

# **Mental Notes:**

## **Exploring the Capacity of the Mind to Enhance Marimba Performance**

By: Natalie Klco

This thesis is presented in conjunction with a performance of Daniel Levitan's *Concerto for Marimba and Percussion Orchestra* performed on November 13th 2014 with the Ohio University percussion ensemble under the direction of Mr. Roger Braun. <sup>1</sup>

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<sup>1</sup>DVD included or available electronically at [natalieklco.yolasite.com/levitan-concerto-for-marimba-percussion-orchestra](http://natalieklco.yolasite.com/levitan-concerto-for-marimba-percussion-orchestra)

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# THESIS APPROVAL SHEET

**Thesis Title:** *Mental Notes: Exploring the Capacity of the Mind to Enhance Marimba Performance*

**Student's Name:** Natalie Klco

This thesis has been approved by  
The Honors Tutorial College and the Department of Music

---

**Mr. Roger Braun**  
Professor, Percussion  
Thesis Advisor

---

**Mr. André Gribou**  
Professor, Piano  
DOS, Honors Tutorial College

---

**Dr. Jeremy Webster**  
Associate Professor, English  
Dean, Honors Tutorial College

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*Because your own strength is unequal to the task,  
do not assume that it is beyond the powers of man;  
but if anything is within the powers and province of man,  
believe that it is within your own compass also.*

—MARCUS AURELIUS

# Chapter 1

## Background

The man who introduced me to the marimba has often felt it necessary to calm the concerns the world may express for my emotional stability by announcing that I am “in a committed relationship with my marimba”. And sometimes I believe him. For a long time, it was a part of my identity: a piece of me that often became the only part of me people ever knew. I was that girl who played marimba in hallways and storage closets because it would not fit into practice rooms. The girl who found herself in places she arguably did not belong because there was a marimba there pleading for her attention. And the girl whose generally laid-back approach to life suddenly shifted when the physical integrity of a marimba was in danger. It was the act of practicing/playing for hours upon hours that gave me the clarity to live productively, the emotional outlet to live happily and an identity within the society surrounding me.

As I found myself more engrossed by my personal experiences with the marimba, I began searching for a community of marimbists in whose company these thoughts and feelings did not seem so out of place. I finally found this community in college. Very early in my academic career, I was granted opportunities to perform in advanced ensembles, master classes, recitals, and concertos. My passion for this instrument

was finally validated by a studio of older, more experienced performers in whose eyes I became a genuinely dedicated marimbist. With the guidance of those surrounding me, my solitary world of marimba became aware of the external world of marimba that existed before me. And I was welcomed into this external world as if it had been patiently awaiting my arrival...as if this community knew that I belonged long before I became aware of its existence.

## **1.1 Marimba History**

It may be argued that the history of the western art marimba as we know it started in 1894. Though the world was previously no stranger to the concept of percussively performed slabs of wood/rock, it was not until this year that the chromatically tuned marimba was invented by Sebastian Hurtado and Julio Paniagua Martinez. The five years following 1908 mark the initial movement of the marimba from its original position in community active festivals and dance to the stage for inactive spectators as the Hurtado family toured the United States with their marimba band.

The introduction of chromatic mallet percussion into western music at this time was burdened by cliché: representing either the rattling of bones (death) or, in the case of Vaudeville, preposterous comedy. The classic example of the latter is the story of the xylophone player who absurdly finds a banana impeding the resonance of his resonators. Needless to say, many historic figures very consciously set out to bring a legitimacy and respect to the marimba. Two striking examples of the 1930's are Clair Omar Musser's two marimba orchestras consisting of approximately one hundred marimbas traveling across the United States and Europe performing mainly transcriptions of Romantic/Classical compositions. By the late 1940's Musser, at this time a professor at Northwestern University, succeeded in creating the first marimba degree



Figure 1.1: Deagan King George Marimba: Total of 102 designed in 1934 for Musser's International Marimba Symphony Orchestra.

program supported by an institution of higher education.

Throughout these years of increased dignity, it is interesting that the number of featured notes of the “standard” marimba actually decreased. Advancements in marimba technology were not highly studied and materials for metallic resonators were unavailable (largely due to WWII). Until the mid-1950's when Musser created his own company, mallet percussion design and construction was done by one company, The J.C. Deagan Company. It was not until the 1980's with the determination of Japanese performer and virtuoso, Keiko Abe, that the Yamaha company learned to construct 5-octave instruments, the current gold-standard for marimba.

Only a generation later, there are now a handful of marimba manufacturers across the country. Research into their optimal construction has taken a much more scientific approach. Bars are often tuned to the third harmonic (compared to only the first in early marimbas) with the utilization of strobe tuners and advancements in the artistry of tuning techniques. We now understand more fully the implications of the cross-sectional shape, material, and harmonic filtering possibilities of our resonators. We now live in a world with marimba manufacturer job titles of “Master Tuner” and “Tuning and Acoustical Researcher”. Largely because of this recent dedication to the scientific



nature of this instrument, the world has been opened to precisely tuned, fantastic sounding instruments. There is no comparison to the intensity and purity of sound coming from a current marimba to those constructed in the 1920's (though of course the marimbas from the 1920's have other beautifully alluring nostalgic qualities).

## **1.2 Introduction to the Thesis**

This thesis is not concerned with the marimba itself, but with the performers who connect to it. We, as a community of marimba players, are arguably in our 3rd/4th generation (depending on how strictly you wish to classify). We know our ancestors and look back on them with admiration and gratitude. We remember them for their ground-breaking performance experiences and through their music as many performers were also prolific composers by both passion and necessity. We are delusional within a relentless endeavor to prove to the world that a quarter ton instrument sensitive to heat, moisture, and human contact is portable. In fact, a main concept for this thesis is that marimbists are, in many cases overly dedicated perfectionists, at times to the point of endangering their physical well being.

More seriously and more personally, I found myself willing to inflict bodily harm rather than allow myself the comfort of skipping a note or two that only a handful of people in the world would ever notice. I became addicted to repetitive motion...because within the habitual and predictable nature of the world, there are beautiful surprises that one will only find astonishing when viewed against a background of meticulously formulated expectations. Only when the macroscopic qualities of an action (e.g. how to maneuver and coordinate 4 mallets simultaneously) become second nature are the microscopic qualities noticed. It is these microscopic qualities through which I learned about myself. I became intimately familiar with my subconscious, my creativity, and

my focus. Within the context of marimba performance, I discovered exactly the type of person that I would spend the rest of my life developing. And as the repetitive became the mundane, I developed the ability to systematically view the unknown world beyond my repetitious observatory. This repetition was the means through which the old me thrived: consumed by a blind and naive love for the marimba. But, as I have discovered the hard way through an allegedly irreversible degeneration of the tendons of my elbows, a marimbist's body is not made to experience the excess of physical repetitions that may quiet and intrigue our minds.

I found such personal delight when my fingers and hands developed bizarre calluses and growths to deviate from their natural form that is just not designed for such activities. And so I should not have been surprised when my body began to deviate in other, less desirable ways. For a long time in spite of the warnings and pleas of those who cared for me, I remained convinced that no amount of pain would keep me from the passions that seemed now to be the only way I knew to vigorously and emotionally connect with the world around me. When I finally (and grudgingly) agreed that the respect I held for the relationship between myself and my instrument could not exist in such a state of evaded reality, I stopped playing.

This thesis details the journey of my connection with the marimba away from an uncontrolled passion for performance, through misplaced and undeserved resentment, to finally arriving at a place of balance between my physical abilities and my mental/emotional desires. I have found that, with mental techniques (later referred to as ideation), repetition is safe. Because, as far as I can tell, there are no cyclic strains placed on the deliberate control of neuronal connections. Specifically for marimba players and generally for performers of any type, my purpose is to introduce the pain only for a finite time so that one may avoid a reproduction of these circumstances, and enhancements in performance potential may be made through exploitation of the

facility of the mind. I will do this by proving that marimbists may continue to pursue their passions in a much less physically rigorous way, avoiding the process of physical damage that has developed along with the development of the marimba as a western art instrument over the past century. Though I was not always this composed, I am glad for my circumstances because the marimba and I have together come to more meaningful conclusions on the nature of the mind-body relationship within the context of performance.

## Chapter 2

# Biological Literature

Before learning to function in the world without constant physical marimba connection, the most emotionally safe and deceptively productive thing for me was to learn the academic understanding of my circumstances. And though I use such diminutive phrases as *deceptively productive* to emphasize the replacement with which I was attempting to fool myself through this pursuit, I am thankful that I learned about the structure and biomechanics I had always taken for granted. In such an auditory pursuit as music performance, it can be easy to lose sight of the importance of the body. It is essential to realize, however, that the only way to responsibly enjoy those out-of-body and into-instrument experiences is to first bring the body to the absolute center of attention, knowing its structure and its physical needs. This section is an introduction to tendon research not for the sake of comfort and entertainment but for the sake of awareness.

### 2.1 Structure and Biomechanics

The dry composition of tendon ( $\approx 30\%$  of total tendon mass...the other  $\approx 70\%$  is water) consists of  $\approx 70\%$  collagen I (the same collagen found in bones and ligaments) with the remaining  $\approx 30\%$  consisting of proteoglycans, glycoproteins, and small amounts of

different types of collagen (creatively named with increasing integers). Though many of these molecules have been identified, many of their specific interactions within the tendon are still speculative. It has been observed that different balances of these molecules in an area of tendon produce different biomechanical characteristics of the tendon such as thickness, stiffness, and reaction to loading.

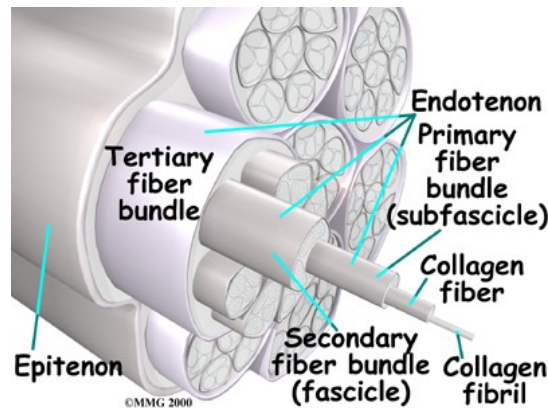


Figure 2.1: Packing structure of collagen within tendon. Image by Activemotionphysio.ca

The collagen molecule is first produced within a structure called a fibroblast. Each collagen molecule consists of three strands of amino acids which are then interwoven in a triple helix structure. These collagen molecules are then aggregated by cross-links which are essential to the strength and mechanical characteristics of the tendon.<sup>1</sup> As you can see from Figure 2.1, there are casings, the endotenon and epitenon, which surround bundles of these structures making a hierarchy of structural units. These casings are the primary source of vascularity for the tendon as well as the termination point for the nerves which innervate the tendon, an important fact in the diagnosis and treatment of tendinopathy (see section *Not All Tendinopathies are Tendinitis*).

<sup>1</sup>Recent research suggests that these cross-links may denature below body temperature [7] (the specific temperature depending on the levels of hydroxyproline[13]: one of the mentioned amino acids which makes up 15% of the collagen molecule)[10] causing the accepted triple-helical structure to be incorrect for physiological situations. The accuracy and implications of this information have not yet been discussed by the medical community.

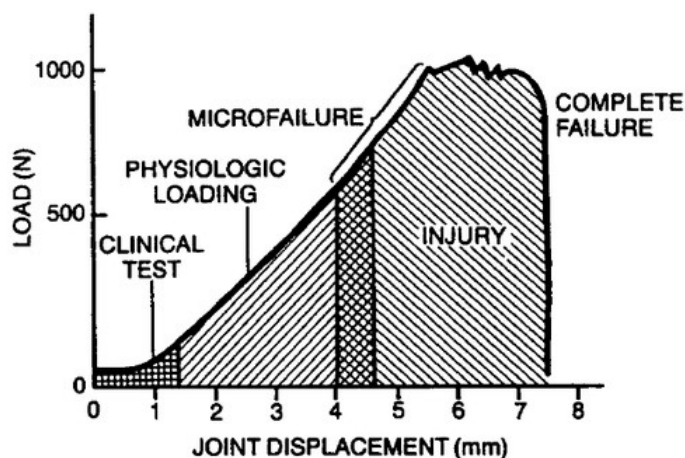


Figure 2.2: Classic stress-strain curve of tendon [10]. Notice the toe region which consists of the straightening of the wavy characteristic of relaxed tendon fibers. The physiological range ends with microscopic failure.

The biomechanics of tendon can be easily expressed as that of a viscoelastic material, a material which shows both elastic and viscous properties when undergoing deformations. An important aspect of viscoelastic materials for musicians to know is that their biomechanical qualities depend on time thus they respond differently to repetitive motion (referred to as cyclic loading) than they do to constant forces. Because much of the use of tendons in musical performance and practice is cyclic, we will focus here.

Figure 2.2 shows the generally accepted relationship between the stress applied to tendon and the strain which it exhibits. Notice the region of microfailure just outside physiological loading range. As cyclic loading is applied to the tendon, however, its elasticity decreases and an amount of permanent deformation begins to accumulate more with each loading cycle. This cyclic situation is often visualized as a literal shift in the load-displacement relationship to a point that microfailure is found within the physiological range. Of course, microfailures in themselves are not a reason for alarm.

It is only when the rate of accumulated microfailures (established, for example, by hours upon hours of cyclic loading) exceeds the rate of the body's natural ability to repair the tendon that such microfailures can become macroscopically influential.

## 2.2 Not All Tendinopathies are Tendinitis:

Since 1976, many medical professionals have discussed the classification of tendinopathies, the term now used to refer to general tendon pain. In the past, tendonitis was used in all cases assuming that the main problem was the inflammation of the tendon itself. It is now known that two main things can happen (1) the peritenon/synovial sheath/epitenon surrounding the tendon can become inflamed which should be referred to as peritenonitis/tenosynovitis or (2) degeneration within the tendon itself can occur at any level within the aggregate collagen molecular structure which should be referred to as tendinosis. The assumption that all tendinopathies are tendonitis would advocate the use of anti-inflammatories. Though inflammation is often an effect of tendon degeneration, treating tendinosis with anti-inflammatories is not treating the root of the possible degredational problem. Remember that the nerves, which provide a line of communication between your tendon and your brain, terminate on the epitenon surrounding the tendon. **This means that your body has no way of signaling that it is experiencing pure tendinosis.** Unless you are in-tune with your body well enough to detect the biomechanical differences of degenerating tendon, it is likely that the existing degeneration will not be detected until this tendinosis is paired with an inflammatory problem in the tissue surrounding the tendon. Currently, the only way to be sure whether the root of tendon pain is exclusively inflammatory or a larger indication of tendon degeneration is to have an MRI conducted on the joint.

## 2.3 Repair vs Regeneration

When our tendons do manage to repair themselves, they often heal inadequately: plagued by adhesions and scar tissue obstructing the freedom of the sliding of tendons within their sheaths. Each of these types of obstructions changes the biomechanical properties of the tendon as a whole and creates areas of weakness and non-uniform force distributions within the tendon. Current research suggests that fetal tendon, whether it experiences the chemical balances of the fetal or adult environment, heal in a regenerative manner with no scar tissue or adhesions [16], regenerating the original tissue instead of attempting repairs with tissue foreign to the original environment. Research into this discrepancy is currently being stimulated by the discovery of a strain of mice (MRL mice) whose adult tissue seems to heal in a regenerative way [16]. Having an adult mammalian model of regeneration of tissue could offer a great amount of insight into the environment which is conducive to regeneration as opposed to repair of our biological tissue.

The current explanation of tendinopathy is an accumulation of microtraumas at a rate greater than the body's ability to repair. This theory is consistent with the shifting of the stress-strain curve. We can see from this list as well as table 4.1 that (to a marimbist at least) there is an overwhelming number of variables which affect the ability of tendon to regenerate or repair. Granted, many of these variables are well known, but there are many more which are not. So until we, as professionals and amateurs in the medical profession, discover the mechanisms behind these processes, we, as musicians or athletes of sound, must regard our bodies not as a tool to be forced and stressed in the name of productivity but as a singularity to be treasured. We must find a way to communicate with our bodies, entering it back into the relationship between mind and instrument.



## Chapter 3

# Performance Psychology Literature

It is amusing that the two references which have set themselves apart in importance to me during this process are not about the marimba. In fact, only one is about music at all. The first was recommended to me by marimba artist and pedagogue, Gordon Stout. Written specifically for piano performance with the explicit expectation for the concepts to be widely applicable to general physical performances, Luigi Bonpensiere wrote what is colloquially referred to as *New Pathways* [4] in 1953. Some thirty years later I argue, Timothy Gallwey introduces the world again to Bonpensiere's concepts through the vehicle of *The Inner Game of Tennis* [6]. As there is an interestingly unexpected isomorphism between the concepts discussed by these two authors, choosing the vocabulary of one commits minimal loss of content. We will here choose the vocabulary of Bonpensiere as it tends to be more transparent and based in function rather than numerology. Before we begin into the account of mental-physical self discovery, it is necessary to discuss a concept which originates largely in philosophy but has found its way into much of the currently available literature on the mental aspects of performance.

### 3.1 Multiple Selves

Throughout history, philosophers have taken it upon themselves to ponder the self — an atrociously ambiguous term with functional use only as far as we agree not to dig too deeply into its meaning. But for ages it has been of concern. Whether it is an innate aspect of our person or whether it is something to be defined and nurtured. Whether it is suppressed or heightened as it functions fundamentally differently in response to stimuli: drugs, religion, socially internalized cues. Of direct importance to the performer seems to be whether we have more than one. And if there are multiple selves, do they conspire against one another for precedence over the efficacy of the body?

In Bonpensiere's model, a single person is structured as a combination of "V" and "V2" where "V" represents the conscious **V**olition and "V2" represents the physical reactions to the ideation committed by "V". What are these physical reactions? They are the muscular contractions, the neural activity, and the unspoken connection between the two. Though "V" is granted control over macroscopic decision making — where to search the world for external stimuli and what goals to establish as a result — it has no access to control the responses within the realm of "V2". However, it is through the volitional ideation performed by "V" that the conscious mind guides "V2" towards a determined desirable result.

It is not only in the range of capacities that "V" and "V2" differ. Their expertise lies in opposing realms as well. Whereas "V" revels in the linguistic explanation of the mechanics of the situation, "V2" excels with mental pictures and kinesthetic memory of physical experiences. Most performers could describe the various necessary forces and torques (not necessarily in technical terms) for the achievement of their particular goal. However, no professional or leader in any field has achieved such a status without allowing "V2" the time and physical experimentation it requires. Even then, the art

of performance rests in “V”’s ability to trust the knowledge that “V2” has attained in spite of its inability to satisfyingly understand within its word-worshipping domain.

### 3.2 Self-Talk

There have thus far been hints at the function of words within the “V”-“V2” relationship. We have grown up talking to ourselves: often relying on simple reminders that stick better in our memory after being verbalized. There are concepts of the healing powers of positive thinking [19] and the transformational possibilities of the affirmative compliments we have the ability to give ourselves. Many accounts of advice given to those suffering from performance anxiety include examples of positive self-talk. Something as general as “You can do this”, “You know how to do this”, “You have done it hundreds of times before”, to specifics of reminding the self conscious worries that “in music, no one in the audience is against you”. These expressions are useful only within the assumptive world that there exists a magical combination of words that will put the situation into a new perspective, a “safe” perspective controlled by “V”. But in the now understood description of “V” and “V2”, the commentary takes on another role. The continuous commands are those of “V” attempting to force its control upon “V2”. Not very trusting, right? “V” is assuming “V2” will fail and thus never allowing it the serenity necessary to execute what it surely knows how to do.

Secure performing is thus not about poetic accumulation of the proper code phrase, but it is about quieting the apprehensions of “V” in a process of trusting “V2” to fulfill the products of training and ideation. It is these moments of trust that allure performers. This sense of absolute affirmation of efficacy that performers refer to with nostalgia and desire. This sense of not realizing fears, doubts, and concerns because the fullness of the moment will not permit such trivial distractions.

## Chapter 4

# The Levitan: Concerto for Marimba and Percussion Orchestra

### 4.1 Discovering the Learning Process

When I was packing my bag for Europe, I knew that I would be traveling from planes to trains to busses and that any excess weight would be both painful and counteractive to the healing process to which I had finally committed. Had the physical sheet music to the concerto already existed more tangibly than a scan on my computer<sup>1</sup>, I would have likely left it at home. There was very little part of me that wanted anything to do with the marimba. Sure, I was going for the sake of my passion for physics research, but I later realized that this trip served also as an escape. I was glad to be running away from this relationship. Glad to be experiencing what it would mean to live out from underneath the burden of this love.

I cannot remember why I started. Out of longing for the safe and familiar, perhaps.

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<sup>1</sup>The music had been lost by the publishing company and now existed only as a hand written 100+ page score saved by the last (and first) performer of the piece. By committing to perform this piece, we were committing also to the onerous task of notating all individual parts of this 30-minute concerto.

I begin notating the marimba soloist part into computer software. I was detached. Noticing that there were indeed notes and rhythms of mathematical precision but associating no meaning to them. They were black marks on a screen – only there long enough to be transcribed before the scrolling of the screen took them away and out of existence. I admit I was enjoying the patterns – the way their integrity was not hampered by the delineation of measures but seemed instead to ignore the decisive authority we are accustomed to granting these firmly erected lines.

This work did not seem to be a means to an end. I only half-heartedly committed to performing this piece because I was not convinced that I could do it. In the middle of my longest break from marimba performance, I had no idea where my technique was. I was fearful that the mallets would feel foreign to my hands and the carefully crafted strokes that I had watched mold into my arms were lost. Thus, as I was notating the marimba music, I was not certain that I would ever perform it. I was not certain that I would ever hear the intent of the composer being constructed by my own volition or feel its evolution in real time. I was not planning for the future. Quite simply, I was trying to retain the marimba in the smallest aspect of my life not because I loved it then but because I remembered its capacity for love within me. I remembered what I used to experience. I remembered my thoughts the first time I truly heard the instrument.

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#### **4.1.1 The Marimba in Memory**

Before I hear the sound my perception is saturated by his body, the existence of which is heightened by the beauty of the vibrating rosewood beneath his hands. He is cut, sliced at the waist below which the body of the man and the instrument seem indistin-

guishable. Only the lack of concern on the face of the performer provides the necessary assurance of his physical integrity. It is the relaxation of his gaze mixed with the intensity of his apparent perception that emphasizes the serenity he feels as he fearlessly explores a finite, familiar space with infinite acoustic potential. He commands control over the mallets. One cannot be sure where the mallet starts and his body stops – for his body no longer seems to be a mechanical source of directed energy, rather it seems now to function more honestly as a window into the spiritual moments that have created the man from whom I find myself unable to remove my gaze.

Finally my eyes relinquish the ownership they had claimed on the totality of my communication with the world and I hear the marimba. At first, it takes a conscious correlation between the sensory data of my eyes and that of my ears to realize the source of these sounds. With no



personal historic ledge of familiarity to grasp onto, the marimba is free to aurally define itself independent of my expanse of preconceptions. At that moment, and without conscious realization, the marimba created within me such a detailed identity that nothing will ever replace its ability to affect me.

It is tempting to assume that this man's performance originated in unfamiliar and awkward beginnings squinting at notated music and experimenting with sticking patterns and physical limitations. But, as I watch the comfort which seems not only to emanate from the performer but from his instrument as well, I am not convinced of these origins. Had I been told in that moment that this man was always this way, never

existing as a younger version incapable of defining himself as he does now, I would have believed it – because the intimacy of the soundscape in which he envelops me is not the socially ingrained introduction of reservation and detachment, but is instead honest and vulnerable. Thus this quality must have existed before his interaction with this world.

But this is no act of prestige – for the performance stems as a celebration of the dedication and work that must accompany this man's understanding of the universe. And though it may seem at first glance that the act is a guiltless desertion from the responsibility of consciousness, one realizes that the substantiality with which the performer regards his existence and the grace with which he moves betrays a fundamentally different experience. In moments such as these, the body and mind have found a release that evokes internal feelings of heightened awareness – a higher-order introspection. I see him knowing the moment before it happens as if the world has offered him sight of the future as tribute – but one realizes that he knows the moment only because he has made it. He stands before his audience to create and offer a new perception of reality. So maybe Socrates was right and life must be examined – for it is the performer who is simultaneously learning and teaching the ability to use reality and his own mind to mutually discover each other.

As a creak in the ceiling resonated by the structural acoustics of the hall transiently breaks this mental-emotional rapture, I suddenly realize that I am not here to hear the results of his performance but to experience his performance with him and challenge him along the way – to serve as an obstacle to the oneness he knows he can achieve in the practice room else he would not be here. And though the space is designed to focus light upon the performer and resulting sound upon the audience, it is not only to see and hear the performer commit acts in testament to the potential of man that the audience has come. They have come also to see themselves. It is not the audience

which gathers in existence for the performer nor does the performer exist upon a visual pedestal for the sake of the audience – they exist autonomously, compelling each other to excel. The performer appreciates the insightful judgments of his audience as they push him to a deeper place of self-discovery. The more the audience expects and demands of him, the more he gains as it necessitates the most intense utilization of the full extent of his skill – an extent previously hidden from even himself. The performer then returns the expectation of self-examination. Each body thus offers a playing field for the mutual discovery of latent capacities.

Without apparent reservations, the performer is presenting a self-portrait in Nozick's philosophical sense [11]. The performer portrays himself not only as someone who looks and acts as the performer residing in front of his audience, but as a man who knows himself as the performer does. He watches his audience observe him knowing himself. So in that moment, the performer must inevitably experience the vulnerability of a coexistence with those who see him seeing himself. In these moments, the performer is left to wait as the audience reciprocates with a similar sense of knowing themselves in his presence.

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There was a length of time between the notation of the first movement and the beginning of my commitment to learn it mentally. I cannot say for sure how much time because time passes strangely when conducting research. However, I remember the moment of my decision. One morning before heading into the lab, I was eating my breakfast (which in Italy I would consider more of dessert) and looking out over the sea. I recalled that I had experienced this beauty before in the performance I have just painted for you. It had been a long time, but I remembered it. Not in words but in the marimba which began playing in my head. While enjoying the marimba-colored glasses



through which my beautiful surroundings were being seen, I realized that I could control that marimba. Not perfectly of course, but that influence upon it was not outside of my ability. And after a few sleepless nights of gazing into the courtyard below and the sky that was darker than it ever is at home, I became intimately familiar with my mental marimba.

This is not a process that I wish to portray lightly. Though the previous sentence may make it sound as if the process of discovery of my mental marimba ended after only a few days, I assure you that I am still discovering it. The imagery of the mind is malleable. It is susceptible to time, circumstance, and emotion. Being in my marimba's presence is a meditation that I do not propose to define rigidly. Every moment I spend with it is new. I would not have described it in these terms at the time, but I was learning to ideate.

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#### **4.1.2 Ideation**

Within the structure of Bonpensiere, success of performance in any task may be succinctly described as 1) the perfection of "V"'s ideation/visualization and 2) the perfection of the release necessary to allow "V2" to function alone. Let us take a moment to more clearly define and understand these two states of being. We will first discuss the meaning of ideation because, in the western world, the concrete work of the mind is a more familiar and safe concept than is the spiritual or emotional release. In ideation, "V"'s only role is to imagine/understand the purpose of physical intent and offer these insights to the expertise of "V2" without distortion.

I am not convinced that there is a wrong way to ideate, granted, intellectual understanding of the situation coupled with personal experience likely makes the process

more effective. However, there is a fundamentality that exists in the concept of creating intentions whether we fully understand how we are to achieve them or not. Basically, it does not matter which path you have taken as long as your ideation sufficiently informs “V2” of its expectations. One concept that has the capability to advance the ease of ideation is the use of a symbolization technique.

One may think of symbolization (or chunking in the terminology of Levitin [8]) as consolidation of information to optimize the metaphorical RAM<sup>2</sup> of the brain. Levitin explains from a neurological point of view:

Remembering music involves setting the neurons that were originally active in the perception of a piece of music back to their original state—reactivating their particular pattern of connectivity, and getting the firing rates as close as possible to their original levels.

He goes on to express that a process such as symbolization allows the unification of individual concepts into a single structure to remember or recall. There are many times that I have associated parts of pieces with certain people. Every time I play them or their melody crosses my mind, I uncontrollably think of that person. My interpretation is undeniably influenced by this and I have often wondered if they were sitting in this practice room next to me, would they recognize that I cannot help but allow their very essence to be the driving force of the auditory moment?

The power of symbolization is fully recognized when one realizes that this process is reversible. Whole sections can be recalled for the performance of “V2” by the recollection of a symbol. For me, this could be using the thought of a person or mathematical progression of patterns as pre-packaged ideation for the performance of a piece of music. There is no limit and no wrong answer to symbols. As long as they fulfill their function to bypass the linguistic process of “V” to store ideation for future

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<sup>2</sup>analogy to Random-Access Memory

use. By doing so, we are streamlining the performance process by translating the entire ideation into the visual, emotional language of the performer “V2”.

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I began to take my music with me everywhere I went. The concept was to live with this piece so that its content fit just as naturally into my life as the mundane events I would fill with it. Evenings would be spent riding busses along the sea overlaying the mental performance of just a few measures or a few beats with the passing rocky beaches. When I no longer felt like sitting, I would wander to some picturesque public space and reside there too. How would this location change my concept of this passage? Those around me had questions, but I lacked the capacity to answer them. Their questions were posed in Italian and my mind was working in the language of marimba. Only the darkened shadows creeping down the folded sheet of paper before me indicated the need to find my way home.

To be clear, I was still not doing this for my love of the marimba. This was another challenge. Another problem to be solved. Another intellectual endeavor I would pursue solely because I did not know whether I could do it. This was a test of my abilities, not a need to express a passion that I was not sure I could still bear to keep. The only disappointment I could foresee in this moment of not completing the concerto was to have found a limitation to my being of which I had not been previously aware.

## **4.2 Rehearsals**

When I made it back to the United States, after traveling for a number of hours I did not care to calculate, the first thing I did (after greeting my parents of course) is greet my marimba, Francisco. He was just as I remembered him though a bit clearer and less

vulnerable to my whim. I unpacked the bag of mallets I had packed two months prior and played. Whether the hours of travelling had worn down my inhibitions I cannot say but the release was immediate. My ideation had built up to the point that my body could not help but finally fulfill the expectations I had meticulously defined. For the extent of the “performance”, I felt no pain. There was no room for it within the processor of my mind. However, it was the precise moment that I realized this absence that the pain became apparent. I had once again made it to this meditative state of performance but this time in a matter of minutes as opposed to hours. I decided that if this was the maximum amount of time I would ever be granted to comfortably play the marimba, I must do it in release. This means that, for me, all learning of notes and rhythms, all dynamics and specific musicality decisions, all ideation must be done away from the marimba.

Honestly, I have found this commitment difficult, stifling and frustrating because the process still does not allow me the rush of vitality as does physically playing the marimba. If marimbas ceased to exist in the world, I would likely not learn music for these methods do not replace physical experiences. However, marimbas do exist and if I am to enjoy playing them once again, these steps of ideation and release are the only way I have found to take me there.

Back in Athens much of my time was spent in the physics building – though in the beginning of my pain I wanted to be near the marimbas that I could not play, I have found that a physical distance is sometimes healthier. I did much of my mental practicing in the physics building, interrupted by problem sets and the occasional physicist wondering why I was staring at a table full of music. The introduction of music into the physics building started some interesting conversations of other peoples’ histories and experiences with the subject. In any case, I found, just as I found in Europe, that changing locations helps to free my mind from a reliance on the delusional protection

and safety of the practice room. By juxtaposing the learning of music with learning that is more likely found in the physics building or elsewhere, the piece found a more organic place in my life...being a part of me instead of a part of a room 3 inches longer than the marimba itself.

I was not nervous to begin rehearsals. By all quantitative standards, I should have been. I had spent cumulatively less than 10 hours behind the marimba (an amount achieved in one or two days in my previous manner of excessive practicing) and the longest I had recently played was less than half the length of the scheduled rehearsal. By themselves, these numbers are not indicative of success. The reason I was not nervous was that I knew the piece. Not in the way that I *used* to know pieces. I knew what was to happen at every instant, what to listen for, who to look at. I had lived with this piece in three countries. I had gotten lost with this piece both literally and metaphorically. With it, I awaited transportation that I was unsure would take me where I wanted to go. All I needed from those 10 hours was to know that my technique had not degraded beyond my capacity to elicit release. Thus, rehearsals became less of a physical challenge and more of a mental rehearsal of release.

Distinctly, I remember the first rehearsal. I was able to play the intended passages with only a few being limited by speed. I am still not sure whether this limitation stemmed from a flaw in the ideational speed/depth or in a legitimate physical limitation. Retrospectively, it is true that I had not fully appreciated the complexity of the passage and its relationship with the flow of time within the ensemble. However, even with the later improvement in the quality of ideation over this passage, speed remained a difficulty. Unfortunately, without the willingness to invest the physical time necessary to push the bpm<sup>3</sup> limitations in the traditional repetitious manner, I cannot say with certainty whether this investment would have been the solution to this challenge.

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<sup>3</sup>beats per minute - a standard measurement of musical tempo

At one point in the rehearsal, I began questioning my understanding of another passage. I want to be clear that I had not, in the literal sense of the term, “forgotten” this section. Instead, after observing a mistake within the rehearsal, I had *decided* that I had forgotten it. As we repeated the section a few times for my sake, I found myself focusing on the (quite unnecessary) embarrassment and (overly sensitive) anger I held for myself for “forgetting” this section. At some point, I just announced it was not going to happen and we should move on. This was an eye-opening example for me of the way that V can inhibit the knowledge of V2. I had, in words, convinced myself that I could no longer perform this passage. From that moment on, it became true. V2 certainly lived up to the degradation that V had imposed. This experience specifically inspired me to spend the rest of the rehearsals discovering methods of release. For, though I love to think and calculate, neither of these actions do I associate with the most invigorating of my performances.

Before I get your hopes up, I assure you that there is no sure-fire checklist for achieving release. None that I have found anyway. There is no amount or quality of words that one could read to learn this skill. But it is the thrill of the chase that makes life exciting on many levels, right? The greatest achievement of words on this subject is thus the ability to inspire and prove a higher potential of personal advance than previously realized.

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#### **4.2.1 Release**

Even more so for release than ideation, one talks about the qualities of its state rather than a series of steps to get there. I propose that we have all experienced a state of release at some point in our lives. The goal then is to more clearly define the state so

that we know when we have gotten there and we may conceptualize our own personal experiments with its acquisition.

The first aspect of release that I will emphasize is a disregard for failure. Some of the most eye-opening examples of this is in the observation of children learning a new task. Their minds, unlike the adult mind when learning new tasks, has little concept of the definition of success or failure in this respect. They do not acknowledge the pressures of a society telling them about the correct or only acceptable manner of performance. In Bonpensiere's example of ideational target practice, he emphasizes this approach to learning as follows:

Let the hands go by themselves and be willing to risk wrong hitting. When you sincerely do not care whether they hit wrongly, but you have a greater regard for your ideation, you save yourself, automatically, from the danger of wrong hitting.

This is the release of efficacy granted to "V2": an amount of trust that "V" must establish as it frees the body from its habitual sense of supervision and control. Thankfully, release is not only defined by a lack of concern for the outcome of performance but a faith in the strength of ideation to be fulfilled more fully by the uninhibited knowledge of "V2". This is not a religious faith. It requires no leap of reasoning. It requires only knowledge of capabilities previously proven to exist. It is in the midst of this faith that we cease to feel weakness. Our sense of efficacy within the world surrounding us is heightened to occasionally contest our intellectual understanding of the laws of nature. Time slows and our actions, though we know them to have been foreign in the past, seem now to be the most natural and honest way we could express ourselves.

To speak further of release would be to misrepresent its place within the self. Its understanding resides in "V2" and thus the essence of its existence cannot be fully captured by the linguistic gymnastics of "V". We will here leave its depiction at

Bonpensiere's simplification that release is "transforming a voluntary motion into an involuntary one"

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The first thing I added to my rehearsal routine was to begin each rehearsal by imagining the hours before the performance as accurately as possible. Most notably was who would be there? Would I greet people I had invited? What would we discuss? Would the discussion be centered around the events of the evening or be just as plausible on another occasion? The point here is to humanize the audience and later visualize them individually experiencing the performance. What is my purpose as the performer? What do I want these people I respect and admire to gain from the next hour? By the time rehearsal had started, I had already created the audience that would observe it. I began to feel at home with these individuals – comfortable with their presence in my world of marimba and percussion ensemble. From a detached point of view, this process should not matter – there should be no correlation between who is sitting in the audience and the quality of performance of which the performer is capable. It is only when we acknowledge that humans are not naturally detached from their world that these correlations become a vital part of the process. The purpose then is not to fight the impact the audience may have on your performance, but to revel in it and appreciate the unique challenges that each person brings to the evening.

The second thing that I consciously added to my rehearsal routine, adding feedback from the body to the mind, became necessary as I came closer to release (or at least my conceptual understanding of release at the time). I began to fear that the high-bandwidth connection between my ideational mind and the actions of my body was not allowing information to travel in the opposite direction from body to mind. I could now cite examples of this in my history in rejecting the notion that pain existed in



my playing, in the painless moments of release after returning to the US, and now in rehearsals. And as desirable as these moments of freedom from the reality of physicality were to me, I decided that a state of delusion was not the state in which I wanted my passions to live.

An aspect of the ecstasy that consumes the performer is described as freedom. And though there have been distinctions placed between “freedom from” and “freedom to”, both are included in these moments. The “freedom to” involves a heightened ability level. The performer may recognize this as the ability to play a passage faster or with more strength and control than had ever been experienced in a “V”-controlled state (see Chapter 3). The realm of possibilities, limited by our known and acknowledged abilities, seems to be expanded. But it is the “freedom from” which is more addicting and more dangerous.

It is the freedom from the rigid physicality of the body that drives the pursuit of release. It is exhilarating to experience such a direct relationship – as if the body which houses the mind ceases to exist and the instrument becomes more of the mental-emotional housing than the tissue and bones to which humanity is bound.

Bonpensiere encourages his readers to “Cultivate the feel of your hands as ethereal agents which can carry out the beauty of your ideation, even if you forget that there is anything physical in them. . . until there is scarcely a trace of feeling about the physical nature of your hands.” With this, he describes a state of the mind superseding the body where the communication between the body and mind is quieted. The mind is free to form ideations at a higher structural level than the body and is able to trust that the functionality exists to make them a reality. This is the habitual task of the programmer who has taken the time and the pains to deeply understand the structure and functionality of the code so that it may later be blindly used as a black box of trusted accuracy. Though one may find peace in the perception of not needing the

constant communication from mind to body, it is the resulting lack in communication from body to mind that incites a level of concern. Because though the body may be able to perform the ideation which has been expressed as valuable, it should be able to reflect and communicate the consequences of this ideation in the process. Only in this way can ideation be knowledgeably designed.

I began adding specific moments in which I would allow the flow of information to reverse. These moments were designated time for my body to report its qualms with the actions that my mind had designed. I am still not sure whether this would be considered an interruption of release. If release is defined as Bonpensiere describes it in the following passage, the answer would have to be yes.

One can speak with authority about release only when the free flow of his ideation finds immediate kinetic realization, without the least preoccupation; when his hands, without the least mental push, go about their business of scrupulous translation, just as though they were not his own hands (when they do not give him the least hint that they are any of his concern)...We ideate our end-results in a process of flow; but, at the same time, we ideate our absolute unconcern with the ways and means to obtain them. [4]

By interrupting this state, I admit that rehearsals were not conducted in one continuous state of release. Instead, they were carried out in pockets of it separated by my volitional concern for the physical integrity of my body. I have often been told of the ideal of balance in life. Maybe (and hopefully?) I will not always need to have this balance and caution when experimenting with release, but for now I do. And, even if I am able to safely neglect it in the future, I propose that the capability of reversing the direction of communication in this way is essential to preventing the perpetuation of unknown or unrealized pain.

### 4.3 The Performance

The night before the performance, I sat in the hall and performed the piece mentally – first from a seat in the audience and next from the center of stage. As usual, I began with the half hour before the performance and placed people in the hall where I presumed they would sit (I was correct about a surprising number of these positions).

My first performance from my place in the audience was not focused on physical details of execution. It was a moment for me to realize exactly what I intended the audience to experience from my performance. I knew they would not know the significance of the evening to me. They would not know that I had not really performed my instrument in what seemed like years or that the ice packs I placed in the freezer tonight would be quite necessary and euphoric afterwards – but I did not want them to know these things. Because, in spite of the consumption that these realizations of the fragility of the body have established in my own life, I refuse to define myself in this way and thus these are not the ideas that I wish to portray. I saw the audience learning what a marimba is, what it can do, and what it means to me. Maybe they would begin to understand why my obsession with the sound and the performance of such an instrument may actually be fully rational. I know that they do not live in my world, but it is this evening that I wish to invite them and share with them a piece of it – a taste that cannot possibly satisfy but creates a sense of intrigue. It is not their intellectual understanding that I am seeking, it is their openness to the validity of this passion.

It was not until I placed myself at the center of the stage and began again that I worked on the physical actions that I would perform – the specifics of the event were the only priority. Now that I had established the emotional state of the audience, I could forget about them. My mind was right where I wanted their emotions to be and

thus the physicality of their presence was no longer necessary. Now, I had only to please myself by achieving the precise goals that I had defined. Reflecting back, these were likely all moments and details that no one in the room knew I cared about. But it is the summation of all these seemingly insignificant details that creates the macroscopic moments I envisioned. As if I had control of the the entire ensemble, I performed the piece – stopping and repeating measures and phrases when necessary. Often, I would switch positions, performing the roto-tom part or the vibraphone part just to experience the connection these players would have with the marimba soloist. In those moments on stage, there was nothing else that existed in my world other than that ensemble. And the fullness of the moment made that world feel complete, saturated by a meaning and wholeness that can sometimes feel so elusive.

My final process of the night was to take a few moments in mental silence to just look at the faces in the audience from stage. It was a silent commitment to these people that my performance was to be one of thoughtful and dedicated admiration for the potential of humanity. It was also a plea for their heightened expectations to push me intellectually and emotionally past my own comfortable familiarity – to teach me. Though we would surely not be thinking about the same things as the evening ensues, the time we would spend together contained the potential for growth on both sides. This silent moment, though short, was important to me. I had never before acknowledged so sincerely the mutual relationship that comes as performer and audience inhabit the same space.

When the night of the performance became the present instead of my envisioned future, there was a sense of familiarity as my visions began to unfold. It was the stability granted by this advanced knowledge that allowed appreciation of the deviations from my expectations – the little surprises and moments for which I had not accounted but would have never noticed had I not so clearly defined my calculations. I may have never

felt quite so aware in my life.

This awareness continued throughout the performance. Though I did not know it in these words at the time, I was experiencing the diminution of time discussed by Gallwey [6]. He discusses how the perception of time is correlated with the resolution of one's perceptive instrument. The smaller your base unit of time advances, the more you may notice and the slower time becomes. Because time is relative and "alertness is a measure of how many nows you are alert to in a given period", we perceive more time when our new sample rate is imposed upon the structure of the old [6]. In the evening of my performance, I was watching myself experience a diminution of time as the resolution of my awareness for the evening had been sharpened by months of visualization. I have honestly never felt more comfortable and alive on stage than I did that evening. I would be interested to know whether the understanding necessary for this sensation could be developed on a much shorter time scale – say, over the course of just weeks or days as opposed to months. This question is the main topic of my ongoing research in this area.

## **4.4 Future**

As I search within my personal history of marimba performance, it is becoming clear that my experiences and personally developed methods are not widely applied or understood. I do not find the same difficulties and obstacles to my performance that others find. Regardless of the subjective perception of positive or negative desirability associated with any of these abnormal methods, it in fact places my accessible range of experiences at a disadvantage and limits the empathetically driven connections that others find within the struggles of their students.

Thus, this is not intended to be a pedagogical document. Instead, it intends to

portray a perspective of marimba performance that is not widely represented. Though I see nothing inhibiting the applications of these perspectives to the lives of any performer I have come across, this is not a how-to guide. For I believe that the only significant step to developing the mind-body relationship previously discussed is awareness of its existence and acknowledgement of its role in the journey of physical performance.

My currently planned future is moving away from the marimba. Now that I know the extent of my capacity to perform with this instrument, I will never be satisfied with the limitations that I have acquired in terms of dysfunctional joints. I feel too young to retire, but I do not intend to continue to dishonor the instrument and community that I love by indecently performing below my previously experienced level of ability. For the moment, my future with the marimba is one of nostalgia and accompanying current performers on their journeys. I look forward to the exciting future that this life-changing and inspiring instrument will find within the lives of today's excellent performers.

## Appendix:

# Theories of Tendinopathy

There are many factors that have been studied as possible causes or significant contributors to tendinopathy. The purpose of this compilation of factors and referenced biochemical changes within tendinopathic tendon is to express the complexity of the situation at hand.

1. Hypoxia: a deprivation of oxygen supply causing degeneration by inhibiting the oxidative energy metabolism within tendon cells [17]
2. Ischemia: When relaxed after a period of maximum tensile load, the tendon releases oxygen free radicals which may be associated with tendon damage [17]
3. TGF- $\beta$ 1 (Transformation Growth Factor  $\beta$ 1) has not only been observed to have increased levels in tendinopathic tendon, but it has been used to **induce tendinopathy** in rats [2]. Difficulties in direct correlation result from the time-dependent levels of TGF- $\beta$ 1 within the adult repair process [14].
4. Excessive tenocyte apoptosis ("programmed cell death"). Both rotator cuff and quadriceps femoris tendinopathies have shown increased rates of apoptosis. Causation is currently theorized to be related to stress-activated protein kinases [17].

5. fluoroquinolones, a class of antibiotics, have been shown to reduce collagen production by altering tenocyte metabolism [17].
6. In animal studies, cytokines and inflammatory prostaglandins have been used to produce a “**histological picture of tendinopathy**” [17].
7. It has been suggested that exercise may raise the temperature of tendon above a temperature suitable for fibroblast activity (remember this is the structure responsible for collagen molecule production). Lesions of degeneration found in tendinopathic tendons have been used as supporting evidence of the involvement of hyperthermia as a possible cause of tendinopathy [9].
8. As all musicians know, technique is important for long-term vitality, especially when repetitive motion for long periods of time is involved. For example, there is a technique in walking called hyperpronation of the foot in which the foot places non-uniform stresses throughout the tendons and ligaments by remaining in a position of excessive inward rotation throughout its movement. It is hypothesized that these types of intrinsic factors such as alignment and biomechanical tendencies are at least partially responsible for two thirds of Achilles tendon tendinopathies (non-mathematical ratio). Though there are unfortunately no such characteristic misalignments yet associated with musical techniques, which more often affect the tendons of the upper extremity, it is likely that they indeed exist. Because any characteristic biomechanical tendency which causes such force imbalances would be extremely instrument-specific, any advances in this theory will likely require close collaboration between the fields of biological sciences and music performance.



| Reported Chemical Level Changes in Tendinopathic Tendon   |   |
|---|---|
| Increased:  | Decreased:  |
| <ul style="list-style-type: none"> <li>▪ Matrix metalloproteinase-2 (MMP-2)</li> <li>▪ MMP-1 (collagenase-1)</li> <li>▪ tissue inhibitor of metalloproteinase-1 (TIMP-1)</li> <li>▪ tenocyte apoptois</li> <li>▪ Prostaglandin E2 (PGE2)</li> <li>▪ Interleukin-6 (IL6)</li> <li>▪ IL-1B</li> <li>▪ mRNA for cyclooxygenase-2</li> <li>▪ MMP-3</li> <li>▪ Twofold increase in lactate levels</li> <li>▪ Glutamate (neurotransmitter)</li> <li>▪ Substance P (functional neurotransmitter)</li> <li>▪ MMP-9 and MMP-13 (between 7-14 days after surgery)</li> <li>▪ MMP-2, MMP-3, MMP-14 (MTI-MMP) (for 28 days post surgery)</li> <li>▪ Nitric oxide</li> <li>▪ Transformation Growth Factor <math>\beta</math>1 (TGF-<math>\beta</math>1)</li> <li>▪ Calcitonin gene-related peptide (CGRP)</li> <li>▪ Peroxiredoxin 5 (associated with theory of oxidative stress)</li> </ul> | <ul style="list-style-type: none"> <li>▪ MMP-3 (stromelysin-1)</li> <li>▪ MMP-2</li> <li>▪ vascular endothelial growth factor (VEGF)</li> </ul> <p>Notice MMP-2 and MMP-3 have been reported to both increase and decrease in tendinopathic tendon. Assuming reliable studies, it is possible that this is indicative of a time-dependent response of these metalloproteinases during the tendon repair process. This table demands that we consider the integrity of tendinopathic tendon to be a function of more than just activity level.</p> |

Table 4.1: Accumulated references from the literature to abnormal chemical levels in tendinopathic tendon. [10, 13, 12, 17, 7, 20, 16, 9, 21, 2]

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