THE REED REALLY MATTERS: THE IMPLICATIONS OF REED MAKING FOR HELPING HIGH SCHOOL STUDENTS LEARN TO PLAY THE OBOE

By

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Abstract

This research study examines oboe reed making and analyzes its ability to aid high school students in playing the oboe. I used qualitative research methods to collect descriptive data on the reeds I made, make observations of the high school students playing on those reeds, and transcribe students' observation of their sound. I surveyed existing reed making literature from oboe scholars and used this to help analyze my findings. I have concluded that, though there is no one correct method for making reeds, high school oboists tend to favor reeds in which the blend area and other transition areas of the reed between its main sections of the tip, heart, and window are well developed. This creates a reed that has ease in producing sound without being too easy, and therefore, flat to play on.

Key Words: oboe, reed making, high school students, producing sound

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CHAPTER I: INTRODUCTION

Introduction

There is no one way to make an oboe reed. This is quite possibly the greatest lesson an aspiring oboist can learn. I have only recently arrived at this conclusion after twenty years of learning the oboe. It was both the successes and failures of my reed making that showed me its highly personal and individualized nature.

Every oboe teacher I have worked with over the years has had their own method of reed making. Throughout my career, I find that I have learned new and unique facets of information from each teacher I have studied with. Oboe reed making, especially reed making for oboists other than myself, is like a giant jigsaw puzzle whose illusive final image is one of inclusivism and subjectivity in reed making. There are many correct ways to make a reed. Every teacher of mine brought another puzzle piece or aspect of reed making to the table, and each new piece of information helped to mature and refine my own reed making.

Early on in my study of reed making, I mistakenly believed that, because my finished reeds were nowhere near the level of my teachers' reeds, I was constantly failing in my attempts to become a reed maker. I was failing to replicate their techniques. I was failing to produce a well-structured, functional reed. I was spending money on reed making equipment and supplies that seemed unwarranted without any promise of improvement. Frustration was my long-suffered company as I followed the advice of my teachers and kept trying. Though obvious to me, my teachers did not see me as a reed making failure.

Somewhere during the many long hours of reed making, I found myself beginning to experiment. Without even noticing, my reeds had become slight variants of the reeds of my teachers. My teachers had taught me the importance of balance, symmetry, and structure in a reed, and, rather than allowing myself to become inhibited by these ideas, I instead used them as a foundation to build upon. I was finally beginning to form my own unique puzzle piece to add to the reed making puzzle. I realized that I had been trying in vain to complete the entire reed making puzzle, rather than my own puzzle piece. I had been trying to solve my reed making woes within the limited parameters of the methods and practices of my teachers, rather than understanding that my knowledge of reed making could someday be valuable and stand alone. My teachers had never wanted me to rigidly stick to their methods and practices. They wanted me to develop my own voice, to form and perfect my own single piece of the reed making puzzle. As it formed, I began to see that my puzzle piece was beautiful and entirely unique. It would perfectly snap into place as another experiential addition to the reed making puzzle. Like my teachers once did for me, I can share my own reed making observations and conclusions with the knowledge that some aspect within will hold true for other reed makers, musicians, and educators.

Purpose Statement

The purpose of this thesis is to develop an overall better understanding of oboe reed making and discover how it can help high school students in learning the oboe. To accomplish this, the needs of various student oboists are identified, and reed making solutions are applied. This thesis seeks to answer one specific research question: how can reed making and reed choice help student oboists become more successful?

Importance of the Study

The information in this thesis will be of value to oboists of all levels because it demonstrates the transformative nature reed making can have on an oboist’s sound and abilities.

Because this study also identifies the typical playing abilities and needs of high school student oboists, this research is also valuable to oboe teachers. Through this study, non-oboist musicians will also be given a few basic tools to evaluate oboe reeds, which makes this research especially important to school band directors. Reed makers will learn about the many different observations, theories, and practices held from a variety of oboe and reed making scholars. Most importantly, though, this study will encourage the learning oboe player to discover the many wonderful nuances of oboe reed making technique.

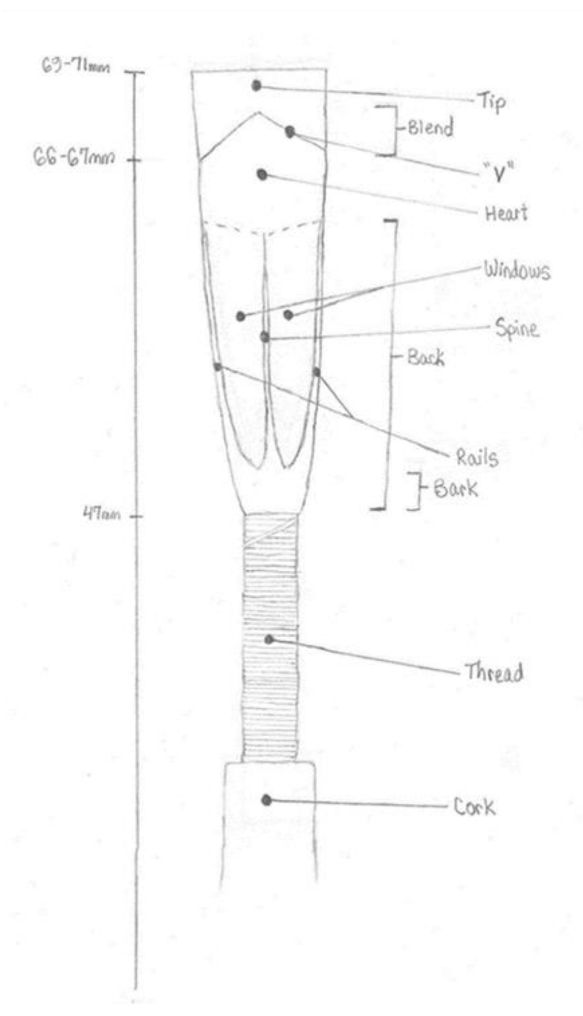
Definition of Terms

In order to better understand oboe reed making, it is necessary to define a variety of terms. Simply put, an oboe reed is constructed using a folded piece of cane, thread, and a staple. A staple is a tube of nickel-silver or brass surrounded by cork on the bottom that most commonly measures a total length of 47 millimeters. The cork on the bottom of the tube cushions it as it gets inserted into the oboe, connecting it with its bore. The folded piece of cane gets tied to the nickel-silver or brass part of the staple with the thread in order to create a reed blank. It is from this tied reed blank that scraping can begin.

It is important to note that, before becoming a small, folded piece of cane that can be tied onto a staple, oboe reed cane, specifically “Arundo donax, a…perennial grass species” is harvested as larger tubes of cane (Salter, 2018, p. 5A-159). These tubes of cane need to be split apart, gouged to initially thin the cane, and shaped before they become pieces of folded cane from which reed makers can begin the reed tying process. While I do not address splitting, gouging, and shaping cane for the purposes of the research study, these elements of the reed making process can help determine the curvature, shape, and quality of the cane, which can in turn affect the quality of the reed created in the reed making process. For this study, I began with pre-gouged and pre-shaped cane. I used the Mack-Pfeiffer and Gilbert-1 shapes from the *LC Double Reeds* website (lcdoublereeds.com). I used 47-millimeter, thinwall silver staples called "Stevens #2" from the *Midwest Musical Imports* website (mmimports.com). For thread, I used "Rigotti Nylon FF Thread" also from *Midwest Musical Imports*.

Figure 1.1

Diagram of a Finished Reed

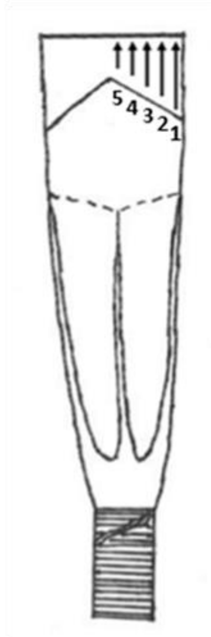


Note. Original drawing by the author

Figure 1.1 shows a finished reed that has been tied and scraped with its interworking sections labeled. The very end of the reed farthest from the thread is called the tip, and it is the thinnest part of the reed through which vibrations travel. The very outer corners of the tip are its thinnest area, and they help create clear articulation and response of the reed. The heart, sometimes also referred to as the hump or plateau, is the thickest scraped part of a reed. Its function is to bring warmth and depth to the tone. Separating the tip from the heart is the “V,” which is a very distinct shape that can be seen on a finished reed. The “V” defines the bottom of the tip, the top of the heart, and helps define the blend area. The blend area also separates the tip from the heart and is defined by a tapering from the thickness of the heart to the thinness of the tip. Some oboe reed making scholars see the blend as being located entirely above the “V,” while other scholars include a small portion of the top of the heart with the blend area. It is important to note that there is also tapering within the tip, as shown in the second diagram above, both from back to front and from center to side. In order to attain this tapering, reed makers will sometimes utilize the “5-4-3-2-1” method, which facilitates the desired tapering structure of a thicker center sloping out to thinner outside edges. *Figure 1.2* illustrates this method.

Figure 1.2

5-4-3-2-1 Scraping Method



Note. Original drawing by the author

For the purposes of this research study, I locate the blend area as further down the reed, behind the apex of the "V" at the very top of the heart.

The length of a finished reed from cork bottom to tip should be 69-71 millimeters, and the lowest part of the "V" should measure in at 66-67 millimeters. The dotted lines on the diagram signify the imaginary division between the heart and the windows. A few reed making scholars will add a small divider here similar to the "V" called the catch in order to separate the thickness of the heart from the thinness of the windows. The catch is not commonly included by scholars as a prominent reed section. The windows or channels are the two vertically scraped channels down the back of the reed. The very center of each window should be the next thinnest part of the reed. While thinning the tip makes the bright overtones more prominent, scraping the windows of a reed adds prominence to the more middle and dark overtones. The American-style reed, which I use in this study, can be best characterized by its unique property of this prominent scraping out of the windows. Outlining the windows are the rails and spine. The rails of the reed are thin strips of bark (unscraped or minimally scraped) running up the side edges of the reed from the bottom portion of the cane into the heart. They give the reed stability and prevent the leakage of air. The spine is a line of reed thickness running up the middle of the reed, most prominently seen below the heart. It helps maintain the reed's structure and balances out the bright overtones of the tip by adding in darker overtones. It is easiest to listen to and evaluate a reed's overtones by "crowing" it. This means that the reed is played on its own with the entirety of the cane in the player's mouth and is a crucial tool for reed makers. At various points throughout the reed making process, as well as with a finished reed, crowing produces a multi-tone rattle or sound to give the oboist an idea of the overtones the reed is producing. Finally, below the bottom of the windows and above the top of the thread is a few millimeters of unscraped bark. The back of a reed refers to the cane between the bottom of the heart and the top of the thread.

There are many tools used in reed making that should also be defined. When tying a reed, the reed maker will need thread (I use nylon thread), a staple, a folded piece of gouged and shaped cane, a ruler marking out millimeters, a razor (for cutting the thread) and a mandrel. The mandrel will go into the tube of the staple, holding it in place securely and giving the reed maker something larger than the staple itself to hang onto. When scraping a reed, the reed maker will need a mandrel, a reed knife, a sharpening stone, a plaque, a cutting block, a razor (for clipping the reed), and a millimeter ruler. A reed knife is made for scraping reeds and should be relatively easy to sharpen. There are many different styles of reed knives with different blade shapes, including but not limited to double hollow ground, along with a variety of beveled shapes. There are a variety of sharpening stones used to keep the reed maker's knife sharp at all times. Certain reed knives require specific sharpening mechanisms. A plaque is small and made out of thin metal, wood, or plastic. It slides between the two blades of an opened reed and gives the knife something to work against during scraping. By using a simple single-edge razor blade and a cutting block, the reed maker can clip or shorten the length of a reed.

In Chapter One, I introduced my research study on oboe reed making, gave information on the purpose of the study, outlined my research question, discussed the importance of this study, and defined key terms. In Chapter Two, I will provide my review of literature related to this study.

CHAPTER II: REVIEW OF RELATED LITERATURE

In the previous chapter, Chapter One, I introduced this study about oboe reed making, discussed its overall importance, and provided some key information. In this chapter, Chapter Two, I will review the literature related to my study of oboe reeds and reed making. Many scholars agree that there is not one correct way to make a reed. I have organized my review of the literature into the following two sections: Oboe Reed Making Approaches and Oboe Reed Making Process and Variations. In the first section, I will discuss Oboe Reed Making Approaches, including different theories and ideas for approaching reed making. In the second section on the Oboe Reed Making Process and Variations, I will provide information from scholars who share various styles of making oboe reeds and variations on their methodologies.

Oboe Reed Making Approaches

In this section, I will present information from scholars who discuss the overall process of making oboe reeds (Berman, 1988; Ledet, 1961, 1981; Light, 1983; Rosandich, 2011; Salter, 2018; Schuring, 2009).

Oboe reed making scholars tend to disagree on the methodology of making reeds, yet they generally do agree on one main principle: reed making is a highly individualized and personal experience; therefore, a single correct method or theory of reed making does not and cannot exist. Jay Light, oboe performer and teacher, states at the very beginning of his book that there is no right or wrong way to make an oboe reed (1983). He asserts that every adjustment uniquely affects the balance and functionality of a reed as a whole; therefore, duplicating even a single reed making process would be impossible. Martin Schuring, collegiate music educator, adds to this idea by explaining that the alteration or scraping of one reed section will affect all the other sections by comparison (2009). He states, “You will seldom cure one problem without affecting another” (Schuring, 2009, p. 137). The interrelated quality of the oboe reed prevents there ever being a single, correct method of oboe reed making. David Ledet, oboe professor and academic, agrees that there is no one correct way to craft an oboe reed (1961). He factors in that each oboist is an individual with his or her own playing style and unique idea of what the oboe should sound like. Ann Rosandich, professional reed maker, points to the many different instruments and reed shapes that exist to explain why there is no single correct method of oboe reed making (2011). There are many variables within reed making even before the reed knife touches the cane. Melvin Berman, collegiate professor of oboe and performer, recognizes that there are many correct ways to make a reed; the sheer number of correct and workable methods must negate any thoughts of dogma when it comes to reed making (Berman, 1988). This is in part because every oboist is unique in their personal playing method, and their ideal reed’s characteristics are, by necessity, highly individualized. “Variations of embouchures caused by personal and physical characteristics such as teeth, jaws, lips, etc. will determine the reed which each oboist will finally settle upon. This is the reason that it is so necessary for the serious oboist to have the ability and skill to make and adjust his or her own reeds” (Berman, 1988, p. 42).

Oboe reed making scholars vary on the specifics of an ideal reed making timeline. Most scholars find that the overall process, from tying to the finishing scrape, should happen over the course of several days (Salter, 2018; Ledet, 1961; Schuring, 2009; Rosandich, 2011). These scholars observe that a reed can dramatically change characteristics from alternating periods of the cane soaking and drying out that happen each day. These observations have been incorporated into many of their reed making processes. Working on a reed over several days allows Schuring’s reeds to adapt to their new surroundings, such as temperature and humidity

(2009). In addition, each new day that the cane is soaked causes its textured fibers to raise to the outer surface. Ledet finds these same properties with the cane of his reeds, likening the experience to lumber drying out in the sun after being soaked: the grain of the wood rises to its surface, which can then be scraped or sanded off (1961). Similarly, he observes that soaking his reeds swells the fibers of the cane, which can then be scraped off, while drying shrinks the fibers back down. Rosandich describes this phenomenon a bit differently (2011). Incorporating stages of soaking and drying out her reeds allows the cane to change in a controlled environment before it naturally stabilizes on its own. Graham Salter, a widely experienced oboist and teacher in Britain, agrees that reed fibers swell and shrink over the course of several days; however, he goes on to say that this will cause even a finished reed to behave as if it's thickening or adding back cane that has been already scraped off (2018). In other words, a reed that has not gone through multiple cycles of soaking and drying out will gradually feel harder and harder to play on. Salter maintains that this happens because the swelling of a reed's fibers exposes inner air pockets, which then are deposited with saliva, causing the reed's cane to perceptibly thicken. It is therefore important for the reed making process to span several days in order to get past the initial swelling of the cane.

Light, too, observes reed cane's nature of expanding and contracting with multiple periods of soaking (1983). While most oboe scholars incorporate this into their reed making process as part of "breaking in" their reeds, Light takes an opposing view. He believes that the cane's raised fibers or resin actually lengthen the life of the reed. Soaking a working reed more than a couple of times gradually eliminates the presence of the resin and therefore shortens the life of the reed. A reed wears out when the resin or fibers of the cane gradually disappear; therefore, making a reed over the course of a few days will dramatically shorten its lifespan and should thus be avoided. Because of this, Light generally makes his reeds all in one sitting, from tying to the finishing scrape.

Because oboe reed making is so personalized, all elements of these scholars' reed making processes can fall into any number of philosophical spectrums. Most discussed among scholars are two general spectrums of reed making: exact versus relational measurements and sectional versus holistic methods of completion. While most scholars fall somewhere in the middle of these two spectrums, a few scholars adhere to the extreme opposites. In the first spectrum, Rosandich favors exact measurements (2011). Using millimeters, she measures the size and breadth of each reed section - even going so far as to pencil onto the reed mapped out boundaries of each section. She limits the degree of the "V's" angle by measuring its height. When an element of a reed, such as the blend area needs to be more drastically tapered, she accomplishes this by measuring the number of scrapes per millimeter. Her reed making process as a whole is also meticulously recorded day by day. Conversely, Schuring embodies less exact and more relational measurements (2009). He uses more generic words to describe his reed making process and favors symmetry and balance more than anything else. For example, the precise measurements of the height and angle of the "V" in millimeters do not matter as much to Schuring as the principles of consistency and symmetry. While Rosandich tapers the blend by counting the number of scrapes within each millimeter, Schuring describes tapering as simply overlapping many short scrapes. Schuring's entire reed making process, though divided specifically into three days, has the generic goals of thinning out after the first day, crowing after the second day, and more or less playing like a finished reed after the third day.

In the second spectrum of sectional versus holistic methods of completion, Light embodies the sectional method. His reed making process requires the division of each reed into three sections - tip, hump, and back - scraping each section into what it should look like on the final reed before moving on to a different section. Rosandich, on the other hand, instructs the following philosophy of her reed making process: “Do not finish one area of the reed in isolation” (2011, p. 59). While she meticulously distinguishes and defines each day of her reed making process, she follows a more holistic approach in completing her reeds by freely moving from one section to another in her various scraping stages. Both Light and Rosandich create good quality reeds that function well, but the methods they follow in order to achieve this differ from each other significantly.

Oboe Reed Making Process and Variations

Oboe reed making scholars agree on these three main steps of reed making: tying, construction scraping, and adjusting scraping (Berman, 1988; Hedrick & Hedrick, 1972; Light, 1983; Mayer & Rohner, 1953; Weber & Capps, 1990).

Tying

This subsection discusses literature concerning the first step in the reed making process: tying oboe reeds. David Weber, professional reed maker, and Ferald Capps, professional performer, find tying to be the crucial foundation to every good reed. “The importance of a smooth, uninterrupted flow of vibrations through the tube and into the oboe cannot be overstated…it needs to be understood that the cane must be placed upon the tube straight, so that the reed becomes an extension of the bore of the oboe” (Weber & Capps, 1990, p. 51).

Before any tying can begin, reed making scholars find their initial step to be preparation. After soaking the cane in warm water for twenty to forty minutes, Weber and Capps begin their tying process by first scraping four millimeters of bark from each end of the folded piece of cane for a tapering effect, which helps the cane more seamlessly become an extension of the staple's tube. This is a unique step only found in the Weber and Capps literature. Also unique to these scholars is the idea of beginning the overlap before ever placing the cane onto a tube. An overlap in a reed means that, rather than having the sides of each blade simply press against the sides of the other blade in order to seal, the sides of each blade interlock inside the other blade. For right-handed reed makers, the front blade is slightly pushed to the right and the back blade is slightly pushed to the left. For left-handed reed makers, this gets reversed. The blades are pressed together in this shape, encouraging them to return to this desired overlap position when later engaging in the tying process. Finally, Weber and Capps measure the length of the staple and remember this measurement. When compared to the literature of Robert Mayer, professional performer and professor, and Traugott Rohner, professor, editor, and author, Weber and Capps' process is more detailed. The literature of Mayer and Rohner is more step-based and focuses on other elements of reed tying (1953). While they do not give specific instructions for the preparatory soaking of the cane, they do emphasize that the tube or staple should be pushed firmly into the mandrel in order to ensure the two pieces stay together through the tying process. Mayer and Rohner pay special attention to the length of the staple as well, going a step further than Weber and Capps by marking the cane in pencil to show where the end of the tube is.

Tying is a process in which many variables need to be controlled. While both Weber and Capps, and Mayer and Rohner emphasize the importance of a tight wrap, take special care not to wind past the end of the tube, and coat the thread in beeswax, there are some key differences. Mayer and Rohner keep the thread taut at all times, only relaxing it when a change needs to be made (1953). Their main focus is to have both sides of the reed closed at equal amounts on each side by the time the thread reaches the pencil mark, signifying the top of the tube. If there is difficulty in accomplishing this task, they reposition the cane a bit farther down on the tube before trying again. Weber and Capps, on the other hand, have several more variables that need to be controlled (1990). Though Mayer and Rohner briefly mention that cane needs to be placed straight onto the tube, Weber and Capps specify this into lateral (side to side) and vertical (front to back) straightness. In addition, they overlap the blades in order to prevent any possible slipping between them. Weber and Capps also utilize the guide thread to ensure each wrap is snugly next to the previous one. The last major difference is that Mayer and Rohner keep the thread taut during the entire tying process, while Weber and Capps do the first few wraps loosely before gradually tightening the thread.

Construction Scraping

This subsection reviews key literature about the initial scraping of reed blanks, constructing them into the sections of a sound-making reed. Generally agreed among reed making scholars, the purpose of these early scraping stages is to gradually thin the cane, allowing it to vibrate when played, as well as begin to define the separate areas or structures of a finished reed. This can be paradoxical, as defining reed sections can in fact disrupt the reed’s ability to vibrate. Berman summarizes, “Although the separate areas of the reed…must be very well defined and readily visible through the light, it is best to terrace or blend the sections smoothly into one another rather than having each individual section end abruptly and another begin” (1988, p. 23).

Day One of Berman’s constructing stage focuses on blending the different areas of the reed. He views the reed blank in two separate areas: the tip (which includes some of the heart) and the back. He begins the scraping process by creating an inverted “U” shape at the tip. Berman gives a detailed description of this as scraping five millimeters back from the end of the reed at the center and ten millimeters back from the end of the reed at the sides. Berman prefers this rounder shape to an inverted “V” in order to avoid harsh angular scraping. During this process, it is crucial that both sides of the reed are scraped equally. After sufficiently thinning the tip, Berman extends the shape into the back of the reed by doing long scrapes in another “V” shape. The heart of the reed will be at the “V’s” widest point where the least amount of cane is scraped away. This method allows for the simultaneous defining and blending of sections, for the sides of the heart blend more into the tip, while the center of the heart maintains its five-millimeter division from the tip. Berman then carefully scrapes the upper layer of bark off the reed’s spine and leaves thin edges of bark up the sides as rails. His next adjustment is to clip open the tip so that the cane measures approximately twenty-three to twenty-four millimeters. The tip should be thin enough at the end of this first stage for the crow to sound. The sound the crow makes should direct the reed maker on what adjustments are needed, but he is careful to note that crows can sometimes be misleading. Berman then tries the reed in the oboe. After thinning the tip a bit more and cleaning up any lack in symmetry, the reed is set aside and dried overnight. At this point, the different sections of the reed have been introduced but not defined.

Day Two of Berman’s constructing stage defines the different reed sections from one another. He emphasizes that the reed must be soaked in hot water for ten minutes before any scraping can be done. Berman begins Day Two of the construction stage by further thinning the tip and clearly defining the “U” shape so that it is easily visible. Next, he equally removes more cane from each side of the reed so that front and back are equal, as well as the right and left sides of each. He emphasizes the work done on Day One by also defining the windows from the rails and spine. Berman often examines the reed's profile, an example of which can be seen in *Figure 2.1*.

Figure 2.1

Profile View of a Reed

Note. Original drawing by the author

In examining the profile views of his reeds, Berman looks for general thick to thin tapers from both the bottom of the cane to the tip and the center of the blade to its edges. After crowing and trying the reed in the oboe, Berman will again set aside the reed and let it dry overnight.

The Day One goal for Weber and Capps' construction scraping, "is to remove enough cane so that the tip can be cut open without cracking the reed and to establish a basic method of scraping to be used throughout the entire reed making process" (1990, p. 61). Unlike Berman, they do not scrape enough on Day One to make a crow possible. Weber and Capps do agree with Berman that the reed blank should initially be viewed into tip and back sections; however, they define these sections differently. While Berman uses the "V" to separate the tip and back sections, Weber and Capps divide the reed in perfect halves, meaning that a significant portion of the heart is included in the tip section. Weber and Capps use the “5-4-3-2-1” method to begin tapering the tip. The first scrape begins about one-third of the way down the cane portion of the reed and follows through to the end of the tip. Each scrape afterwards begins slightly closer to the end of the tip, but they all follow through to the end, creating a tapering effect from bottom to top. The tip can be clipped once thin enough. Weber and Capps mention that the center thickness of the reed disappears with this practice but will be re-established on Day Two. Once the tip is clipped open and the overlap is snapped into place (altered after tying), Weber and Capps set the reed aside to dry out overnight. While Berman’s Day One thins the entire reed as a whole and neglects to mention the overlap, Weber and Capps’ Day One leaves the back two-thirds of the reed untouched and does emphasize the overlap.

Day Two of Weber and Capps’ constructing stage is based entirely on dogmatically listening to the pitch of the crow and scraping in response. This is done by alternating between thinning and clipping the tip and gradually lengthening the scraped area to cover the entire reed. About halfway down the scraped tip area from Day One, a series of slanted scrapes gradually tapers the blend area. The degree of slant gradually increases from 10 degrees to 30 degrees. A slanted version of the “5-4-3-2-1” method is then used to define the tip, with the bottom-most scrape creating the inverted “V” shape. It should be noted that Weber and Capps uniquely view the blend area as the bottom of the tip, making the actual area of the thinned tip itself quite small. Once the crow loses its high and shrill overtones, the scrape can move back into the heart. Once the crow becomes a low and easy pitch, the tip gets clipped until the pitch of the crow reaches a “C.” The scraping then moves into the back of the reed. This often necessitates alternating with thinning and clipping of the tip until the crow signifies easy vibrations. Weber and Capps will not move on to the Adjusting stage until this criterion is met. The crow must also maintain a “C” pitch and the tone quality must be satisfactory to the reed maker before the reed is set aside to dry.

Adjusting Scraping

This subsection discusses literature concerning the final adjusting stage of oboe reed making. According to Light, a reed is ready for the adjusting stage of scraping when the various structural elements have been clearly defined and the crow is easy to play and in tune. Once the reed has been set aside and properly dried out from the previous construction stage, Light expects that it will have changed when beginning the adjusting stage. This stage is all about testing the reed and making slight adjustments based on the results of these tests. The most telling test is the crow; it gives the reed maker information about the strength and pitch of the reed. His goal is for the crow to sound three octave "C's." Light will clip the reed next in order to test the thickness of the tip, to give the tip a clean and linear end, and to bring up the reed's pitch. Another element of adjusting unique to Light is the overlap of the blades. If the overlap has gone further than desired, Light will trim off the excess sides, which he claims raises the pitch of the reed and improves stability. With the expected changes in the reed since the previous stage of scraping, the blend area often needs to be touched up in the adjusting stage. "What you're trying to do," Light says, "is eliminate any bumps, particularly those encountered at the corners of the hump or heart where they meet the tip" (1983, p. 83). He creates a slope from blend to tip, mainly at the center of the reed, so that these two areas work together in harmony to free up the crow and lower the pitch, if necessary. Light uses another test that is not mentioned by any other scholar: he loosens his embouchure to slide the reed around in his mouth while blowing forte. Air around the reed should be escaping if executed correctly. This is to test the reed's vibration threshold, for it should never stop vibrating during this test. Lastly, Light's final step in the adjusting stage is clipping a tiny amount off the corners of the tip. He claims that, because this prevents the tip section of the blades from touching each other, the response time will improve. Light also mentions that the adjusting stage is most beneficial when the reed maker can do the adjusting in the location of the next performance. This will significantly lessen the role that environment - humidity and temperature - will have on the reed's development and eventual settling.

While Light's ideal profile for a finished reed is a long taper, the ideal taper in a reed made by Peter Hedrick, collegiate professor, and Elizabeth Hedrick, an oboe performer, is a slight bumping out of the heart area. Like Light, Hedrick and Hedrick find that the heart and blend areas that transition the back of the reed into the tip are the most important factors in controlling the strength of a reed. Hedrick and Hedrick's adjusting stage generally begins by further refining, defining, and blending of the heart into the tip until the reed vibrates easily. While they do mention the ideal of balance, Hedrick and Hedrick do not specifically discuss adjusting any other section of the reed; however, to achieve balance between the reed sections, the need might arise for other sections to be adjusted. While Light has a few tests to determine the characteristics of his reeds, Hedrick and Hedrick mainly rely on the crow. Unlike Light, Hedrick and Hedrick list twelve possible problem behaviors of a reed and describe how to go about fixing them. These common problems span from air leaking between the blades to an unfavorable tone quality. To summarize their explained solutions, Hedrick and Hedrick will often target a certain section to scrape. Sometimes, though, they will restructure the entire reed by moving the heart back or shortening the area itself. This is quite different from Light, who instead mainly adheres to the structures put in place from the constructing stage when making adjustments. Hedrick and Hedrick’s solutions are not as creative as Light’s. Also in their case, bad quality cane is the culprit for many potential problems, while Light hardly mentions this factor.

In conclusion, Chapter Two examines the various opinions, methods, and observations from many oboe reed making scholars on the three stages of reed making: tying, construction scraping, and adjustment scraping. To better understand how the role of reed making can help oboe students improve in their playing, it is important to research a variety of reed making aspects from many different scholars in order to discover the role that reed making can have in the playing careers of high school students. The literature included here forms the foundation of this research because it helps to better examine my research question: how can reed making and reed choice help student oboists be more successful?

In this chapter, Chapter Two, I reviewed the literature related to this research study focused on reed making. In the next chapter, Chapter Three, I will describe the methodology and design of my study that addresses my research question, as well as the procedures I used in analyzing the data.

CHAPTER III: DESIGN AND METHODOLOGY

Last chapter, I reviewed a sample of pre-existing literature about oboe reed making approaches and oboe reed making processes and variations. In Chapter Three, I will now explain how I designed this research project and share my methods of analysis. I have created the following subsections for the ease and understanding of the reader: Process, Participants, Qualitative Research, Data Collection and Analysis. As I noted in Chapter One, the research question driving this study is as follows: how can reed making and reed choice help student oboists be more successful?

Process

My process for conducting this research began with trying to understand how reed making can aid student oboists in learning how to play the oboe. I knew I wanted to make a variety of reeds for various student oboists to try, critique, and ultimately use in their performances and practicing. I also wanted the students to select the reed that felt and sounded the best to them. I reached out via email to sixteen band directors of local area public high schools explaining my project and inquiring if they had any student oboists that would like to participate. Two band directors communicated back with a total of four student oboists that were willing and able to participate in my project. These four students had a parent sign the Parent Permission Letter (see *Appendix A*). I met with each student twice and took notes on both the reed selection process and the unique reed needs of each student for analysis. I began the first meetings with a common series of questions for each student to answer in order that I may gain a better understanding of their history playing the oboe.

Participants

My participants were selected using convenience sampling. This kind of sampling identifies participants according to predefined criteria. According to Robert Friis and Michael Chernick, convenience samples represent the population from which they came, meaning "...they mirror the underlying characteristics of the population from which they were selected" (2003, pp. 25-26). Another common characteristic of convenience sampling that was helpful for the purposes of this study is the use of description within the data. Because I was trying to understand how reed making can help student oboists be more successful, I used this type of sampling typical for my qualitative research (Johnson et al., 2020, p. 141). In order to help answer questions about reed making in relation to the success of student oboists, I needed to work with high school-age students from public schools who did not have a private oboe teacher, where individualized attention to the student musician may not come so readily. Once these details were confirmed, my pool to select from seemed rather small, and I selected four high school students from local area public high schools. I reached out first to the band directors of these students, who either put me in contact with the students over email or oversaw the scheduling of my meetings. After the students received a Parent Permission Letter form (see *Appendix A*) they consented to participating in my reed evaluation meetings. It should be noted that all four participants were female. While there are male oboists that I am sure fit my criterion, all of my participants happened to be female.

Qualitative Research

This study uses Qualitative Research, which can be defined as research that largely uses and analyzes empirical data as it relates to a research question that often focuses on some aspect of the human experience. Jessica Johnson, Donna Adkins, and Sheila Chauvin state, "A research question must be clear and focused and supported by a strong conceptual framework, both of which contribute to the selection of appropriate research methods that enhance trustworthiness and minimize researcher bias inherent in qualitative methodologies. Qualitative data collection and analyses are often modified through an iterative approach to answering the research question" (2020, p. 138). By using qualitative research, I was able to collect data from my reed making, my observations of high school students in their evaluations of my reeds, and the observations of the students. Conducting a qualitative study allowed for me to focus not only on each student's observations of the sound and feel of a reed, but by my own observations, too, as both an objective listener and reed maker. I was able to collect data first by keeping an inventory of the reeds I had made. Each reed had unique characteristics of response, intonation, and tone. Then, I was able to collect data from the students regarding the sound and feel of each reed that they tried. This data collection was an ongoing process that continued until each student was satisfied with their reed.

Data Collection

My data collection process consisted of meeting with each student twice and taking notes on both the reed selection process and the unique reed needs of each student for analysis. I began the first meetings with a common series of questions for each student to answer in order that I may gain a better understanding of their history playing the oboe (see *Appendix B*). I asked each student what grade they were in, when they started playing the oboe, if they transitioned to the oboe from another instrument, why they chose to play the oboe, and what they liked about the oboe. I also asked a common series of questions about the reeds of each student: what their biggest struggle was with playing the oboe, what they liked and disliked about their reeds now, and what an ideal reed would allow them to do. Then, knowing the characteristics of each reed in my inventory, I selected one for the student to try that would be the best fit.

I had each student warm up on the reed for 2-3 minutes according to a Reed Evaluation Form (see *Appendix B*) that I created. Each student was to begin by slowly playing a few scales in whole notes - low register to high register and back down to the low register. Next, each student played a few scales at their normal speed - slurring some sections and tonguing others, in order to add articulation. Depending on each student’s ability, warm-up would either stop here or end with a few wide intervals from the more extreme ranges of the instrument. It should be noted that this warm-up process would stop any time the reed was insurmountably a bad fit for the student, and it would begin again with the student trying a different reed.

After warming up on a reed that would potentially work for each student, I asked them to critique the reed according to certain characteristics: responsiveness (all registers), pitch, and tone. As an oboist myself, I could often hear when a student was struggling with a certain aspect of the reed; however, I restricted myself to adjusting the reed only from their direction and descriptions. After adjusting the reeds to each student’s satisfaction, the first meetings were concluded. I instructed the students to play on the reed in rehearsals and practice until our next meeting.

The second meeting with each of the students happened one week later (except for one student, who was sick and requested to meet two weeks after the initial meeting). These meetings began with a different common set of questions meant to evaluate the reed after it had been used for one (or two) weeks. I asked each student how the reed had been playing, if they had noticed any changes in the reed from the way it was at the end of our initial meeting, and how I could make the reed a better fit for them. Based on the direction of the students, I made some final adjustments until they were satisfied with the finished reed.

Approach to Analysis

I took detailed notes during the meetings of each student for three different purposes: to record what was happening in real time in terms of the performance and analysis of the reeds, to observe the natural playing tendencies of each student, and to record each student's response to a common set of questions. It was imperative for this research study to isolate the reed's performance from the limitations or tendencies that each student's playing could exert upon the reed. In other words, I needed to limit to the best of my ability all outside factors apart from the reed's performance itself.

My main goal in note-taking was to record the events as they unfolded from each reed meeting. To do this, I used the Reed Evaluation Form that I created for each student so that they would each evaluate their reeds using the same criteria (see *Appendix B*). These criteria included responsiveness, pitch, tone, and focus.

This evaluation sheet allowed me to learn much about each student's musical and oboe playing history. I learned which students began on a musical instrument other than an oboe and which students did not. I learned how long each student had been playing the oboe, as well as each student's high school grade level or approximate age. This helped me form an accurate estimation of each student's proficiency level playing the oboe before ever hearing them play. Included in this were questions about each student's natural playing tendencies, greatest difficulties with playing the oboe, biggest struggles with reeds, and characteristics of an ideal reed.

For this research project to be well-rounded, I needed to listen to the viewpoints and opinions of each high school student, yet I also needed to rely on my own observations in order to get a full picture of each student's ability on the oboe. My visual observations of each student mainly centered on posture and embouchure. For example, if one student's posture was not conducive to good oboe playing, I knew that their reed performance and evaluation of said reed performance would in some way be affected by this. My aural observations generally aligned with those of each student, though I often had to help the students expound on their evaluations of my reeds.

I took a majority of my notes directly after each meeting, where I reflected on the experience as a whole, oftentimes adding more details or reporting outcomes that were both expected and unexpected. I collected the data called for from the common set of questions in the evaluation form, as well as from my own observations and recorded it in my note taking. While Chapter Three describes the design of my research project, as well as my method of analyzing the collected data, Chapter Four will share the results of this data.

CHAPTER IV: FINDINGS

In the three previous chapters, I introduced this study about oboe reed making, reviewed literature related to the study, and described the methodology and my approach to analysis. In this chapter, I will share my findings from the data. As described in Chapter Three, I created a research study with the goal of determining how oboe reed making can aid high school student oboists in transforming their playing. To accomplish this, I collected data by cataloging my inventory of handmade reeds, learning about each student's oboe playing history, and observing each student's playing tendencies. The results of this data collection will be discussed in this chapter.

The Role of Reed Maker

Longer Reeds

In preparation for the reed meetings with each of my four high school participants, I made an initial batch of five reeds. The entire reed making process for this batch, from tying to final adjusting scraping, spanned three days. The thread of these reeds all differed in color so that I would be able to tell them apart from one another. These colors were red, turquoise, black, white, and purple. As blanks, these five reeds were tied at an average length of 73-74 millimeters. As finished reeds, they measured an average length of 70-71 millimeters. These finished reeds also had a tip that measured three to four millimeters tall. The construction of these longer reeds favored a tip and windows that were thin throughout and a blend area that did little to taper from tip to heart (see *Figure 4.1*). *Figure 4.1* and *Figure 4.2* are sketched as if lights were shining through the reeds from behind. The darker the color, the thicker the area of the reed; the lighter the color, the thinner the area of the reed.

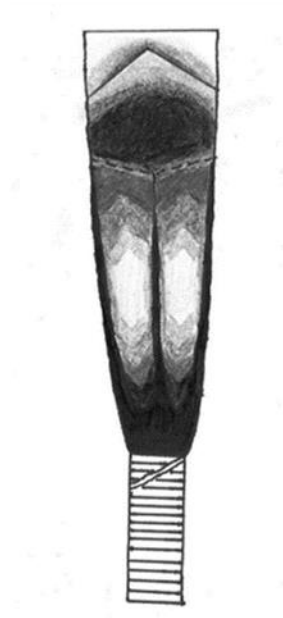
Figure 4.1

Backlit Reed from First Batch

Note. Original drawings by the author

Figure 4.2

Backlit Reed from Second Batch



Note. Original drawings by the author

At the end of the constructing scrape stage, all of these reeds tuned flat by about fifteen or twenty cents. During the adjusting scrapes, I was able to slightly bring up the pitches of the reeds by both clipping the reed and further defining the “V” to be on average about only five or ten cents flat. However, these tuning adjustments made the strength of the reeds harder. The profile views of each of these five reeds showed that the windows below the heart were quite thin in structure, meaning that more cane was taken out of the entire backs of the reeds in an effort to ease the strength of the reed. All of the reeds were symmetrical in structure except for the purple reed, in which one side of the profile view wholly tapered from thread to tip, while the other had the aforementioned structurally thin back. The tips of four of the reeds maintained their integrity; however, the purple reed had some minor chunks of cane taken out of the sides of the tip. I tested the reeds before the reed meetings. All five of these reeds sounded and felt muted, as if they were not vibrating enough to get a full sound. This was especially true for the red and white reeds. The white reed also needed to be soaked longer than the rest for it to have a wide enough opening.

Shorter Reeds

One week after completing the first batch of reeds, I created a second batch consisting of four reeds in order to give the high school students a wider variety to choose from. The entire reed making process for this second batch of reeds spanned four days. These four reeds had different colored thread from each other, as well as from the initial batch. The colors in this batch were blue, gold, green, and orange. These reeds were all tied at 70-71 millimeters in length. The finished reeds measured 68-70 millimeters in length. The tips of these shorter reeds were smaller than the tips of the longer reeds, measuring around two millimeters tall. When compared to my first batch of reeds, the reeds from the second batch had thicker windows, made especially evident when taking a profile view of the reeds. The tips of these reeds were not as thin throughout, instead tapering into the blend and heart. These shorter reeds were intentionally less finished going into the reed meetings so that I could do more of the adjusting scrape at the students' direction (see *Figure 4.2*).

The results of the finished reeds after the four-day reed making process had more variety than the results from the first batch. In general, these four reeds all vibrated more freely than the first batch of reeds. The profile views of these reeds showed that less cane was scraped off of the reed's back than it was with the longer reeds. These four reeds were also more in-tune than the first batch – initially tuning only five or ten cents flat. I tested the reeds before the reed meetings and will describe them here. The blue reed initially tuned about five or ten cents flat, but it had an easier strength than that of the longer reeds. The gold reed was in-tune, and it vibrated freely; however, a tiny chunk was missing out of the side of the tip. The green reed had an all-encompassing taper in its profile view more than any other reed, and the very tiny left-side corners of each side's tip were missing. The orange reed was generally in-tune but had a slightly thinner back than that of the green reed.

The Role of Listener

This research project required me to take on the role of listener in more than one way. First, I listened to the words of each student as they described in their own words their oboe playing history, their playing tendencies, and the characteristics of an ideal reed. After the students tested my reeds, I next listened to their evaluations of them, along with their direction as to how I could best adjust them. This was guided by the evaluation sheet in order to promote consistency across each of my reed meetings. Throughout each reed meeting, I also observed and listened to each student's playing as a fellow oboist, noting each student's playing tendencies, as well as areas of strengths and weaknesses. The data I learned from my various listening roles has been recorded in the following paragraphs. It should be noted that I will be referring to the students by pseudonym.

First Meeting with Students

Rachel. Rachel was a tenth-grade student. She started out playing the oboe and had been playing for three or four years. Her playing style emanated good control over the reed and instrument, yet she also did not play using her full sound or dynamics. She mentioned that she also had a slight tendency to play sharp and that the most difficult aspect of playing for her was moving her fingers. An advanced player, Rachel's ideal quality in her reeds was a dark tone. Her playing posture featured a slight curve to her spine and downward tilt of her chin, and she crossed her legs while playing during most of the reed meeting. I also observed that Rachel did not soak her reed in water, nor did she devote much time “soaking” the reed in her mouth before playing on it.

First, I had Rachel try the purple reed. It was too hard for her to play on, so I thinned the outer corners of the tip, further tapered the blend into the tip, and removed a little more cane in the back, heart, and tip of the reed. The purple reed was still too hard, though it had good tuning. Next, I had Rachel try the white reed. Again, the intonation was good. The strength and response of the reed was also fairly good. Rachel struggled to get the low notes to sound, so I tapered the bottom of the heart into the windows, which fixed the problem. After Rachel played on the white reed a bit more, she declared that she was happy with it as is. She liked the smooth and round tone of the white reed. The tip of the white reed was more closed than the others, so I heavily suggested she soak her reeds before playing on them.

Sarah. Sarah was an eleventh-grade student. She had started out playing the clarinet in sixth grade but switched to the oboe in eighth grade, giving her three years’ experience as an oboist. Sarah’s playing posture was generally good with a very slight tucking of her chin from time to time. Her embouchure contained a lot of biting pressure, and her intonation varied greatly in both the sharp and flat directions. She was a more beginner to intermediate-level player. It should be noted that her instrument needed fixing. Certain mechanisms of the instrument were not working properly, and certain notes would not speak because the instrument was in need of repairs. Sarah’s ideal quality of a reed was intonation. She also liked the unique sound that the oboe produces.

Sarah began by trying the gold reed. It was very flat, so I made a couple of adjustments. I further defined the V shape at the bottom of the tip. I also thinned the corners of the tip before clipping the reed. The gold reed still played very flat, so I repeated the process of thinning and clipping the tip three more times. Each time, the gold reed maintained its flat intonation. Next, I had Sarah try the red reed. This reed generally played in-tune, but the strength of the reed was a bit too hard, so I scraped a little off the top of the heart, tapered the blend into the tip, and smoothed the reed as a whole. I had her try the reed after making these adjustments. Sarah tried the reed and required the same adjustment two more times before the problem was sufficiently solved. Sarah had some difficulty getting the low notes out, so I tapered the windows into the heart. After this, Sarah was happy with the final outcome of her reed. She said the red reed had better responsiveness and a prettier tone than that of her other reeds.

Elizabeth. Elizabeth was a tenth-grade student who started out playing the oboe and had been playing for four years. She had excellent posture when playing the oboe. Elizabeth was at a beginner level; she had to look up some fingerings for the more extreme high and low ranged notes. An ideal reed quality for Elizabeth was to have an easier time playing the extremes of the range. Her high notes had a trembling quality to them, suggesting an overbearing embouchure, and she in general struggled to control her tone, especially with the high and low notes. The low notes especially were reluctant to speak, and Elizabeth would often adjust the upper and middle joints of her instrument in order to seemingly and temporarily fix the problem. Elizabeth was the only student who crowed her reeds before putting them in her instrument.

I had Elizabeth try the black reed. The intonation was flat, the strength was too hard, and the extremes of her range were difficult to play. I addressed the strength of the reed first by scraping the outer corners of the tip, tapering the blend into the tip, and minimally dusting a bit off from the heart. When Elizabeth was satisfied with the improvement, I addressed the intonation. After easing the strength of the reed, I noticed that it was more in-tune than before, though still a bit flat. Because of this, I further thinned the outer corners and very end of the tip before making a very thin clip. Adjustments ceased once the reed was in-tune and once Elizabeth was comfortable with the strength of the reed and its responsiveness.

Anne. Anne was a twelfth-grade student who had been playing the oboe for six years. She started out playing the oboe and was at a good intermediate level of playing. Her posture was slightly hunched, and her playing was initially a half-step flat, though with a great tone. Anne enjoyed the smooth and round sound that good reeds could provide. Response and ease of range were important to her in an ideal reed.

Anne tried the orange reed first. The strength was too hard to play on, even after I tried adjusting for it by taking more cane off throughout and thinning the tip and its outer corners. Then, Anne switched to the turquoise reed, which I deemed the best remaining reed out of the first batch. I thinned the outer corners of the tip to improve response, and then scraped more of a taper from heart to windows. The tone of the reed was beautiful, but the intonation was still a half-step flat. The rest of the reed meeting, I attempted to raise the pitch of the reed by further defining the V, as well as minimally thinning the end of the tip and clipping it. There was little improvement to the intonation, so I was hesitant to make too many adjustments to the reed. I knew from playing on the turquoise reed myself that its intonation was not nearly as flat as it was sounding when Anne played on it. It was a combination of this and running out of time that we ended our first reed meeting.

Before leaving Anne’s venue after the initial reed meetings were concluded, I decided to give her an additional reed. Her initial reed meeting was the only one where the issues brought forth by the student weren’t fixed through any of my reed making adjustments. I selected the blue reed, as it was one of the reeds from the second batch which were tied shorter and would therefore be naturally sharper. I tried to bring up the pitch on it as much as I could without making the strength too hard for her to play on. I focused on really defining the “V,” thinning the tip, and clipping it before the strength got too hard. Since Anne was no longer present, I tried the blue reed between adjustments until it made my playing five cents sharp while still being at a very easy strength for me to play on. The band student teacher delivered the finished blue reed to Anne later that day.

Second Meeting with Students

Rachel. This final reed meeting was different than that of the other three students. For five days, Rachel had played on the white reed I had given her from our first reed meeting. On the sixth day, however, a few days away from our final reed meeting, the white reed had broken. It had gotten more closed than it had been the week before, and Rachel had squeezed the sides of the tip in an attempt to open up the reed, causing it to snap. Although the white reed did not survive through the entirety of the research project, I suspected that, despite my strong suggestion for Rachel to soak her reeds, she had opted not to, compounding on the reed’s already natural tendency to be closed.

Rachel’s final reed meeting would be much like her first. To begin, I had her try the green reed, which was very hard for her to play on and flat. I thinned the tip and dusted over the heart to ease the strength of the reed, and I further refined the “V,” as well as clipped a tiny amount from the reed to raise the pitch. Neither of these adjustments made much of a difference, so we moved on the orange reed. This reed had good intonation, but it was a bit too hard to play on. The high notes were also difficult to hit and had an airy quality to them. I adjusted for both of these issues by thinning the sides and outer corners of the tip, as well as dusting over the existing taper of the blend area. These adjustments only had to be made twice before Rachel was comfortable with the feeling and sound of the reed. She especially liked its round and dark tonality.

Sarah. Due to unforeseen circumstances involving sickness, Sarah's final reed meeting was held two weeks after the first. She reported that the red reed had seemed to be broken in, as it was easier to play on than it had been before. She also commented that it produced a less rough and smoother tone that it had two weeks prior. Sarah did note, however, that she found she needed to soak the red reed before playing on it, as it otherwise got too dry to function without. The pitch of the reed had raised about a half-step in the two weeks between meetings, though her intonation still fluctuated across the range of the instrument. It was unusual that the reed's strength did not get harder when its intonation got sharper. Upon playing the reed in her instrument, Sarah at first had difficulties getting a sound to come out. Both she and I observed, however, that this same phenomenon happened with any reed she played on. It was due to her instrument that needed fixing that these initial responses of sound were hindered. In order to lower the pitch of the reed, I scraped a bit of cane off from the top of the heart, where it transitioned into the blend or tip and the bottom of the heart, where it transitioned down into the windows. This single handedly brought down the pitch and improved the reed's response as well. Finally, I smoothed out a few nicks in the reed to give it a more all-encompassing finished quality.

Elizabeth. This final reed making meeting began with Elizabeth telling me how her black reed had drastically changed in the week since our first reed meeting. She explained that the pitch of the reed had actually gotten a bit sharper over the course of the week. Though the reed was still naturally five cents flat at this point, it was much closer to being in tune than it had been at our first reed meeting. Elizabeth also described that the reed had gotten much easier to play on, to the point that the strength had become too easy. To combat this, I further defined the “V” in an effort to decrease the quantity of vibrations through the back of the reed, which would bring up the pitch. Upon trying the reed, Elizabeth noted that it was playing much flatter than before. I also observed that she was struggling to get the low notes to respond. Elizabeth had struggled with the low notes in our first reed meeting when she played on one of her own reeds, so I began to suspect at this point that her instrument was not properly sealing. Keeping this in mind, I scraped the transition from heart to windows for two reasons. First, I wanted to create the minor semblance of another “V” between the heart and back of the reed in order to decrease vibrations, which would both raise the pitch and make the strength of the reed a bit harder. Second, I wanted to scrape a bit of cane away from the back of the reed, which would aid in the response of the low notes. This adjustment did raise the pitch and strengthen the reed; however, the response of the low notes was only marginally improved. Knowing how the reed had played for me and remembering back to our first reed meeting, I determined that Elizabeth’s struggle with her low notes was most likely due to a malfunctioning instrument, though I was able to slightly improve upon this problem by scraping the back of the reed. I played on her instrument with one of my own reeds and successfully confirmed my malfunctioning instrument theory.

Anne. I began our final reed meeting by asking how both of the reeds I had given her were working out. Anne replied that the turquoise reed had grown very hard to play on and increasingly flat. The blue reed had exhibited the same changes, though they were not as drastic. I had Anne play on both reeds so that I could observe their changes for myself. Expecting her intonation to be a half-step flat as it was in the first reed meeting, I was shocked when she played much more in-tune, though still flat, with both reeds. I was confident that it wasn’t from any changes in the reeds that Anne’s initial flat intonation had been altered to such a wide degree, for the reeds had not played dramatically flat for me when I had tried them. Most likely, this meant that some other variable had been at play that I wasn't aware of during our first reed meeting. Upon further reflection, I remembered that Anne had come directly from a Solo & Ensemble rehearsal when she had arrived for our first reed meeting. Though she hadn't said it at the time, nor had she given any indication of it, Anne was most likely playing much more than she was used to. Because of this, her embouchure was probably exhausted, leading to a flat intonation for the entirety of our first reed meeting.

Upon beginning our final reed meeting, Anne found more potential in the blue reed, so I addressed this one first. I further sloped the blend area between the heart and tip in order to increase vibrations, making the reed's strength a bit easier. I then addressed the pitch, which had grown marginally flatter after my first adjustment. While I increased the vibrations of the reed through the tip and into the heart by working on the blend, I slightly decreased the amount of vibrations by defining the "V" in order to make less of the reed vibrate, therefore bringing up the pitch. I only made a tiny clip in order to avoid negatively affecting the strength of the reed. After making these adjustments, both the strength and intonation of the reed were fixed for Anne.

We also had time to address the turquoise reed. I repeated my actions with the blue reed and further tapered the blend between the tip and the heart in order to increase vibrations, making the reed easier to play on. Because the turquoise reed was much flatter and much harder than the blue reed had been, I focused my attention on clipping the tip, which would shorten the reed and bring up the pitch. In order to prevent the reed from once again growing too hard to play on, I thinned the corners of the tip before each clip. These adjustments of clipping and thinning the tip had to be repeated two more times before the reed was comfortable for Anne to play on, as well as in-tune.

Concluding Thoughts

The results of my research study can be summarized as follows: two high school oboe students (Sarah and Rachel) favored the longer reeds of the first batch, while the other two students (Elizabeth and Anne) favored the shorter reeds of the second batch. At the end of each of my final reed meetings with the students, the reeds they had selected after my adjustments were all similar in structure and could be characterized as a combination of my first and second batch of reeds. These final reeds measured 69-70 millimeters in length like the second batch; however, the lengths of the tips between the two batches measured at two to three millimeters. These finished reeds resembled my first batch of reeds in that the major reed structures, (tip, heart, and windows) had been scraped more and were further developed after the two meetings of adjusting scraping than they had been before the reed meetings. However, the finished reeds selected by the high school students more closely resembled my second batch of reeds in that the transition areas of the blend and catch were well defined and functional. It is important to note that the windows of the selected reeds also embodied this idea of transition, for the center of the windows was thinnest, while above and below tapered into the neighboring sections. While I attempted in my first batch of reeds to make them easier to play on by further scraping the tip, heart, and windows, I utilized the blend and catch areas to accomplish this both in my second batch and in the final adjustments made to the reeds that were selected.

In this research study, I found that these high school students required oboe reeds that were not too difficult to play on. They needed reeds that encouraged rather than inhibited the vibrations through the cane, yet they also needed reeds that could bring up and maintain good intonation. The best way that I found to create reeds that were in-tune and easy enough for high school oboists to play on, was to give special care to the transitional sections of the reed, rather than making too many adjustments on the main structural elements.

In this chapter, I shared the data which I collected from my research project. I not only recorded the events of each reed meeting, but I also took notes on each student's oboe playing history, listened to their observations and directions for adjusting their reeds, and observed each student's natural playing tendencies. This was done in order to eliminate as many variables as possible apart from the reeds themselves so that I would have a full picture of how oboe reed making can aid high school students in learning to play the oboe. In the next chapter, I will discuss the implications of these findings for high school band directors, high school oboists, studio oboe teachers at all levels of instruction, and incoming collegiate oboe students learning to make reeds, as well as anyone interested in double-reed instruments.

CHAPTER V: DISCUSSION AND IMPLICATIONS

In Chapter One, I introduced a research study of oboe reed making and how it can help improve the playing of high school oboe students. In Chapter Two, I reviewed existing literature on the topic of oboe reed making, including reed making approaches as well as processes and variations of reed making. Chapter Three introduced the design and methodology of my research study, which included several factors: process, participants, research, data collection, and approach to analysis. In Chapter Four, I discussed the findings of the research study under two perspectives: the role of reed maker and the role of listener. In Chapter Five, I will outline conclusions and implications that can be drawn from this research study.

Reed Making in Practice

Throughout this research study and my review of existing literature by reed making scholars, I discovered that certain philosophies and practices of the reed making process worked well within my own process. In comparison, I found that other elements discussed in the literature of reed making scholars did not facilitate my own reed making. I will discuss this in more depth in the following paragraphs.

Timeline

I concur with most oboe reed scholars that the overall process of reed making should span a few days at minimum. It took a few days to finish both batches of my reeds. My first batch of longer reeds took about three days to make, while my second batch of shorter reeds took about four. For both batches, I allowed the reeds time to adjust to their new environments and structures. While I disagree with Jay Light's practice of making reeds all in one sitting, I found in my own reed making that a multi-day process also made it too easy for the reed maker to take too much cane out of a reed. There is some validity to his idea that fully breaking in a reed during the reed making process can ultimately do more damage than good to the reed, as evidenced by some properties of my first batch of reeds. Light says, “I believe that the lifespan of a reed is determined largely by the resin in the fibers rather than the wearing-out of the fibers themselves. Therefore, I would avoid more than a couple of soakings so that the life of the reed isn’t shortened by soaking out the resin before the reed is even made” (1983, p. 48). Though the creation of my second batch of shorter reeds took one more day than the creation of my first batch of longer reeds, I was conscious of the fact that all of my longer reeds did not seem to vibrate as well as they should. For my second batch, while I added an extra day for the cane of the reeds to adjust to their new surroundings, I also made the conscious decision not to scrape as much cane away from this batch, especially from the back. This combination of more time for the cane and less scraping from me created a batch of reeds that had the potential to vibrate more easily overall and allowed the high school students to play with their full sound and good tone.

While half of my high school oboist participants selected reeds from the first batch, both of these students favored the muted quality of these reeds because they were easier to play on and control for their developing embouchures. I conjecture that these two students viewed playing the oboe as something that needed to be controlled, rather than worked with. I believe that as the embouchures of these two students mature and strengthen, they will gravitate more toward the less broken-in style of reeds. I disagree with Light’s idea that a reed maker must create a reed all in one sitting in order to properly preserve the cane’s potential; however, I do agree that using a multi-day process to break in a reed through scraping often leads to over-scraping and does not create ideal results.

Exact versus Relational Measurements

For my own reed making, I used a combination of exact and relational measurements. In order to give each of my reeds a solid foundation, I used exact measurements before scraping the reed by measuring with a ruler and marking with a pencil the exact parameters of each major reed section. Specifically, I marked the bottom of the tip on all four quadrants at 66 millimeters. In practice, I found that not doing so led me to misjudge the sizes of various reed sections. As I make more reeds, however, I believe that my familiarity with the reed making process will increase to such an extent that I would be able to accurately visualize a reed's structure on a reed blank using only relational measurements. Aside from using a ruler to measure out the basic structure of the reed, I did use relational measurements during the adjusting scrapes. That being said, I do not agree that wholeheartedly adhering to one philosophy or the other is the ideal way to make a reed, for I believe that each extreme negates important contributions of the other.

For example, I disagree with Ann Rosandich's (2011) staunch adherence to exact measurements because it leaves no room for the unique properties and behaviors that each piece of cane inevitably has to offer. Reed making is not an exact science and at times requires flexibility. Rosandich favors exact measurement to such an extent that she will perfect the angle of the "V" at the base of the tip by measuring its highest and lowest points. David Weber and Ferald Capps (1990), on the other hand, favor relational measurements in order to look at the reed as a whole unit. While their philosophy allows for the slight nuances that are inevitable in the cane and staple, it lessens the reed maker's ability to isolate these factors when diagnosing the performance of a reed. I also believe that relational measurement leaves a lot of room for error. It should only be used by the most experienced of reed makers that can know a reed's measurements through familiarity by simply seeing it. Weber and Capps state that a reed's heart should be twice as long as the tip; however, if a less experienced reed maker creates a tip that is much too long, the entire basis of measuring the structure of the reed will be off. Therefore, the ideal method of measurement in reed making must be a combination of both.

Sectional versus Holistic Methods of Completion

The main objective of any oboe reed maker is balance. While each section within itself must be structurally sound, the reed as a whole requires each of these sections to work together. The reed making of Ann Rosandich features a holistic approach, while the reed making of Jay Light features a more sectional approach. Once again, based on my own reed making, I find that a combination of the two is the best overall approach. Though I use a combination of both in my reed making, I relied more heavily on the sectional method of completion in my first batch of longer reeds. Because each structural section of my first batch of reeds was correct unto itself, I was surprised when the reeds did not seem to vibrate well when played. In following the sectional method of completion, I scraped too much from each section and largely took away the reeds' ability to become adjusted to each individual player. For my second batch of reeds, I wanted to still rely on the sectional method of reed making; however, I wanted to scrape less from the reed overall so that I could better tailor it to each individual player and better allow the different sections of the reed to work together. While the more scraped trait of the first batch of reeds was favored by two of my oboe students, the abilities of my second batch to be adjusted to each player in terms of their structure and vibrating ability was favored by the other two oboe students.

Preliminary Observations and Evaluations of a Reed

Oboe reed making is a complicated and multifaceted process that requires a wide variety of base knowledge. From this, however, top oboe scholars disagree on methodology from tying to adjustment scraping. As professional performer and collegiate professor Melvin Berman states, “Nothing…should be construed as being absolute. Flexibility and accommodation are the key words. There are simply too many ‘right’ ways to make good reeds to be dogmatic in approaching the subject” (1988, p. v). While no one short of an oboe music educator, professional performer, or professional reed maker has acquired enough knowledge on the subject to be used as an effective and transformative element of the oboe, there are certain qualities of reeds that can be widely evaluated. I will share below a few of these elements, which I experienced throughout this research project.

Profile View of the Reed

For both the reed maker and non-reed maker, a reed’s profile can indicate the basic structure of a reed and provide a clue as to the reed’s natural tuning inclinations. The general shape of a finished reed should be characterized as a downward slope on either side from thread to tip. My reeds, especially the first batch of reeds I made, follow the typical American-style reed characteristic of having more wood taken out of the windows and back than that of other international reed styles. “The American-type reed is characterized by the long scrape…The tip and lay are rather short, and the rind is removed in varying amounts from the back. The overall length is generally shorter…to compensate for the flatness caused by scraping the back so much” (Ledet, 1981, p. 171). Because of this, there is often a slight dip in a reed’s profile view at the windows, a bump-out at the heart, and a final taper to the end of the tip. As I mentioned in Chapter Four, I had scraped the first batch of reeds more than the second batch in preparation for my reed meetings, and this caused the slight dip at the reed's back when viewed in profile. Additionally, these reeds did not seem to fully vibrate, and the projection of their sounds seemed muted to me when I played on them. These reeds worked well for a majority of students, in particular, those students that required work on playing with a round, more relaxed embouchure; however, the students that selected these reeds could not attain a full sound. I believe these students selected longer reeds because they were an easier strength to play on. While I, as an oboist, found these reeds to lack the ability to properly vibrate and therefore produce a full sound, the students required reeds that were primarily easier to play on and allowed them to really relax their embouchures and focus their sound.

Length of the Reed

Similar to gaining a basic understanding of a reed's various thicknesses through the profile view, its length can also provide a clue as to a reed's natural tuning inclinations. It is important to reiterate that for each initial reed meeting, three out of the four participants selected a longer reed from the first batch I created. Of these three, all displayed flat intonation tendencies, which needed to be remedied. The short reeds selected by Elizabeth and later Anne helped foster a sharper, more in-tune sound compared to the three longer reeds selected from the first batch. In other words, the shorter reeds selected by students fostered a sharper intonation, while the longer reeds had a naturally flatter intonation. If a reed plays flat and is measured to be any longer than 70-71 millimeters, it can be clipped or shortened in order to bring up the pitch. If a reed is right at the 69-70-millimeter mark and intonation remains flat, a shorter tied reed could be the answer. Berman explains, "The use of a longer staple (48 millimeters or even 49 millimeters) is a possible solution to the problem of a chronically high-pitched instrument or reed" (1988, p. 37). Contrarily, this means that shorter reeds tend to naturally play sharper.

Simply measuring a finished reed’s whole length, as well as the length of the cane from tip to end masked underneath the thread, can give the inexperienced or non-reed maker a clue as to the reed’s natural tuning inclination. A typical staple length is 46-47 millimeters, and a typical finished reed length can vary between 69 and 71 millimeters. If a student oboist tends to always play flat, a one-millimeter shorter staple, cane, and, therefore, reed may be the solution.

Balance and Symmetry in the Reed’s Construction

Reed makers focus on the varying thicknesses throughout the entirety of the reed, and balance is one of the main objectives. Performer and collegiate educator, Martin Schuring states, “Balance means that every spot on a reed occurs four times – twice on each blade. Each of these four spots needs to be the same thickness…Symmetry means that the tip is the same length at all four edges, that the back comes up the same distance in every place” (2009, p. 132). Because reed making guides and controls vibrations that go through the reed, balance and symmetry are needed structurally to accomplish this. Both the reed maker and non-reed maker can observe the balance and symmetry of a reed to varying degrees.

Other Factors to Consider

Ledet says it best, “The objective of oboe reed making for most oboists is, of course, to provide them with a sound-producing agent which will balance their instrument, embouchure, breath pressure, playing needs, and fulfill their aural concept of how an oboe should sound" (1961, p. 41). In other words, every reed will need to be different because every oboist has different playing tendencies or habits. It is when these habits are incorrect or require improving that reed making cannot always fix. The purpose of this study was to tailor handmade oboe reeds to individual high school oboe students. This meant that for any unwanted tendencies not caused by the reed, I had to adjust the reed to overcome it anyway as best I could. Below are several examples of this.

Posture

Good and healthy posture conducive to producing the best sound in oboe playing facilitates proper breathing, the freedom of relaxed muscles, and the ability to produce a full tone with good intonation. In a few of my reed meetings, I noticed that the poor posture of some of the students was contributing to the unwanted playing tendencies they were trying to overcome. I had to stop myself from telling the students to fix their posture because this research project investigates using reed making to help improve the playing of high school students, rather than as a tool of instruction.

One such example of this was between Anne's first and second reed meetings. In her first meeting, I noticed that she had a slightly hunched posture. Accompanying this was my perception that she was not playing with her fullest sound. I observed that she was not using her full air while playing, which was in part due to her air-restricting posture. This, combined with her tendency to play flat, ultimately led me to give her an additional reed from my second, shorter batch, as the first batch of reeds did not vibrate as easily. I hoped that a shorter reed would not only raise her intonation but would also vibrate more easily with less material for the vibrations to travel through. By the second meeting, Anne indeed preferred the shorter reed to the longer reed because it was more in-tune and easier to play on. She also stated in her second reed meeting that she "likes reeds with a shorter tip." Because of reed making, Anne was able to play more in-tune and with a fuller sound than she thought she could.

Like Anne, Rachel also had a hunched posture. She even played with her legs crossed underneath her on the chair. Also similar to Anne, Rachel didn’t seem to be using her full sound. The difference was that Rachel was for the most part able to compensate for the undesired effects of poor posture with her embouchure, which I believe was also the reason she was not able to project her sound. When I asked her to play as loud as she could on a reed that I knew would cooperate, her sound was still a bit held back due to her poor posture and overly controlled embouchure.

Soaking versus Non-soaking

This research project also showed me the importance of soaking an oboe reed. Refraining from soaking leads to undesired and more uncomfortable playing. This was especially evident when comparing Sarah’s reed meetings to Rachel’s. At the beginning of each of their first reed meetings, it was clear that neither student soaked their reeds in water before playing on them. Because it involved oboe reeds, the subject of this study, I mentioned to each that a reed will not be able to fully function without being properly soaked. Sarah took these words to heart and soaked the reed in her second reed meeting. Sarah said, “I need to soak the reed; it gets too dry without.” Because of this, the seemingly hard and initially unresponsive reed was transformed into a broken-in reed that was easier to play on. Unlike Sarah, Rachel did not soak the reed and, as a result, walked into her second reed meeting with a broken, unusable reed. Rachel said, “The reed was not open, and it broke while I was pinching it open.” Additionally, Rachel stated that the low and high registers were sometimes difficult to play. Soaking would have opened up the reed, thus allowing it to play at its fullest at any register. No amount of reed adjusting on my part would have altered how the cane behaved. Therefore, proper care and treatment of a reed can majorly affect how that reed performs, no matter the amount of reed adjusting.

The Instrument

While reed making can ultimately aid in improving the playing of high school oboists, it cannot make up for an instrument in need of repair. This was the case for Elizabeth and Sarah. While both students noticed an improvement in their sound with the handmade reed, they were not able to get a full picture because of the limitations of their instruments. Elizabeth's reed meetings were characterized by the difficulty of certain high and low notes to sound. This would then be followed by Elizabeth lightly twisting the top and middle joints apart and back together, often multiple times, before the notes would speak. Elizabeth allowed me to use my own reed and play on her instrument in order to determine if it was my reed or the instrument that was to blame for the high and low notes' failure to speak. After having difficulties of my own, I was certain that the instrument was to blame due to improper sealing. Like Elizabeth, Sarah had an instrument that was also in need of repair. While Elizabeth's instrument affected many different notes, Sarah's instrument played the mid B-flat extremely sharp, as if it was a flat, out of tune B. Sarah had compensated for this by pulling much of the reed out her mouth whenever she came across a B-flat. When multiple reeds played the same way, I knew the instrument was in need of repairs. In both cases, no amount of reed adjusting would be able to compensate for instruments that weren't working properly. Although the limitations of their instruments prevented Elizabeth and Sarah from hearing the full potential of a handmade reed, they did agree at the end of their second reed meetings that the handmade reed was more comfortable to play on and had a nice tone.

Importance of Tone

Oboe reed making scholars tend to agree that response, strength, and intonation are the most important factors to work on when making a reed. While most also add tone quality to this list, few have much to say on the subject. Performer and teacher, Jay Light explains, “It [tone quality] may or may not be the least important, but without all the other features, beautiful tone isn’t of much use…I’ll sacrifice a little tone quality for response or stability or range every time” (1983, p. 10). Of course, I agree with Light’s logic; however, I do think that this final characteristic of a good reed should still be an integral part of the discussion on oboe reed making, especially for high school oboists. Light goes on to say that only through constant listening and analyzing of the sound of other oboists, and imitation in one’s own playing, can the oboist truly know enough about tone quality to evaluate it. “As he [the oboist] becomes able to identify the desirable qualities of tone in a good player, he can then learn to better hear what’s actually coming out of his own instrument, make comparisons, and develop his reeds to give him the sound he wants” (Light, 1983, p. 92). Light is one of many reed making scholars that believe tone quality is something that can only be addressed after years of playing can give an oboist the ear for it. While I agree with Light to some extent, I also think that this philosophy can inadvertently cause division between the oboists that study the instrument and the oboists that have just a passion for the instrument or even those just beginning to learn the oboe.

One of my most surprising and unexpected discoveries throughout the research project was learning that high school oboists not only think about tone, but already have a natural ear for what they like and dislike within the realm of tone quality. Sarah was one of the student oboists that commented on the handmade reed’s tone, characterizing it as “pretty, smooth, and round.” She also added that store-bought reeds tended to have a more airy and less round tone than the handmade reed she received from me. Another student, Rachel, described her ideal reed as having a “dark tone” and round sound, and stated that the handmade reed demonstrated these qualities. Out of the four high school oboists, Rachel was the only student to dabble in reed making. She was just beginning to understand oboe reeds through the lens of reed making. While she evaluated the intonation and strength of the reed as she played it, she grew less concerned with perfecting these aspects as they improved through my adjustments. Instead, tone became the most important quality to her, reinforcing her answer that a dark tone would characterize her ideal reed. I asked her what she wanted to study in college. While she was not entirely sure of the answer, she knew that she wouldn’t be studying oboe in college. Thinking about her more immediate reed making goals, she asked me near the end of our first meeting, “How do you make a reed with a dark tone?” It became clear to me that Rachel’s entire passion for the oboe was in the gorgeous dark tone it could produce. I could have answered her that response, strength, and intonation were all qualities that first needed to be obtained on a reed before tone could be considered. I could have answered her that she did not have enough years of oboe study under her belt to be able to expound on the word “dark.” I could have answered her that entering the world of oboe academia would open the door of tone quality to her in due time. Instead, I answered her, because I saw her passion. I told her that, from my own reed making experiences, I get a darker tone when I scrape a little bit more from the back of the reed, and I get a rounder tone when I leave the center of the tip and heart slightly thicker than the outer sides. I concede that it is most likely true Rachel will never know the full extent of obtaining a dark tone in her reed making if she does not study oboe beyond high school; however, her passion in learning how to create a reed’s tone quality could turn into a flourishing future with the oboe.

Implications

This study can be of use to high school oboists and high school band directors. Although high school band directors and high school oboe students may not have a lot of knowledge on oboe reed making, this study offers tools of evaluating reeds for the non-reed maker. It also offers a glimpse into the complex world of oboe reed making with all of its various theories and practices. It also gives the reader an idea of the common issues that high school oboists may be dealing with and how to fix them through reed making. The poster found in *Appendix C* can greatly assist non-oboist and non-reed making high school band directors when it comes to evaluating and adjusting oboe reeds for their high school students. It aids the high school band director in identifying a few common reed problems and possible solutions.

It is my hope that high school band directors and high school oboists will gain a better understanding of just how important reed making is for playing the oboe, as well as how influential it can be on an oboist’s sound and playing tendencies. Though reed making can be very transformative to the playing of a young oboist, it cannot fix the common problems that are often found in the fundamentals of a young oboist’s playing. For example, a student’s posture can be inconducive to creating an adequate air supply or maintaining relaxed and nimble fingers. A young oboist’s embouchure can limit their ability to play dynamics and articulations, as well as good intonation. Problems in these fundamentals will cause a student to struggle with the beginnings and endings of notes, their ability to play with either a full or controlled sound, and intonation that varies among all registers. While reeds can often be entirely responsible for these playing issues, it is more common, especially with the level of high school oboists, that a combination of problematic reeds and inconducive playing fundamentals is responsible.

Reed making is one facet of oboe playing that is rarely addressed with high school oboists. While reed making can in large part aid the student oboist in achieving healthy and comfortable playing, it cannot even begin to make up for the problem of a broken instrument. In this study, I was astounded that half of my participants were dealing with broken instruments that made playing the oboe more difficult and less enjoyable than it could be. I doubt that half of the participants of the study would be dealing with broken instruments if this study was about high school clarinetists.

It is important for both high school band directors and high school oboists alike to know that a reed cannot always be blamed for an unwanted sound, for even when my participants had reeds they liked, their instruments often prevented them from obtaining a higher quality sound or even making a sound at all. In one such case, I tried one of the students' broken instruments and found that I could not make a sound any better than the student could. While I understand that high school music budgets are a factor and that the oboe is a less popular instrument, I think that high school band programs, should they want to continue enriching the lives of young musicians, need to provide students with working instruments. Otherwise, high school instrumentalists will grow frustrated and quit. They might even grow to dislike their instrument, or they might believe they are at fault for the sound that is actually caused by a broken instrument. Given that the oboe as an instrument is less popular, this should give even higher priority to broken oboes, for high school bands cannot always afford to lose an oboist. Therefore, anyone who works with double reed instruments or anyone who is simply interested in double-reed instruments can also benefit from this study.

This study can also be of use to studio oboe teachers at all levels of instruction and incoming collegiate oboe students who are just learning to make reeds. It gives a general overview of oboe reed making and points out certain practices and theories that divide some of the most experienced oboe performers, teachers, and reed makers. In other words, this study demonstrates the wide variety and highly personalized nature of the oboe reed making process. It is not a one size fits all operation. It is quite possible that certain practices that work well for one may not work at all for another. This study should open up a discussion between collegiate oboe teachers and students. Students should feel more comfortable in experimenting with alternate methods in their reed making, while collegiate teachers should understand that they may not always have the answer. They should be humble enough to explore alternative methods of reed making with each of their students, and they should understand that, while their experience is priceless and valued, it may not always give students the answers they need.

This study can also be of use to anyone who makes and sells oboe reeds commercially. My findings demonstrate that the reed maker's philosophy behind reed making can drastically affect the outcome of each reed, from the number of days in the reed making process to the various intentions behind scraping. For example, a strictly sectional view of a future reed may cause the reed maker to unintentionally scrape sections that do not work cohesively. My findings in this study show that all reed making philosophies among oboe scholars, whether they seemingly conflict with one another or not, contain valuable contributions to the oboe reed making process. It is also worth noting that reeds that work well for the reed maker will likely not be ideal for high school oboists; therefore, this study also shows the characteristics of reeds that are most useful to high school oboists. Throughout this study, I was generally surprised by each participant's reed selection. My idea of a high school oboist's ideal reed was far from accurate. This study can also act as a survey of the typical playing issues of typical high school oboists, and it may give reed makers a baseline from which they will create all of their oboe reeds.

For future research, I would like to expand my reed making methodology. I would duplicate this research study by first creating an inventory that was intentionally made using a variety of reed making philosophies. Different reeds in my inventory would incorporate different reed making philosophies, such as sectional and holistic scraping and exact and relational measuring. It would be interesting to discover whether or not a particular method would be favored by high school oboe students. Another idea for future research would involve me listening to the practice and performances of high school oboists, taking notes as to their playing tendencies, and then creating a reed specifically tailored to each of them. This type of exercise could even simply be good practice for me in making reeds, as a reed maker is not well-rounded until he or she can reliably adapt their personal reed making procedure in order to create reeds for other oboists. Reed making could also be used as more of a corrective tool in the playing of high school oboists. For example, students that do not project their sound would be given a reed that enhances this struggle and does not fully vibrate and then would be encouraged to make the reed sound louder than they are used to playing. This study served as a good pilot study, and it allows me to see the benefits that having a larger subject pool or creating slightly shorter reeds would have on any similarly designed study in the future.

In Chapter One, I introduced this research study of oboe reed making and how it can help improve the playing of high school oboe students. I reviewed existing literature about oboe reeds and reed making in Chapter Two. In Chapter Three, I described the overall design, methodology, and research elements of my research study. Chapter Four was a discussion of my findings from the research study. In this chapter, Chapter Five, I discussed various implications and conclusions that could be drawn from this research study.

Through this study, I have gained a better understanding and appreciation for the seemingly impossible task many music teachers face. I share my own findings and draw my own conclusions from my work with high school oboists in the hope that they can be useful to other oboe reed makers, players, and teachers, as well as expand the oboe knowledge of other musicians. This research study has helped me to further refine my own unique perspective and understanding of oboe reeds, while simultaneously demonstrating that there is no one way to make an oboe reed. In viewing the reed making and oboe communities as jigsaw puzzles, I am reminded that, as a reed maker, oboist, and musician, I will never be finished learning. I will always be refining, re-evaluating, and testing the parameters of the little puzzle piece that I have formed and the unique voice I am constantly developing. Learning is a lifelong process. As Eric McCormack put it, “Each one of us fulfills a piece of a larger puzzle.”

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APPENDIX A: PARENT PERMISSION LETTER

Dear Parent/Guardian,

My name is Jenna Hansen, and I am a graduate student at the University of Wisconsin – Stevens Point. I am currently working on my final project for the Masters in Music Education degree with an emphasis in Oboe Studio Pedagogy. In early January, I emailed your child's band director describing my graduate thesis project (please see the next paragraph for a description) and asking if they had any oboe students who were interested in participating. Your child expressed an interest in wanting to participate.

My project will focus on reed making – specifically, reed making for high school-age students. My goal is to make at least one (free) reed for each student before the 2022 Solo & Ensemble. I am interested in improving my reed making and specifically tailoring it to the needs of each oboist based on their answers to a common criterion that I have created. The process for my final project is to meet with each student (and their parent/guardian) two times over a period of about 1-2 weeks at either your high school, the Wausau Conservatory of Music, or the UW-Stevens Point campus. For the first meeting, I would bring a handmade reed and have them play on it, asking each student for their feedback and listening to how the reed sounds as they try it. I will adjust the reeds there, continuing to adjust the reed and having the student try and critique it until it is a good fit for the student. After a week or so of the student playing on the reed in band/orchestra class and practicing at home, I would again meet with the student (and their parent/guardian), listen to how the reed sounds, ask each student for their feedback, and adjust the reed until it is a good fit. (Oboe reeds change dramatically once they are "broken in.") At the end of the project, each student can look forward to having a high-quality homemade reed that is adjusted and tailored to them just in time for Solo & Ensemble!

This final project is being overseen by Professor Stacey Berk, Professor of Oboe (Stacey.Berk@uwsp.edu) and Dr. Rachel Brashier, Director of Music Education (Rachel.Brashier@uwsp.edu) at UW-Stevens Point. I encourage you to contact myself or them with any questions or concerns about the process.

I have filled out a background check with the Wausau School District and have gone through their Volunteer Sign-up process.

A little information about me: I attended DC Everest Senior High School and played in the band/orchestra/marching band. For undergraduate studies, I attended Carthage College in Kenosha, WI, receiving Bachelor of Arts degrees in Oboe Performance and English. For my Master's degree in Oboe Pedagogy, I attended UW-Milwaukee for the first year and UW-Stevens Point for the second. I currently work full-time as an Administrative Assistant at Trinity Lutheran Church & School in Wausau, and my employee biography can be found here: [redacted]

By signing the bottom portion of this informational sheet, you, the parent/guardian, are giving your child permission to participate in my graduate thesis project. Also below, please indicate your date/time/location preferences for the two meetings. The two meetings will ideally be about one week apart. Please plan on attending the reed making meetings with your child (depending on the adjustments needed, the meetings can take anywhere from 15-45 minutes). Please return in the bottom portion of this form to me – either as an image/scanned email attachment or in-person at the first meeting.

Thank you for your participation in my graduate thesis project!

Jenna Hansen
[redacted]

****

<u>Meeting Location Preference (please circle):</u>

Your Child's High School   Wausau Conservatory of Music   UW-Stevens Point Campus

<u>What days of the week/dates and times work best for you?</u>

____

____

Your Child's Name: ____

____   ______________________
Parent/Guardian Signature   *Date*

APPENDIX B: REED EVALUATION FORM

NAME: ____

WARM-UP

(5 minutes)

- Slowly play a variety of scales with whole notes: low register up to high register and back down to low register.
- Play a few scales at your normal speed: the first few should be all slurred, while all of the notes are tongued for the last few.
- Slur up to and down to various intervals (e.g. a fifth), beginning at middle range and gradually expanding to the lower and upper registers.

REED EVALUATION

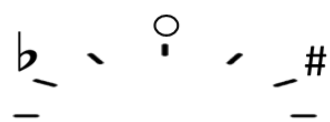
Responsiveness

Rate how responsive the reed is when you play the following notes at *mp-mf*.

	The note will not speak		The note cracks/delays before speaking; Only speaks when played loudly		The note clearly speaks at any volume
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5

Pitch

Using a tuner, play and hold the note A4.
Where on the scale is the reed's tuning? *(Please draw)*



Play your normal scales while keeping an eye on the tuner.
Record any note names that are exceptionally out of tune (e.g. a sharp middle C would be written as <u># C4</u>).

Are you having to adjust your embouchure more than usual to keep notes controlled and in tune?

Tone & Focus

Play a brief excerpt from a solo, ensemble, or band piece you are currently working on.
Does the tone sound too bright or too dark?

Do you feel like you need to control the sound/tone produced by the reed or over-project it?

Crow the reed. Do you hear several different notes, a few different notes, or a single note?

APPENDIX B: REED EVALUATION FORM (CONT.)

What qualities are important for you to have in an ideal reed?

What is the most difficult thing about playing the oboe?

HISTORY

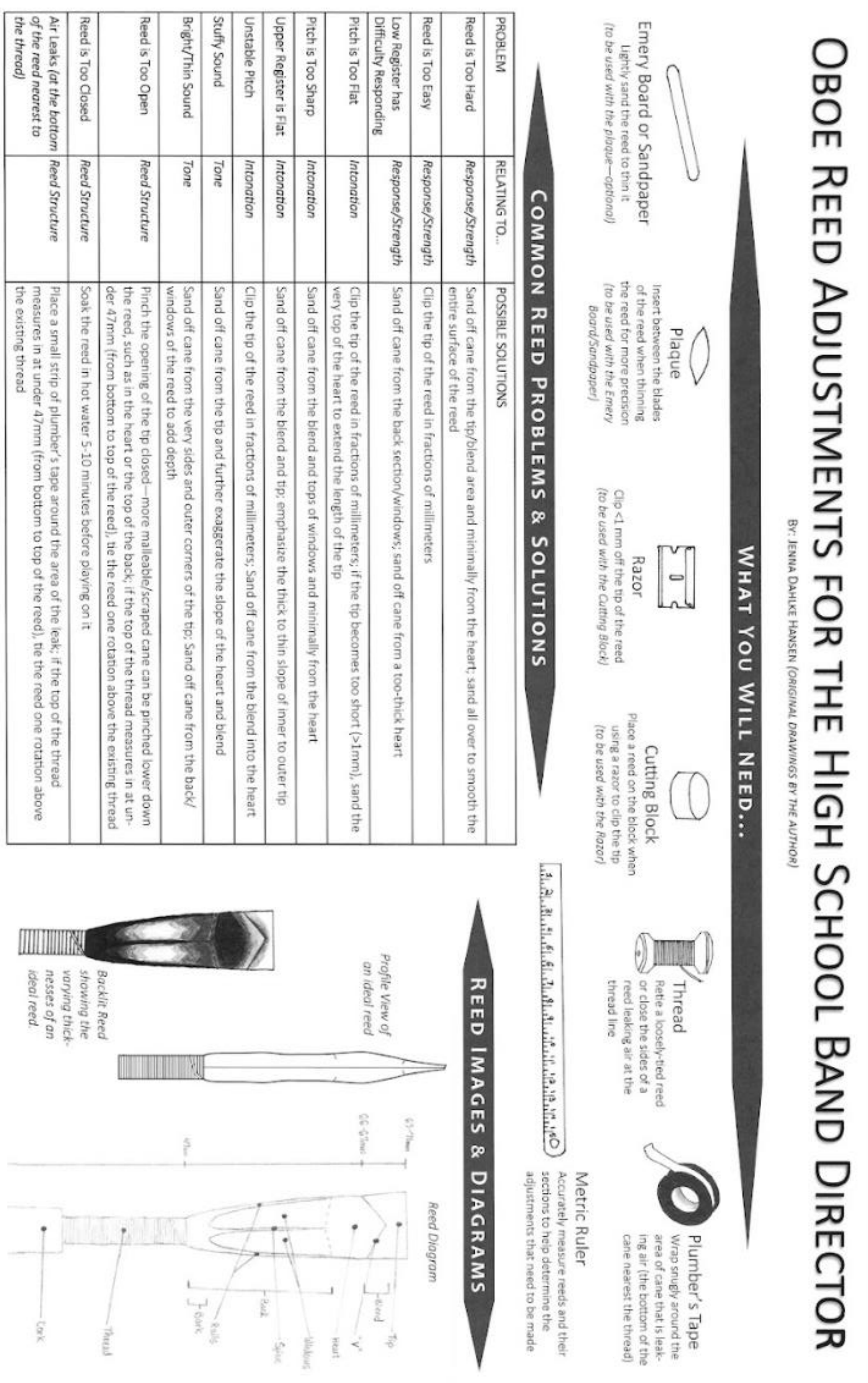
How do your current reeds typically play (pitch, dynamic range, responsiveness, etc.)?

What do you struggle with the most with your reeds?

Our Final Meeting for Reed Adjustments____

Thank you *for participating in my graduate thesis project!*

APPENDIX C:
REED MAKING POSTER FOR THE HIGH SCHOOL BAND DIRECTOR



OBOE REED ADJUSTMENTS FOR THE HIGH SCHOOL BAND DIRECTOR

By: Jenna Dahlke Hansen *(original drawings by the author)*

WHAT YOU WILL NEED...

Emery Board or Sandpaper
Lightly sand the reed to thin it
(to be used with the plaque—optional)

Plaque
Insert between the blades of the reed when thinning the reed for more precision
(to be used with the Emery Board/Sandpaper)

Razor
Clip <1 mm off the tip of the reed
(to be used with the Cutting Block)

Cutting Block
Place a reed on the block when using a razor to clip the tip
(to be used with the Razor)

Thread
Retie a loosely-tied reed or close the sides of a reed leaking air at the thread line

Plumber's Tape
Wrap snugly around the area of cane that is leaking air (the bottom of the cane nearest the thread)

Metric Ruler
Accurately measure reeds and their sections to help determine the adjustments that need to be made

COMMON REED PROBLEMS & SOLUTIONS

PROBLEM	RELATING TO...	POSSIBLE SOLUTIONS
Reed is Too Hard	*Response/Strength*	Sand off cane from the tip/blend area and minimally from the heart; sand all over to smooth the entire surface of the reed
Reed is Too Easy	*Response/Strength*	Clip the tip of the reed in fractions of millimeters
Low Register has Difficulty Responding	*Response/Strength*	Sand off cane from the back section/windows; sand off cane from a too-thick heart
Pitch is Too Flat	*Intonation*	Clip the tip of the reed in fractions of millimeters; if the tip becomes too short (>1mm), sand the very top of the heart to extend the length of the tip
Pitch is Too Sharp	*Intonation*	Sand off cane from the blend and tops of windows and minimally from the heart
Upper Register is Flat	*Intonation*	Sand off cane from the blend and tip; emphasize the thick to thin slope of inner to outer tip
Unstable Pitch	*Intonation*	Clip the tip of the reed in fractions of millimeters; Sand off cane from the blend into the heart
Stuffy Sound	*Tone*	Sand off cane from the tip and further exaggerate the slope of the heart and blend
Bright/Thin Sound	*Tone*	Sand off cane from the very sides and outer corners of the tip; Sand off cane from the back/windows of the reed to add depth
Reed is Too Open	*Reed Structure*	Pinch the opening of the tip closed—more malleable/scraped cane can be pinched lower down the reed, such as in the heart or the top of the back; if the top of the thread measures in at under 47mm (from bottom to top of the reed), tie the reed one rotation above the existing thread
Reed is Too Closed	*Reed Structure*	Soak the reed in hot water 5-10 minutes before playing on it
Air Leaks *(at the bottom of the reed nearest to the thread)*	*Reed Structure*	Place a small strip of plumber's tape around the area of the leak; if the top of the thread measures in at under 47mm (from bottom to top of the reed), tie the reed one rotation above the existing thread

REED IMAGES & DIAGRAMS

Profile View of an ideal reed

Backlit Reed showing the varying thicknesses of an ideal reed.

Reed Diagram