

BMPF7003: Part 1

An investigation into the historic research of Twang.

This study will explore the research of key theorists that have published literature on twang and their perception of the topic. With the aim of extrapolating this research, this paper will investigate the key themes that are embedded within these papers to create a summary of how twang has been brought forward within the last ninety years, with the view of using these findings to inform my understanding of twang, applying it to my own practice and allowing my clients to make gains. Working as a singing instructor, the majority of voices that I come into contact with are those between the ages of 13-30. The main motivation behind researching twang is to advance my knowledgebase for my own teachings. With researchers publishing conflicting views on what constitutes as twang, there is uncertainty as to what is physiologically correct. This being said, research has been brought forward from previous decades, with increasingly accessible examination apparatus available and more meticulous studies have taken place, with objectives that endeavours to answer questions. We can see from recent work that there is an element of transparency and some acceptance how twang is produced in a human voice. This paper will explore submissions from 1863 with a view of assessing its relevance to practice.

“Twang quality is a bright, piercing quality often produced in contemporary pop/rock/country music, musical theatre singing, and character voices” (Perta, Bae and Obert, 2020, p. 1) this narrative of twang is consistent in other work, such as (Sundberg 2010) who suggests that twang is typically associated with loud and high-pitched signing; (Yanagisawa et al., 1989) implies that twang has a piercing nature and can be associated with hillbilly singing. Historic research agrees that there’s still effort required to create a universal understanding of twang, with Sundberg commenting “Voice research should be capable of resolving such a terminological confusion by describing the acoustic, perceptual and physiological characterises” (Sundberg, 2010, p. 1), corresponding writing can be found in Perta, Bae and Obert’s study, they add

to the topic “as significant variations in voice quality can exist within a genre, there appears to be a need for more specific terminology accompanied by physiologic explanations” (Perta, Bae and Obert, 2020, p .1).

Literature on twang dates back to the 19th century, though substance was added to the topic from 1930 with Richard Paget’s *Human Speech* which references twang as a ‘nasal quality’ to which he theorises that twang is perhaps a result of some constriction within the pharyngeal space. In addition, Paget quotes a supporting passage from Leonard Pieter Hendrik Eijkman’s 1926 paper titled ‘*The Soft Palate And Nasality*’. Eijkman proposes that the narrowing of the uvular complements this phenomenon of ‘additional resonance’, Eijkman continues “for the smaller this aperture becomes, the nearer the palatopharyngeal folds will approach one another” (Eijkman, L.P.H, 1926). Writings were published pre 1900 with Hermann von Helmholtz first recognising the phenomenon in his 1863 ‘*On The Sensations Of Tone*’, specifying his findings attributed to male tenor singers during a forte phrase of singing. Helmholtz supplements his perception “these partial tones sound like a clear tinkling of little bells, accompanying the voice, and are most audible in choruses, when the singers shouts a little” (von Helmholtz, H. 1885).

Yanagisawa, Estill and co. conducted an endoscopic study in 1989 that saw five singers of professional status demonstrating twang to establish whether there was aryepiglottic reduction during the manoeuvre of twang. The parameter of the study was to perform *Happy Birthday*, trad. and a series of phrases of Salisbury and Stafford Smith’s: *Star Spangled Banner* (Yanagisawa et al., 1989). Three questions were asked in the study: “ (a) is this aryepiglottic constriction a legitimate and consistent feature of a particular voice quality or a particular singer? (b) Is it typical of all types of singing in general? (c) Is it evident of abnormal laryngeal function for which corrective action should be taken?” Study subjects were given autonomy over pitch during the investigation, though researchers required participants to use /i/ as the selected sound, due to the naturally forward epiglottic position (Yanagisawa et al., 1989). The results of the endoscopic inquiry consisted of five participants (three male baritones with the average age of 46 and two females with the average age

being 28). Researchers observed a decrease in the aryepiglottic space, specifically in the anteroposterior direction (AP), noting a distinct posterior movement of the epiglottis during twang. The study further concludes that there was visible narrowing of the aryepiglottic orifice during phonation at the 3 kHz region, also referred as the 'singers formant', a concept written by Sundberg and is defined as a "high spectrum envelope peak near 2.8 kHz" (Sundberg 1974). Prior to this science-based result, there was very little published on the benefits or drawback on the use of twang and the relationship between using twang and one's laryngeal hygiene. The authors endeavoured to answer preconceptions approaching laryngeal constriction and the notion that a constriction at the aryepiglottic fold would somewhat deteriorate the voice. The researchers add "we felt that this voice had not suffered any ill effects from this constrictive behavior" (Yanagisawa et al., 1989, p. 342). This study discusses the potential benefit to application of twang to the voice practitioner, suggesting that the narrowing at the aryepiglottic region is found in primary functions of the voice, such as swallowing. This body of research formed the initial stage of the science-based twang study series, to be completed by, and gaps in the knowledge filled by future research.

(Titze et al., 2003) led a perception-based study using computer synthesised samples that were assessed by a panel of volunteers, all with varying musical abilities. This study measured the judge's perception of twang on a scale of 1-10. The research discusses the findings and gives emphasises on the degree of open quotient. Volunteers associated twang with a greater closed quotient which this is also evident in the results in progressive studies (Sundberg and Thalén, 2010), furthermore listeners correlate twang with a narrowed pharyngeal area, which supports previous researcher's hypothesis (Paget 1930). In addition to this, Titze explores a further factor relating to the vocal tract length; listeners identified twang with a shorter vocal tract. Titze accepts the limitations of this study and explains "the results do not exclude the possibility that other parameters may contribute to the perceptions of these qualities, but given that the selected parameters capture many of that physiologic changes observed endoscopically, some confidence in the results is warranted" (Titze et al., 2003, p. 155). With this research, voice practitioners

are able to use this data in line with their teaching practice. Voice professionals can take findings such as *greater closed quotient; narrowed pharyngeal area; shorter vocal tract* and experiment in their teaching environment. This research provides a clearer direction through some physiological manipulation needed to create a twang sound, thus this perception-based study has provided support to the application of practice.

(Sundberg and Thalén, 2010) conducted a perception test, with a limiting participation pool of one female. The study consisted of six listeners, all either singers or teachers “well acquainted with “twang”” (Sundberg and Thalén, 2010, P. 655). The study aimed to provide support to Yanagisawa, Estill and the work of Titze. Researchers instructed the female jazz and pop professional to sing pitches C4, E4, G4 and C5 in twang as well as phrases from Wolinski’s “*Ain’t Nobody*”. The latter component was to be sung with the intended lyrics intact and a further instruction of singing the pitch on a /pæ/ sound. In short, researchers Sundberg and Thalén found that their listeners, with the exception of one rating, recognised the intended twang in the voice of their female singer. In addition to these findings, researchers observed the lowering of F₃, theorising that some adjustment is made in the cavity that locates the tip of the tongue and the lower incisors. Sundberg and Thalén finally conclude with the potential benefits of using twang as a vocal hygiene strategy, which coincides published work (Lombard and Steinhauer, 2007), that conclude in their paper that twang has the clinical capability to provide hypophonic patients with assistance. These meaningful findings can be used to benefit the practitioner and the student, with publications (Lombard and Steinhauer, 2007) clarifying the safe use of a narrowed pharynx. With singing education, such research can be used to treat students that find it difficult to project their voice with chosen repertoire, relieving areas of voice production, such as continuous overloading subglottal pressure, which can become taxing on the voice-user. With supporting research with regards to the safe benefits of using twang, this work should offer reassurance to the voice practitioner.

Agreeing with the opportunity of using twang in a clinical setting, (Perta, Bae and Obert, 2020) investigated the physiological changes to the vocal tract through Magnetic Resonance Imaging (MRI), with the view of clarifying previous submissions of what constitutes as twang. Whilst the use of an MRI scanner isn't a newly found approach to voice science, the researchers of this 2020 study are the first of their kind to undergo twang investigation through the means of an MRI. Such means of examination allows the participant to manipulate freely, with no internal obstruction from inspection equipment. This inquiry saw researchers working with five participants (three females and two males) with the age range of 47-61 years. For assuring results, all participants boasted of a wealth of qualification and experience within the professional voice industry. In addition to formal qualification, all partakers were qualified in some capacity with the Estill Voice Training programme. The study was perceptually rated, with two panellists rating their perception of twang (%). Researchers prescribed all subjects with a laryngoscopy examination prior to MRI screening. Contributing members performed oral twang, rather than nasal twang whilst laying horizontal in the MRI scanner. Work previously published (Steinhauer, Mary McDonald Klimek and Estill, 2017) provides an understanding of both nasal and oral twang with the differentiation being the location of the inferior tip of the soft palate, located posteriorly from the hard palate. Researchers collected the MRI data of two successful participants, whilst the remaining three participants failed to complete the full, necessary brief. They add "difficulties experienced by the participants included inability to sustain the voicing tasks for the entire 18-s scan duration (two females) or produce the targeted twang quality adequately (one male), partly attributable to the lack of auditory feedback due to intense MRI noise". This study gives confirmation to previous work (Titze et al., 2003; Sundberg and Thalén, 2010) regarding an elevated vocal tract during twang. Investigators Perta, Bae and Obert analysed the velar height and discovered that there was no profound difference in the height on the /i/ sound during twang and speech (Perta, Bae and Obert, 2020). This research also endorses the submission by (Titze et al., 2003), noting that there is evident lateral pharyngeal narrowing during twang, giving debate to previous work (Sundberg and Thalén, 2010). The study discusses the possibility of using consistent terminology to describe the new physiological findings, proposing

the use of “supralaryngeal narrowing”, which is a shift in research from previous findings (Steinhauer, Mary McDonald Klimek and Estill, 2017) that give support to the notion of aryepiglottic constriction. Contributing to twang theory, the researchers observed the disappearance of the vallecular void during twang. The perception test component of the study found that both judges identified the intended twang samples within the pool of deliberate, randomised samples of varying vocal placements. Authors discuss their limitations, which gives scope for further study “the supine position of the subjects in the typical MRI environment may affect the position of the larynx and the jaw during the voicing tasks, with the larynx more elevated and the jaw more protruded than in the upright position. Thus, the degree of laryngeal elevation in the present study might have been attenuated because the larynx was already heightened by nature of the supine position” (Perta, Bae and Obert, 2020, p. 6). Recognising this limitation doesn’t detract from previous findings (Yanagisawa et al., 1989) that correlate laryngeal height with twang. It is noted that an examination of the aryepiglottic territory whilst the subject is performing twang through the means of an MRI would offer further clarification as to whether the subject uses aryepiglottic narrowing. Additional research could also measure the velar height on various other sounds. This would give support to claims made (Steinhauer, Mary McDonald Klimek and Estill, 2017) regarding the differentiation on oral and nasal twang; giving consequential data as to the degree of height through different sounds, whilst monitored on an MRI scanner. This could offer support to voice practitioners when applying this theory to practice of not always *lifting* the soft palate during singing/ voice production.

I accept findings from all scientific studies, though through research I find the following the most useful to take forward into my own practice, but not limiting to:

- **Vocal tract height**

I recognise from recent research (Perta, Bae and Obert, 2020) the importance of laryngeal height during the placement of twang.

- **Narrowed pharyngeal space**

This leading concept has been dominant in works (Paget, 1930; Titze et al., 2003; Sundberg and Thalén, 2010; Perta, Bae and Obert, 2020). Though there is still effort to clarify if there is AP or medial narrowing, regardless there is clear evidence in the studies above of some form of “supralaryngeal narrowing”, a newly found proposed definition from recent work (Perta, Bae and Obert, 2020, p. 6).

- **Fronted, heightened tongue position**

Complementing the notion of a shorter vocal tract, the fronted, heightened tongue (Yanagisawa et al., 1989; Steinhauer, Mary McDonald Klimek and Estill, 2017) has been documented to help the perception of twang (Perta, Bae and Obert, 2020). It would seem logical to include a retracted tongue base to aid the shortening of the vocal tract.

- **Greater closed quotient**

Research promotes the degree of closed quotient as a component of twang (Titze et al., 2003; Sundberg and Thalén, 2010). These findings are endorsed in most works (Saldías et al., 2020; Perta, Bae and Obert, 2020). With researchers (Perta, Bae and Obert, 2020) adding their view of a smaller quotient complements the control of airflow; voicing a decrease of breathiness in the sound.

Concluding this exploration into twang theory, there is an aspect of cohesive findings that weren't particularly present before 2000 due to the lack of science-based results. There has been an evolved progression with the dedication from current theorists and thier recent work. Though questions are still to be answered, the understanding of the topic should become more universally appreciated, with innovative research taking place.

BMPF7003: Part 2

A reflective review of my recent research

As a voice teacher, I am constantly reviewing my practice to give my clients the best service possible. The work of (Schön, 1983) resonated with me with his approach to reflection. The two framework markings that Schön mounts his work on '*Reflection-In-Action*' and '*Reflection-On-Action*' gives a practitioner like myself a firm platform to reflect my teachings upon due to the '*on-the-spot*' nature of the profession (Schön, 1983). Schön adds "make on-the-spot adjustments to the sounds they hear" (Schön, 1983) This paper intends to focus on the first term '*Reflection-In-Action*'.

In addition to Schön, I will use the interpretation of (Borton, 1970) model, developed by (Driscoll, 2007) as a second point of reflection. The undoubtedly simplistic, direct approach to thinking and delivery seems fitting for the purpose of my workplace. "*What, So What, Now What?*" (Borton, 1970; Driscoll, 2007) have taken place subconsciously in my reflection routine prior to this paper, though now there's an element of togetherness going forward with the understanding of why it's been part of my routine. As a practitioner I have always wanted to broaden my knowledge of voice pedagogy; having enrolled on the MA Professional Practice (Voice Pedagogy) has given me the opportunity to fulfil '*Now what?*' and designate time to research in addition to working in the environment. This course is giving me meaning to progress as a voice researcher.

There is a level of *grey* over the placement of twang and I certainly became conscious of the use (or *overuse*) of this in my personal singing. The direction of twang was introduced by my first singing instructor and there was an overwhelming focus of twang as a Classical and Musical Theatre student. Reflecting back to my early years of singing performance, I ask oneself if this was a response to the work of hypophonic research, though to my understanding this wasn't something that was a personal principal drawback. I found great difficulty to perform subtler repertoire during my first year on my undergraduate degree and I theorise this is a consequence of such methods.

Prior to enrolling onto MA Professional Practice (Voice Pedagogy) I had explored various avenues and discovered models in which singing research is taught commercially and found use of some approaches and teachings, whilst others I appreciated and then discarded respectively.

Before this research, the teaching of twang was apparent in my studio with selective students, to which I hypothesise the sound would flatter that chosen genre/mood. In a profession where multiple options (or placements) can be tested, there is a duty to fulfil the sound required or desired. (Schön, 1983) provides an initial step with regards to *Reflection-In-Action* "The practitioner conducts an experiment in reframing the problematic situation" (Schön, 1983). The term '*experiment*' applies sufficiently to voice pedagogy, with the occupation's responsibilities demanding quick-thinking responses. Voice practitioners alike will come into contact with students that present bad habits and it's with quick thinking that the practitioner can assess and test varying exercises to either release tension and/or correct unsafe placement. In my experience with teaching twang to benefit performance (or phrase of singing), I have become aware of the psychological issues that twang can contain when experimenting with exercises in the early stages of use. (Schön, 1983) asks the question as to how the practitioner uses previous experience to advance the situation. It's a frequent occurrence when the voice practitioner is presented with a student that lacks confidence, which when paired with an overwhelmingly energetic sound such as twang, the resulting tone that is outputted by the student may not fully coincide with the desired instruction and with experience of this, expectations of those with confidence deficiencies are somewhat differentiated from a student that presents themselves with confidence. (Schön, 1983) thirdly asks how the instructor would negotiate, should there be limitations to the situation. Introducing a student to twang to achieve some gain is taken with great caution with my practice, but outlining the need to experiment to the student gives a more relaxed feel to the expectation. Promoting praise and encouraging the student to lose inhibitions with noises that sound immature can be a productive route to success. With situations where I find the student may need more support, I use a three step model: '*I do, we do, you do*'. I have great success with this framework. Answering Schön's third question- we continue to experiment each session. There is also a level of reassurance that takes place before

the student leaves the session with regards to learning curves and that it's perfectly acceptable to not get something right in the first instance.

Taking the model of (Borton, 1970) through the development of (Driscoll, 2007), there is a three tiered journey through the reflection of practice to be had - "*What, So What, Now What?*" (Borton, 1970; Driscoll, 2007).

What is the research?

I started initially researching artists that used twang in their singing, together with pockets of Musical Theatre performances that use the placement for purpose. Before reading into primary sources, I wanted to answer a question: does all performances of twang sound the same? – No.

Touching on the topic of twang as part of a formative assignment, I realised the sheer complexity of the placement and wanted to investigate the subject in greater depth and to do the exploration of the topic justice in this two-part paper. Reviewing the formative assignment submission during the process of writing this module, I found gaps in my knowledge that I didn't see at the point of writing earlier this year. (Driscoll, 2007) suggests giving a clear understanding of the situation at hand and this was achieved by researching key theorists and their contribution to the phenomenon. I set out to creatively map my current understanding from previous CPD courses and correlate this with scientific evidence. There were confictions with my prior knowledge and the scientific research published (as predicted). Conflictions with my knowledge were as a result of previous CPD and published media (Steinhauer, Mary McDonald Klimek and Estill, 2017) that was taught prior to this course. As discussed in part 1 of this paper, I understand the current science-based theory behind twang and appreciate how this can be applied to my practice.

So what – how has this impacted personal teaching?

Taking updated science-lead findings and applying them to my practice has changed my perception of the topic and has given confidence to my teaching. As written above, there was some hesitation whether I was teaching it correctly prior to my research. With previous CPD on how to achieve and teach twang, this relied heavily on imagery, such as '*a witch cackle; a goat noise; a munchkin-like /næ/*'. Whilst I did achieve some success with these exhausted sounds, the newly-found research has given a heightened approach to my twang pedagogy. Learning through experience (Borton,

1970; Driscoll, 2007) is a phrase that summarises the academic exercise and with regards to applying twang theory to practice, this study has given an uplift in knowledge with the opportunity as a practitioner to use the physiological characteristics found in trusted research and apply it, with confidence of being able to isolate components of the completed placement, such as *'heightened tongue (sounding an /ng/ siren); tongue retraction (singing a minor fifth /a/ with tongue root on the 1st, 3rd with the tongue marginally retracted and the 5th with tongue retraction over the lower incisors); shortened vocal tract (sounding a /ey/ "ey/ Hello!" (with excitement); narrowed pharyngeal space (channelling a Kermit the Frog sound, being cautious of inevitable tongue root presence); greater closed quotient (building subglottic pressure and expelling a sustained /a/)* '. I have experimented with this isolation format in my sessions with three subjects and have found that applying exercises to these isolations, then asking the student to combine two or more isolations has achieved a greater level of twang than in my previous teachings. I have witnessed quicker responses from my three subjects (aged between 15-17) with regards to demonstrating isolated tasks, which has informed and aided other areas of my teaching with these students. I have found that these three subjects are more confident with manipulating their voices to my instruction. Although teachings of the anatomy are embedded within my practice, I will take my research and further this within other topics of the voice.

Now what could progress this development?

Prior to exploring the research on twang, I was certainly closed minded to the benefits it has on one's voice. There have been large gains in my teaching since discovering the possibilities that twang has and the advantage of coupling several isolated components together to achieve an alternate sound. Though I have worked through the research that has been published, there is still effort required to bring a more universal understanding of twang to the vocal pedagogy community. Does twang have the ability to change behaviour? (Driscoll, 2007). There's recently published work (Perta, Bae and Obert, 2020; Saldías et al., 2020) that will offer some assistance to voice practitioners, with a hopeful approach to appreciation and the assurance regarding the health risks. Taking great interest in this topic, there is scope for further development with taking current research and answering other questions, such as further development from work published (Perta, Bae and Obert, 2020). There is an

unanswered question regarding the upright position of the human subject through MRI screening. We have seen from previous research that there's a naturally higher larynx during the supine position (Traser et al., 2013) and this is further questioned as to if the larynx would move superiorly by the same scale compared to supine (Perta, Bae and Obert, 2020). I am motivated to advance my skills and knowledge base on the science-informed approach to voice pedagogy research and have been inspired by the possibilities that lay ahead of my career in research. I would welcome the opportunity to observe and collaborate within a science based study in the future.

Personal Development Plan:

Why am I doing this course?	I have wanted to further my understanding of the voice, with not studying the voice intensely during my undergraduate degree. I have a high regard for the research that is being published on controversial areas of voice production and I would personally like to contribute to the research community.
What is the direct benefit to me?	This course has allowed me to designate time to research and give meaning to exploring and documenting voice science. This course has already had a direct effect on my practice with recent findings, which has given confidence in my understanding and approach to application.
Previous qualifications:	B.A Hons – Musical Theatre, 1 st class.

Developmental area: 1) Develop a more sophisticated approach to applying twang to voice practice 2) Develop a greater understanding for assessing voice production through varying examination methods. 3) Nominate time and structure my default diary to allow for greater depth of research	I have loosely tested and measured a teaching strategy that works with the application of twang to adolescent voices, though there is room to improve this employment of technique. I will develop a structured teaching resource that will benefit my practice. Deadline: January 2021 Through the means of primary research and potential sessions with professionals in this field of voice pedagogy science, I will become more aware of the benefits and drawbacks of using such examination apparatus. Deadline: Late 2021 There is certainly room for improvement when carving time out of my timetable and designating this time to research. I will consult with my team and delegate more manageable to grant routine time for research each week. I feel this is one of the obstacles that requires attention. Deadline: Immediately

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