ever be done at a low volume. If it is caused by a lack of ability to adduct the glottis and is not a stylistic choice it may become problematic. "Sometimes untrained singers present with this quality as the only one they can produce, due to inefficient cord closure, so it is a priority to work on developing an air-efficient tone first" (Chandler, 2014, 68).

Distorted Onset (0.10)

[\(87\) Etta James - I Just Want To Make Love To You - YouTube](#)

Distorted onsets are used in CCM styles to create a sense of strong emotion. A great example of this is 'I Just Want to Make Love to You' sung by Etta James. The very first lyric has a distorted onset and gives the emotive intent of lust and power. Etta is mirroring the horn part which has an overloaded, raspy sound making sure that her vocal isn't over powered by the instrumentation.

Cry Onset (1.29)

[\(87\) The Cranberries - Zombie \(Official Music Video\) - YouTube](#)

The cry is usually only done once or twice per phrase in mainstream pop but can be seen more often with certain genres and artists such as country music and in The Cranberries song 'Zombie'. The lyrics "In your head, in your head, they are fighting" shows cry as both an onset and an offset.

Rock Slide Onset (2.58)

[\(87\) Billy Idol - White Wedding Pt 1 \(Official Music Video\) - YouTube](#)

A slow rock onset can be heard on the last chorus of Billy Idol's 'White wedding' on the syllable 'gain' of "start again". This example would be useful for someone to practice to get used to sliding on to a note.

Rock Slide Offset (1.06)

[\(87\) The Rolling Stones - Gimme Shelter \(Official Lyric Video\) - YouTube](#)

An example of a slow offset can be heard in The Rolling Stones 'Gimmie Shelter' during the chorus you can hear a very clear and slow slide off the word "Children".

Rock Slide Onset & Offset (2.51)

[\(87\) Bon Jovi - Livin' On A Prayer \(Official Music Video\) - YouTube](#)

Once a singer is confident with the above slower slides a faster example could be introduced such as the ending of 'Living on a Prayer' by Bon Jovi.

Pop Slide Onset & Offset (0.00)

[\(87\) Ariana Grande - God is a woman \(Official Video\) - YouTube](#)

While slides are mainly a Rock facet, they are also used in pop music. However, they tend to be over a smaller pitch range more like a tone. A good example of a pop slide onset and offset is the first lyric of Ariana Grande's 'God is a Woman', "You".

Creak Onset (1.10)

[\(87\) Demi Lovato - Sober \(Official Lyric Video\) - YouTube](#)

A clear use of a creak onset is heard in the pre chorus of Demi Lovato's song 'Sober' at the start of almost every phrase and also as an offset on the ends of the word "Lonely". This sound has been found to "significantly altered listener evaluations of the singers' sincerity/commitment, maturity/

sophistication, naturalness, and confidence” (Chappell et al, 2018, 1). Creak is often seen as “as a marker of youth and emotional earnestness” in young listeners (Chappell et al, 2018, 1).

Fry/M0 (0.55)

[tim foust | can't help falling in love - YouTube](#)

At the listening mark of this song, you can hear Tim Foust sing a D2 which is 73 Hertz placing it within the fry register of male voice. This differs from the sound of the creak “which is found at higher frequencies and is characterized by a perception of roughness and the existence of subharmonics in the glottal waveform” (Chappell et al, 2018, 1).

Chest/M1

[\(87\) Harry Styles - Falling \(Official Video\) - YouTube](#)

Some singers who predominantly use M1 include Mabel, George Ezra, and Harry Styles. Harry’s song ‘Falling’ is a good example where M2 could have been used to soften the ballad but instead Style’s chose to stay in his M1 for the majority of the song giving it that strong mainstream pop ballad sound. When he has repertoire above a certain pitch, he moves to his M2 register. This is because “In order to sing above this pitch level it will be necessary to adopt a new phonatory pattern” of the vocal folds thus transitioning into the M2 vocal fold vibratory pattern. (McKinney, 1982, 98).

Head/M2 (2.54)

[\(87\) "Stand Up" - Official Lyric Video - Performed by Cynthia Erivo - YouTube](#)

A clear and crisp M2 voice can be heard in the Bridge section of Cynthia Erivo’s ‘Stand Up’. This shows how the register can be used in conjunction with the lyrics to create a vulnerable and reflective moment for the singer and audience.

Whistle/M3 (2.47)

[\(87\) Ariana Grande - Baby I - YouTube](#)

While I haven’t discussed M3 in my research I feel as though it is useful to have an audible reference of all four registers.

Appendix on Learning

In this appendix I will explain exercises and techniques to help my students achieve each onset I have discussed in my independent study.

Glottal Onset

- 'Uh Oh'

While the research hasn't altered the exercise, I would have normally use for a glottal onset, it has changed the frequency of using the exercise. I would use this exercise much more sparingly and instruct my students to perform it at a much lower effort level than previously.

Simultaneous Onset

Go between a Glottal onset holding one hand out as a visual representation then do an aspirate onset using the other hand. Once this is mastered try pushing both hands together and forward to combine the two sounds meeting in the middle at a simultaneous onset. This is an exercise I learned from studying with Kim Chandler.

Aspirate Onset & Breathy Tone

Practicing sounds like a sigh or whisper at a low volume is useful for the student to get a feel of lots of air moving through the folds with little to no phonation. The easiest way to achieve an aspirate onset and/or offset is by putting a 'H' on the beginning and/or end of the sung phrase. The research I have done has shown me that I can use the aspirate onset and offset to help a student learn breathy tone. If I ask them to put the 'H' at the beginning and end of every word the singer will create at least a breathy sound at the start and end but should be able to, with practice, make the whole word breathy. The next step on from this would be to remove the audible 'H' and replace it with only the thought of the 'H'.

Distortion Onset

Despite learning more about the distorted voice function I still do not feel comfortable in the practical teaching of it. I now have researched the function of the ventricular fold in distortion but as Bailly et al found in their research, singers do "not have a proprioceptive feeling of the ventricular contact or vibration" (Bailly et al, 2014, 1229).

Until I address the exercises and technique with my own vocal coach, I feel it would be irresponsible to teach it to my own students.

Slide Onset

For a slide onset and offset it is necessary to explore the smooth transition between M1-M2 and back again. While I already frequently use slides between major thirds, perfect fifths and octaves, the research I have done has shown that I can push these slides to reflect more of the repertoire. I now ask students to do different small intervals and with more experienced students ask for slides ranging one and a half to two octaves in range. I believe with professional students I could ask for up to two and a half octaves. I usually use the vowels 'ooh' at the bottom end of the range and 'ee' at the top end of the range.

It is useful, especially in male students, to explore the register change between M1 and M2 and back again over these slides as it can be quite clunky with an audible gear change between the registers. Practice of moving between these registers will over time make the transition less audible for the listener and more comfortable for the singer.

Creak Onset

Asking students to croak like a creaky door, a toad or white noise can be useful in exploring M0. This can be helpful in leading onto asking students to imitate famous voices that use creak at the ends of words. This can be a useful tool for initiation of exploring the feeling. Some examples of famous shows or celebrities using creak at the end of speech are, Made in Chealsea, Keeping up with the Kardashians and Billie Eilish. Once students have the feeling of creak you can then add it to the front of a pitched sound. A good example for students to imitate is Britney Spears - One More Time on the starting lyric "Oh" of "Oh baby, baby".

Cry Onset

Moving from M1 to M2 and back again at a slow pace and then gradually building speed can be a useful way of getting the feeling for the singer. Asking students to be a little silly and mocking or a yodel sound can also work well. This will hopefully lead to the student being able to flip the voice between M1 – M2 and back again in a cry sound. Once the flip is mastered then it can be introduced to onset and offset of pitch or lyric.

In conclusion, using emotion to create sound can be helpful in all voice use as "Research has shown that basic emotions are crossculturally the easiest to express and perceive in music" (Hakanpaa et al, 2019, 1). Remembering to reference back to the emotional intent of each facet is a great motivator for students and can often lead to an easier access to the vocal function.