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Applications and Strategies for Relevant and Optimized Training for Mixed Repertoire Dance Companies

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Abstract

The traditional training method for mixed repertoire dance companies consists of a daily classical ballet class regardless of the various styles and physical demands required of the dancers in the repertoire performed. In this thesis, *Applications and Strategies for Relevant and Optimized Training for Mixed Repertoire Dance Companies*, training applications and strategies are researched with the aim to improve the correlation between training in daily class and working demands and to support dancer well-being. The research focused on three highlighted topics where the application and strategies were applied; dance fitness, training principles, and technical style. Applications and strategies for each topic were theorized and trialed during practical work with the dance company of the Oper Graz and with professional dancers during a 5 week working project in Aix-en-Provence, France. Based on feedback, questionnaires and observed effects, the applications and strategies can be said to range in success from promising to unfeasible. The overall result suggests that a progressive training approach for the daily class of company dancers requires specific conditions in order to be applied in a systematic and productive method in which both the dancers and trainers are able to follow a sustainable application.

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1. Introduction: Recognizing the need for adaptation

Our modern world is dynamic and in a state of constant transformation. Societies, cultures, technologies and politics are constantly undergoing change, and with it, so is dance. If we consider professional dance companies of today, we can easily recognize an immense development in recent history. The trend shows a high frequency of performances and an increased diversity of repertoire, demonstrating the growing demand for versatile dancers. By doing so, dance companies require a greater range in the dancer's skills, artistry and physical capabilities. Traditional purist classical ballet companies are rare and the majority of companies are evolving their programing to a range of mixed repertoire from choreographers of a variety of styles.[1] In doing so, it requires that the dancers absorb and become proficient in a new choreographic language for each new production, suggesting that dancers need to be as diverse in their abilities as the repertoire they perform. The question becomes, what implications does this suggest when we are to consider what the training regiment should be? How can the dancer's training best support their progression and well-being? And does a traditional ballet class still offer the most effective form of training or is there a need for an evolved approach to training that corresponds to current choreographic demands?

These questions are the motivation behind this thesis and the research into applications and training strategies for the training of dance companies. Prior to engaging with these questions in a research manor, over the 15 years of my career as a dancer in Canada and Europe, I observed and experienced training that often failed to fulfill its role in supporting the choreography and the dancer's needs. Regardless of the current repertoire or working schedule, the training remained constant in its demand, structure and content. What I perceived were three major compromises associated with this training regime. The first being the lack of correlation between the movement language and skills being used in choreography and that which is trained through ballet. As companies diversify their repertoire, the technique practiced in a ballet class does not address the full range of skills that dancers require. When considered from a sport perspective, physical therapist of the Atlantic Ballet Theater, Mandy Blackmon, described in an interview with *Dance Magazine* the specificity of training for athletes according to skill requirements. "In football, if you're a running back versus a defensive lineman, those players' regimens are going to be very different. Yes, there will be some crossover in terms of

[1] Based on a review of programming from contemporary ballet companies worldwide. A list of the companies reviewed can be found in the appendix.

conditioning and basic training, but the body still needs to be trained for what it is expected to do" (Whittenburg, 2020). If training is given as a traditional ballet class followed by rehearsing a contemporary work, then many relevant movement principles have not been cued in the body. Likewise, taking a contemporary class followed by a rehearsal on point risks that the dancer's body is not appropriately prepared for the specific technique involved. As Blackmon emphasis, the skills needed are not being prepared and trained.

Blackmon's statement also leads us to my second concern that ballet training is not sufficient in training the physical fitness level needed to meet the demands of today's choreography. Dancers use their bodies artistically but also athletically. However, the training which primarily focuses on technical refinement and skill acquisition, fails to target certain aspects of fitness, which when addressed have shown to benefit the dancer's performance and reduce the risk of injuries (Irvine, Redding, & Rafferty, 2011, S. 76).[2] Considering the escalating physical demands of choreography, fitness is becoming increasingly important for dancers. Without a good fitness base, a dancer risks not only injury but also additional stress and anxiety, as demonstrated from the results of the 2005 national inquiry into dancer's health and injury in the UK (Laws, 2005). It is even reported that improved fitness can result in not only better physical performance but contributes to improved aesthetic results as well (Angioi, 2009, S. 115-123). Other important studies have shown that dancers are often not as physically fit as athletes in comparable physically demanding sport (Twitchett, Nevill, Angioi, Koutedakis, & Wyon, 2011, S. 123) which is partly attributed to the structure of ballet training which is composed of short duration exercises purposed to enhance the strength and technical refinement to execute the skills of classical ballet but fails to address the extent of physical demand met by the dancers in performance. The physiological demands of performance have shown to be higher than that of ballet class which was demonstrated in a study conducted by researchers Shantz and Astrand. In their study, the demand on dancers of the *Royal Swedish Ballet* was measured during class, rehearsal and performance. This was done through measurement of the dancer's heart rate, oxygen uptake and blood lactate during these activities. Results showed that the demand from class to performance increased by an average of 50% (Shantz & Astrand, 1984). Additionally, strength and aerobic demands of contemporary repertoire often vary from those of ballet. Researchers Emme Redding and Mathew Wyon

[2] Due to limitations in the German version of the Microsoft word program, all citations including a reference to a page number in this text will appear listed with S. for the German word for page, *Seite*.

published an article in the *Journal of Dance Medicine and Science* in 2007 supporting the need for adaptations to training methods to address the growing demand placed on dancers.

> *"In ballet there seemed to be a marked difference between the demands of class (which have remained the same for decades) and performance, both physiologically and in the diversity of the skills required. Adaptability is a prerequisite for the modern dancer to cope with the different physical and technical demands of different choreographers. However, often rehearsal periods are short and do not allow enough time for the physiological adaptation to take place that would enable the dancer to cope with the increased demands of performance. It might be argued, therefore, that the class may need to be adapted to cope with the increased demands" (Redding & Wyon, 2003, S. 10)*

Despite the research-based support that physical fitness of dancers should be addressed, the methods of training have seen little adaptation in support of the dancer's needs. To achieve better fitness dancers may engage in supplementary training. This can be beneficial but commonly the working schedule is such that there is little time for significant additional training while maintaining a balanced lifestyle (Laws, 2005).[3] For this reason, some researchers support the integration of fitness components into dance training (Simmel, 2014, S. 223), which has the benefit of being directly related to the context of dance and targets appropriate muscle groups and movement patterns. My argument therefore, is that dancers that engage in extra supplementary training outside of their full-time rehearsal and performance schedule are at greater risk of overtraining and disrupting recovery periods and therefore like other researchers advocate (Krasnow, 1997), I suggest that a dancer's training should better encompass their entire training needs within the working time through modified training applications. This leads to my third concern, which encompasses the balance between training, working demands, and rest.

In the science of physical training the importance of rest to allow for adequate recovery is stressed and for professional athletes their training regiments are structured to follow the principles of periodization, meaning a building up and reduction of training prior to high demand events (Bompa, 2009). This strategy has proven to be effective in optimizing performance results. Despite the considerable amount of research from sport and dance science that supports the importance of periodization, in dance companies it remains an under-valued and under-utilized strategy in the structuring of training and the working schedule. A re-prioritization within the theaters planning and organization is required to more effectively follow the principles of training and periodization. Until this occurs, situations of overtraining

[3] Based on the results of a survey with the dancers at the Oper Graz as well as the results of the national inquiry into dancer's health and injury in the UK published in 2005. See reference (Laws, 2005) and survey result analyses found listed under the chapter 7, Data Collection.

will remain, which can lead to reduced performance, changes in mood and depression, fatigue, weight loss, disrupted sleep patterns, loss in muscle strength, and increased resting heart rate (Koutedakis & Sharp, 1999). All of which have been associated with increased risk of injury. To avoid the risk of overtraining, burnout and injuries, my third suggestion is to implement training principles based on periodization by strategically planning training and respecting the need for rest and recovery.

These three topics became the foundation for this research topic and are summarized in the following statement. In response to the growing choreographic demand placed on professional dancers in mixed-repertoire dance companies, the training requires an adapted approach to address increased physiological demands, the diversity of choreographic languages and the balance between working demand and rest. Addressing these three major topics of stylistic requirements, physical fitness and regulating working intensity, is an enormous task with considerable variabilities. In my research I aimed to address these topics through training applications that I assessed during practical working experiences with the dancers of the Oper Graz during a 3-month period in 2020 and a 2-month period in 2021. Additional research was carried out with bachelor students in the dance program of the Anton Bruckner Privat Universität Linz as well as over a 6-week period with 3 professional dancers during a work project in Aix-en-Provence, France. This practical work allowed for the theories and ideas of this research to be tested out and provide feedback, data, and reflections to the work which over the period of my research, continued to adapt in the aim of improving the applications and strategies.

In this thesis the information and research will be presented in the following chapters. In chapter 2, *The Role of Training*, the purpose of the daily training will be discussed as an introduction to further understanding and support for this research. In chapter 3, *Harmonizing Technical Training*, the applications for developing greater correlation of the style and skills practiced in training to those needed for choreography will be discussed. This is followed by chapter 4, *Conditioning and Fitness in Dance*, and chapter 5, *Aerobic Fitness Integration*. These chapters discuss the integration of physical fitness components in the daily dance training and the practical research conducted on aerobic fitness strategies conducted with bachelor students. In Chapter 6, *Training Principles*, strategies for planning and balancing working demands and rest will be discussed. In chapter 7, *Practical Trials at the Oper Graz*, the applications and strategies from the previous chapters are examined in a practical setting. Following this time at the Oper Graz, the applications relating to harmonizing techniques were reflected upon and developed through a new approach. This work will be discussed in chapter

8, *Bridging Movement Practices*. To conclude this thesis, chapter 9, *Reflections and Conclusion*, will discuss the viability of this research and offer suggestions for applying this work and pose questions where further research is still essential in the pursuit of this thesis topic

2. The Role of Training: its importance with evolving choreography

A dancer's training typically comes in the form of a dance class, where movement exercises develop the skills and condition that dancers require for the dance form they work in. For mixed repertoire dance companies this remains predominantly a classical ballet. The daily class is a complex component to the dancer's work and has the capacity to impact the remainder of the working day. The class is valued for many contributions to the dancer's development and serves many roles beyond technical and physical development. According to the authors of *Safe Dance Practice*[4], the class consists of 3 principal components; learning, training and practice (Quin, Rafferty, & Tomlinson, 2015). Practice according to researcher Jeffery Ives[5] is, "dedicated effort towards improving upon a skill or task" (Ives, 2014, S. 192). Ives explains that within the component of practice, the body exercises the refining of movement pathways and skills. This task of revisiting movement is also essential as the body is in constant change. The cells of our body, which together form tissue groups such as our muscles, connective tissues and bones, undergo adaptation and regeneration at different rates (Simmel, 2014, S. 8), thereby re-execution of movement serves to re-establish our motor skills and deepen our kinaesthetic memory. Kinaesthetic memory is a branch of our kinaesthetic knowledge which we build through motor sensations in our body (Bolens, 2012, S. 2-3). This corporal intelligence underlines our practiced physical motions and calling upon it is another aspect to our practice of movement. By doing so, neurological connections between sensory and cognitive function are strengthened (Haas J. G., 2018, S. 15-18), which gives rise to the body mind connection and motor control capabilities.

By comparison Ives differentiates that training involves the improvement of physiological function, which leads to proficiency of motor skills and abilities. This improvement occurs through attention to the physical condition of the body which is determined through the aspects of physical fitness. Fitness in the context of dance is regarded under the categories; cardiorespiratory fitness (aerobic and anaerobic), muscular flexibility and joint mobility, neuromuscular coordination and proprioception, muscular strength and power, and rest (Irvine, Redding, & Rafferty, 2011, S. 2). The training principles that guide these

[4] Edel Quin; Sonia Rafferty; Charlotte Tomlinson, Safe Dance Practice, Champaign, IL, USA, Human Kinetics (2015) pg. 107-108. The literature provides research-based information to leading a safe dance practice. Chapter 6, *Sequencing and Progression*, discusses the content and focal aims of training in dance practices.
[5] Jeffery Ives is a professor for the department of exercise sport sciences at the Ithaca university in New York, USA. His book is a practical guide to understanding motor behaviour and learning in application to sport training.

individual categories and the degree to which they are addressed in traditional training methods varies. This has led some researchers to support the integration of fitness training into the context of dance training, that are otherwise neglected (Redding & Wyon, 2003). Training fitness within a dance class is also shown to be beneficial for its relatability, thereby it is easily transposed to dance (Wyon, 2005). How fitness training within the context of a dance class will be discussed in greater detail in the chapter 4. Dancers however, train more than physical fitness. The training also needs to address other aspects and skills used in dance such as; musicality, stylistic and artistic qualities, and cognitive decision making in situations of spatial relation to the space itself and other dancers.

The aspect of *learning* is then regarded as the way in which motor skills are learned (Quin, Rafferty, & Tomlinson, 2015), and concerns itself with skill acquisition. Although within a professional company the dancers have achieved a high level of skill acquisition through pre-professional training as students, the level of demand and skill set requirement as a professional dancer still presents new learning aspects through a greater variety and difficulty of skills. These three components of the class; practice, training and learning, co-exist within the structure, content, and execution of the training and act together as the preparation for the working day and for the demands the body is subject to encounter. Therefore, while considering these components of the training an overall harmony should be achieved and it is said that, "The individual session needs to be balanced, but it also needs to be seen in context with other activities so that the overall demands are not excessive." (Quin, Rafferty, & Tomlinson, 2015, S. 109). Other roles of the daily training include building a sense of unity in the group. As dance companies often work in divided rehearsals, the class may be the only time in a working day when the dancers are all together. While this may not be considered in the same value as the physical work of the training, it contributes to building the relationship of the dancers and to the working climate of the group. Additionally, the daily training serves as a mental preparation. Arriving into the studio and tuning into one's body and mind is a part of the dancer's training and results in the mental focus and engagement required for the act of learning and recall. It also mimics

Role of Daily Training Highlighted

- **Learn**: skill acquisition
- **Practice**: re-train movement pathways
- **Train**: physiological adaptation
- and improvement
- **Preparation**: matching contextual demands
- **Mental engagment**
- **Build unity**

Figure 1: Role of Daily Training. Created by the author

the preparation and attention needed before engaging in higher stress situations such as performance (Quin, Rafferty, & Tomlinson, 2015, S. 61).

When we zoom out and observe all of the roles the daily training plays, we note that it has a complex task list. It holds the responsibility of many jobs but too often does not meet the requirements of all of them and striking a balance between all these components poses a great challenge. The question remains, how can the training include elements of fitness and correlate to the style and skills required later of the dancers? How can the training remain relevant to the choreographic demands?

It is standard for company dancers to begin their working day with an obligatory group training session, which in the culture of mixed repertoire dance companies remains primarily to be a classical ballet class. This however, is beginning to be challenged by individuals who are questioning the significance of the ballet class as the primary training method. This arises from the recognition of a lack of correlation between ballet class and the performed repertoire. Rehearsal director of *Ballet British Columbia,* Lara Barclay is quoted questioning the appropriateness of ballet training to prepare dancers to be able to achieve choreographer's aims,

> *"Undoing patterns in order to get to that place a choreographer seeks is so important, and that undoing, learning how to move in a different way, is also part of your training. If you give a dancer ballet 5 days a week, can they find that?" (Whittenburg, 2020)*

Barclay's statement alone is subjective but researchers Allen and Wyon explain in an article for *Sport Ex Medicine*, a significant factor contributing to dancer's condition due to training methods. Allen and Wyon explain that dancers have exceptional movement economy due to high repetition in training. This high efficiency in practiced skills results in an under stimulus contributing to relatively low physical fitness levels compared with athletes. They also explain that dancer's highly refined technique protects them while performing the skills practiced through repetitive training, but underlying strength and endurance to safely attempt skills outside of their normal practice, may not be sufficient in unfamiliar movement situations (Allen & Wyon, 2008). It can therefore be argued that both to promote injury prevention as well as preparing dancers for the choreographic diversity they will encounter, training should expand its range in technique and skills trained. To understand deeper the disparity between skills practiced in training and choreography, we should first understand, what skills do today's dancers need to fulfil the demands of the repertoire?

2.1 The needs of today's dancers in mixed repertoire companies

This question is difficult to answer as the skill set and demands placed on dancers is constantly in fluctuation. With each new choreographic work, there can be expected a new movement vocabulary and new physical skills required. In the course of a single season the demands on the dancer will vary and greater from one season to the next and one company from another. Co-Author of *The Body Eclectic*, Melanie Bales, describes that dancers must overcome this through the development of kinaesthetic dexterity, a term describing the versatility as a dancer to hone various techniques and movement styles. (Bales & Nettl-Fiol, 2008). This diversity and range in kinaesthetic knowledge stems from a rich training experience and working within different technical forms, movement languages and aesthetics. Dancers must continue to build from this platform of experience and knowledge to allow for further adaptability. In doing so, they develop greater precision and accuracy. As each choreographer sets forth with their unique style, the dancers may also confront new challenges artistically, physically, and mentally. The choreographic process along with the performative conditions themselves may present the dancers in new terrain such as performing in water, incorporating spoken text, or using physical skills from areas such as circus, as examples[6]. The dancer is no longer bound to the format of one technique fits all and the skill set becomes a juggling act of various stage disciplines. Given the nature of all the variety today's dancers encounter, it becomes a daunting task to decisively say, what training and preparation would best support the development of their kinaesthetic dexterity.

If one trains solely in ballet technique, several considerations arise. By focusing on a singular technical form, training other technical forms becomes non-existent and skills that are not practiced in ballet are left untrained. I refer to the previous mentioned article from Allen and Wyon that suggest that this leaves dancers in a rehearsal process vulnerable to injury when unpractised skills are called upon (Allen & Wyon, 2008, S. 6-9). It has been my experience as a dancer that when unpractised technical skills were encountered, that rehearsal time was utilized to practice aspects of the movement that otherwise would be ground work within the

[6] Alexander Ekman's 2014 creation *A Swan Lake* for Dan Norske Opera & Ballett was staged with dancers performing in a lake on stage. https://alexekman.com/swan-lake/
Choreographer Sidi Larbi Cherkaoui regularly incorporates text on stage in combination with movement as in *Stoic* created for Göteborgs Opern Danskompani in 2018 https://www.opera.se/en/dance/repertoire/stoic/
Stephan Thoss's creation Reve for Les Grands Ballets Canadians in 2013 incorporated a scene with a dancer hanging from a rigging system over the stage while performing choreography upside down. https://grandsballets.com/en/performances/detail/dream-away/

technical training and *Netherlands Dance Theatre* director Emily Molnor is quoted expressing her concern with the readiness of dancers in various choreographic situations,

> *"How do you take ballet and Gaga and put those together. How do you couple Flying Low with Improvisation Technologies? How do you create a diverse training opportunity for the artists so that, when they are in conversation with a maker, that they have all of these tools in their toolbox that they can access?" (Whittenburg, 2020)*

Some examples of skills that are not practiced in ballet training include; falling, moving down to and up from the floor, floorwork, female partnering, improvisation and inversions. These skills are often a part of contemporary training and like the skills within ballet, also require practice to safely execute. Another consideration arises from the fitness demands of choreography compared to ballet training. Traditional training methods primarily fail to achieve aerobic conditions due to their start and stop nature. As a result, professional dancers are often reported to have low levels of aerobic capacity compared to athletes performing in comparably demanding sport disciplines (Twitchett, Neville, Koutedakis, Wyon, & Angioni, 2011). But in performance, dancers are often required to dance continuously for longer durations, thereby engaging the aerobic and anaerobic system, demonstrating the importance for improving the aerobic capacity of dancers. Increased levels of aerobic fitness have been proven to increase endurance, reduce recovery time, reduce the risk of injury, stimulate the immune system, and improve productivity through increased endurance of concentration (Simmel, 2014, S. 223). Other aspects of the dancer's fitness such as strength and power are being trained in classical ballet but not always to the specific needs of the choreographic demands. For example, classical ballet training fails to address upper body strength needed for floor work, weight barring and partnering and with choreographic developments including such elements and skills, a greater occurrence of upper body injuries has resulted (Quin, Rafferty, & Tomlinson, 2015, S. 50).

2.2 Relationship of the training to the choreographic result

Beyond technical and fitness aspects, training only in classical ballet leaves the dancers at a disadvantage in the variety of movement languages they have readily accessible. In an interview with *Dance Magazine*, dancer Jermain Spivey of *Cullberg Ballet* and *Kidd Pivot* described his experience,

> *"It felt frustrating to take a ballet class and then go learn something by Sidi Larbi Cherkaoui that asked me to be fully supple, give into the floor, turn into a pretzel and stand back up again*

all in 1 count, when the first 90 minutes of the day hadn't preprepared me for that." (Wittenburg, Why Do Mixed-Rep Companies Still Rely on Ballet for Company Class?, 2020)

The body is the main instrument of a dancer's craft, and they wield it in choreographed movements by engaging different embodiments through various interpretive gestures. These gestures have been analytically studied by movement researchers and predominantly from dance theorist Rudolf Laban who developed the *Laban Movement Analysis*, a system for deciphering movements of the body through the categories of Body, Effort, Shape and Space. Effort in particular creates the vast spectrum of qualities that movement can have through categorization of the effort factors; space, weight, time, and flow (Dell, 1977). This analysis enabled Laban to develop clear understanding to the factors that form the textures, tones, and qualities that give each movement their character and elevates movements from a purely kinetic execution into artistic expression. Artistic development is a part of the dancer's training and aids the dancers to have a greater readiness for the artistic challenges they will be presented with in the choreographic process. Historically ballet companies have categorized their dancers according to their physical and artistic characteristic in a term from French theater emploi. Emploi was developed in 1785 as a means to settle debates between artists in the right to perform certain roles. This was later replaced with the modern day approach of casting (Wikipedia, 2023). Artistic director of Arizona Ballet, IB Andersen in speaking about casting explains that each dancer is individual and has specific traits and skills which make them better suited for certain roles. Andersen explains that many factors are considered when casting a dancer in a role, including physical stature, dancing capabilities and strengths, point in the dancer's career and stress resilience. (Ballet Arizona). Andersen advocates for fair casting, explaining the importance to promote development in a dancer through a variety of casting opportunities but typecasting exists in the dance world and dance writers, Stephanie Lawton and Khayla Jordan Golucke suggest dancers should embrace this (Lawton, 2018) (Golucke, 2022). However, typecasting sets limitations on dancer's opportunities. As companies program with greater and greater diversity, dancers pursue to increase their versatility to gain experience and opportunities in the growing range of choreographic languages. The training, when it offers a greater range of movement principals presented in diverse settings, creates an opportunity for the dancer to develop artistic areas beyond their individual strengths. Many dance programs recognize the growing range today's dancers require for their career and are already diversifying to include a wider scope of courses such as Embodied Africanist Aesthetic, Kathak and Butoh (Marymount Manhatten College, 2022). Companies who do not follow this

progressive approach may find their performative results suffer. Dancer Jermain Spivey again shared his experience in witnessing the results of dance companies with undiversified training situations, “What I see is homogenized movement, not because of what they are trying to do, but because of how they’re working” (Whittenburg, 2020) As an example of this, I refer again to co-author of *The Body Eclectic*, Melanie Bales, who in viewing an *American Ballet Theater* performance of a Twyla Thwarp program, gave her opinion to the interpretation of the leading artists. While she found certain dancers to excel in the Thwarp movement language, others failed to achieve the essence of the movement quality.

> *“…he didn’t quite get it right, and it was in the body attitude… I saw too much formality in that crucial area of the body, so that the Tharpian juxtaposition of haute-technique combined with casual offhandedness was missing.” (Bales & Nettl-Fiol, 2008, S. 160).*

When the dancer’s training offer is limited, the development of various body attitudes, as Bales refers to it, will also be limited. So how should a dancer who has Ohad Naharin in their repertoire and the next week Nutcracker, be given the opportunity to train diversly and be able to adapt and embody the repertoire to their fullest?

2.3 Training specificity

To the previous question, the answer again is not so simple. In sport science there is a recognized value in training specificity which means that physiological responses resulting from a given set of exercises, directly corelates to the physiological requirements involved with managing the specific stress load of performance (Paul Gamble, 2006, S. 54). Returning to physical therapist Mandy Blackman’s earlier statement that football player’s training is constructed for the specific skill asset of the players positions, we have to consider, how can we compensate for the fact that the dancer is both the running back and defensive lineman in different choreographies throughout the season? How can the training regimen support the specific needs of the dancers within the diversity of their work? Swiss dancer, sport scientist, movement coach and founder of the Franklin method, Eric Franklin, sees the value in specifying training to the performative movement and approaches this from a dance sensible perspective. In his book, *Conditioning for Dance*, Franklin describes training specificity and promotes using similar movements in exercises to those being executed in performance. He describes this in two ways; the conditioning for specific muscular groups, in coordinated movement patterns and in the style and technical execution (Franklin E. , 2004, S. 2-4). This approach, if implemented over long term, suggests that training should be adaptive and

responsive to the choreographic demands. This also requires a great ongoing consideration and evaluation of those demands in order to target specific training needs. Does this suggest that training in classical ballet has lost certain value and hold over training hierarchy in the light of the progression of programming?

2.4 Continued relevance of ballet training

Despite the insufficiencies of the ballet training in addressing the entirety of the training needs of today's dancers, it remains a valuable training form for many reasons. The benefit of the classical ballet training is that inspires motor control refinement and detailed technical study which Ballet British Columbia rehearsal director Lara Barclay explains, offers consistency in the structure and skills trained within a working day otherwise filled with developing and learning of choreography (Wittenburg, 2020). Although the repertoire of companies has diversified, there remains no simple substitute. Contemporary training can be problematic that its flexible structure with various teaching approaches and aims, can also leave the dancers missing a balanced regiment. The struggle for today's dancers is the incredible range of the work they perform, from truly classical repertoire to cutting edge contemporary works. To remove ballet training would leave the dancer's technique vulnerable and their performance would suffer. For many contemporary choreographers such as David Dawson, Christian Spuck, Julian Nunes, Cathy Marston and Wayne Mcgregor[7], the classical form continues to be relevant for them. They may draw from neoclassical inspirations or combine their contemporary approach with movement language of a classical origin to form their specific movement language. William Forsythe is quoted in an interview with *The Gaurdian*.

> *"It's ballet's politics that are of another era, not the form itself. Ballet is like the alphabet. It's like saying there is no more writing after Shakespeare. He used letters from the alphabet and words that were made with letters. The alphabet of ballet is eternal – you just have to use it." (Crompton, 2022).*

[7] This selection of current choreographers and their work offers an example of choreography being created with a strong focus on classical ballet technique. David Dawson was resident choreographer with Dresden Semperoper, The Dutch National Ballet, and The Royal Ballet of Flanders. Christian Spuck is current artistic director of Staatsballett Berlin and his narrative and abstract ballets have been performed worldwide. Brazilian born, Julian Nunes, creates works for some of the world's most prominent dance companies. Cathy Marston is newly appointed director at the Zürich Ballett and her choreography has been performed by many leading companies. Wayne McGregor is the founder of Random Dance Company and his choreography has world renowned acclaim.
Dawson: https://en.wikipedia.org/wiki/David_Dawson_(choreographer)
Spuck: http://www.christianspuck.com
Nunes: https://www.ndt.nl/en/team/juliano-nunes/
Marston: https://www.cathymarston.com
McGregor: https://waynemcgregor.com/about/wayne-mcgregor

As Forsythe suggests, the language of ballet is not a museum piece. Ballet in both choreography and training has an essential and relevant place in today's dance companies. Ballet training's structure and content appears drastically different to that of other dance forms but underlaying movement principles of classical ballet are shared in other technical practices creating a powerful connectivity in movement over genres which will be discussed in chapters 3 and 8. These movement principles are not always highlighted within the instruction of classical ballet, however, we need only to consider the oppositional energies within the body required for arabesque to understand that we utilize these principles whether in contemporary or ballet. Training these movement principles from another perspective such as in contemporary training, can also benefit the dancer's ballet technique when these principles are better understood and connections between training forms are established. Which is one reason why certain dance companies are starting to branch out in their training offer.

2.5 Diversified training

In recent years, a shift has started to take hold, where companies are recognizing the need to diversify their training if they want their dancers to be as diverse as the repertoire they are programming. Ballet British Columbia is a leading mixed repertoire company, presenting progressive programming involving a wide range of movement techniques. To meet their needs, they have been offering contemporary and ballet training, but additionally they have also introduced other movement practices such as Feldenkrais, contact improvisation, Gaga technique and workshops with local indigenous movement practitioners (Whittenburg, 2020). Choreographer Trisha Brown was even known to seek dancers who were able to liberate themselves from trained habits. To free themselves from certain affectations that result in a trace of the technique attached to the bodies movement executions (Bales & Nettl-Fiol, 2008, S. 160). Despite this view, we could also consider that rather than a total undoing of patterns, we can seek to find a balance between technical forms and strengthen certain patterns that in fact support the dancer in their ability to connect together technical forms. In doing so, we reduce the distance between one movement form from another and start to view all movement languages as being held within the same knowledge library, ready to exchange and inform each other. It was with this theory in mind that I developed an application of harmonizing classical ballet and contemporary training. The theories and applications of this harmonized approach to training will be discussed in the following chapter.

3. Harmonizing Technical Training: an application for contemporary and classical ballet

In the last chapter we investigated the role of the daily training for dancers in mixed repertoire companies and we started to understand both the possible benefits and hinderances to training the dancers exclusively with a classical ballet class. We also discussed the benefit of training specificity and the increasing need for a diversified training offer. In this chapter an application to diversify the artistic, qualitative and skill development of dancers through a harmonized approach from ballet and contemporary techniques will be presented.

3.1 A comparison of the approach of ballet and contemporary technical training

The approaches of ballet and contemporary training vary greatly and seem to be in contrast to one another but because of this they can be used to create balance. Classical ballet has evolved throughout history from its beginnings as 17th century court dance into today's globally established art form. Ballet continues to be shaped by the most predominant technical systems of training; the French technique, the Russian technique of Vaganova, the Danish Bournanville technique, the Italian technique of Cecchetti, the English RAD technique and the American Balanchine technique (Fournier, 2018). Each training system places specific importance on aspects of the training giving them their notable styles but all hold in common the values of the technical aims, in particular the outward rotated placement of the legs, grace and artistry in the use of port de bras, musicality reflected in the quality of the movement, and extreme control of the body (Anderson, 1992). Ballet technique has a reductionist approach, meaning through highly developed motor control skills extraneous movements are reduced to produce fluidity, precision and an elegant carriage of the body. Specialized skills attributed to ballet training such as virtuosic jumps, turns, and sustained extensions are executed with the pursuit of appearing effortless. Ballet master Enrico Cecchetti was quoted describing the aims of ballet technique, re-enforcing the ideals established throughout the lineage of tradition,

> *"Aim at softness and ease in your performance of a dance. Endeavor that all shall be harmonious. However hard your work at your lessons or rehearsals, let none of this effort be visible in your performance. There must be no sign of concentration, exertion, or tension. All must be free and natural. For the true art is that which conceals the labour that produced it." (Macias, 2012)*

The earliest codification of the form of ballet was written in the 19th century in Carlo Blasis's *Traité élémentaire, théorique et pratique de l'art de la danse* (Blasis, 1820). As a master teacher his teaching insisted on technical and stylistic traits in a form that continues to be represented in today's ballet training as demonstrated through his 1828 publication, *The Code of Terpsichore*[8], "Take special care to acquire perpendicularity and an exact equilibrium. In your performance be correct, and very precise; in your steps, brilliant and light; in every attitude, natural and elegant." (Anderson, 1992, S. 96). Ballet training has continued to evolve over centuries as classical choreographers seek greater virtuosity but the highly codified training remains focused on skill acquisition and artistic development (Redding E. , 2009).

Contemporary dance, in comparison with ballet, is in its infancy and currently faces the dilemma of being clearly defined as a form. The 20th century saw choreographers breaking away from the classical genre with the rise of modern dance. Unlike ballet which follows an agreed upon and shared underlining technique, modern dance techniques were developed specialized to the choreographic interests of early pioneers such as Martha Graham, Doris Humphrey, José Limón, and Merce Cunningham. Early modern dance took a strong contrast to ballet with clear angular movements, strong physicality of the body as well as a grounded movement quality omitting delicate ornamentation of gestures (Anderson, 1992). Post-modern dance in the 1960s further challenged established ideas about what accounts as dance, technique and training, creating a culture of "eclectic training" that situationally reflected individual choreographers while rejecting the idea of a centralized training that addresses all choreographic needs (Bales & Nettl-Fiol, 2008, S. 31). The emergence of the term contemporary dance appeared in the establishing of the London School of Contemporary Dance in 1966 and the London Contemporary Dance Theater in 1977. The school was largely inspired by the work of Martha Graham but soon followed the next generation of choreographers developing contemporary technique in various directions (Anderson, 1992). Influences from cross culture references also became prevalent, such as with Akrahm Kahn's hybrid approach between traditional Kathka and contemporary dance and these new fusion forms pushed to expand the understanding of what encapsulates contemporary dance (Redding E. , 2009). In recent history, contemporary dance has continued to expand in its form resulting in an abundance of newly developed techniques such as Release technique, Counter technique, and Flying Low, among others. In 2010 Tanzplan Deutschland addressed the question, how

[8] Carlo Blasis's, *The Code of Terpsichore* 1828 was translated into English by R. Barton and published in 1975 in New York by Dance Horizons publishing as referenced in author Jack Anderson's 1992 second edition of Ballet and Modern Dance: A Concise History.

can contemporary technique be defined? Recognizing the multitude of contemporary styles which in turn shaped various training methods and techniques, the three year research project compares the technical training of seven post-secondary dance training institutions to serve as a model for practical and theoretical education in contemporary dance (Diehl & Lampert, 2011). Training in contemporary ranges from codified techniques, practicing specific movement skills often within a set structure of exercises such as with Graham technique, to non-codified, based heavily in movement principles without a set movement vocabulary. Today's dancers, according to the range of movement languages and creative processes of choreographers, require training in both (Redding E. , 2009). In Redding's doctoral work she highlights a commonly used structure for a contemporary dance class, containing 3 main segments; a warm up portion focused on building co-ordination and technical aspects such as alignment and body awareness through practicing of typical skills such as floor work, balances, successive articulations, and sustained extensions. Followed by the main body of the class which trains greater co-ordination and memory in longer movement sequences combining a variety of skills together, and the final portion engages the dancers with greater negotiation of dynamics and weight transfer by using traveling combinations that include prior practiced skills as well virtuosic elements. Susan Foster[9] in a 2011 interview comments on virtuosity in dance stating,

> *"I think that part of what is seen as virtuosity today has become versatility: dancers are expected to be knowledgeable about a lot of different genres and styles and this is today a part of virtuosity. But underlying that, standard assumptions of virtuosity are still operative which have to do with the way you can balance, the way you can extend your legs, how high you can leap, in what kind of daunting way you can fall, etc. – with how you can put your body in a precarious situation on stage and at the same time overcome this precarious situation. Virtuosity has been defined differently in different times and places and for different forms of dance" (Foster, 2011).*

Fosters comment re-enforces the diversity of the movements skills and styles of today's dancers, which echoes late contemporary dancer Gill Clarke's comments at the Dance UK's Healthier Dancer Program conference in 2006 in England, suggesting that no one set of skills for today's dancers will prepare them for all the needs they will encounter and that an openness and adaptability are as essential skills to those of their movement vocabulary (Redding E. , 2009). Openness and adaptability, like other skills are encountered and practiced within contemporary training. An exemplary model is the contemporary dance classes offered at the

[9] Susan Foster is a professor at UCLA for the department of World Arts and Cultures/Dance, as well as choreographer and acclaimed author of many dance publications specializing in dance theory.

P.A.R.T.S. School of Contemporary Dance in Brussels. P.A.R.T.S. implements a diverse training of a range of movement skills including; floorwork, contact and partnering as well as improvisation, in an environment of experimentation aimed at developing individualism and expanding movement patterning (P.A.R.T.S.). This approach exemplifies the contrasting nature of contemporary and ballet training which we can summarize as follows. Contemporary dance classes train dancers through an expansive approach in the range of techniques practiced, both codified and non-codified. Non-codified techniques particularly focus on discovery and experimentation within movement principles and the development of the individual through agency and greater awareness of one's body. This exploration of embodied possibilities gives space for discoveries and growth of the individual artist. Contrastingly ballet classes only use a codified training system based on a lineage of tradition in pursuit of precision and accuracy through highly developed motor skills and reducing extraneous effort while expressing an aesthetic of elegance and resilience, through composed artistical displays of virtuosic skills. These contrasting approaches appear in opposition yet dancers have started to uncover the balancing effects that cross-technical training offers them such as; motoric solutions in various movement approaches and a greater range in skill acquisition, thereby demonstrating the symbiotic relationship between ballet and contemporary techniques (Bales & Nettl-Fiol, 2008, S. 19). Considering this beneficial relationship, we will discuss the theories and applications of a harmonized approach to technical training.

3.2 What does it mean to harmonize contemporary and ballet technique?

Harmonizing contemporary and ballet technique is an application developed on theorizations that the two technical forms compliment and support the dancer to develop a greater diversity when these two forms are brought into connection and practice with each other, thereby exchanging knowledge and removing barriers separating them. Associate director of the Julliard School in New York, Mario Zambrano shares how the school similarly searches for a method to bring the technical forms they offer into connection.

> *"I think we'll continue to offer students Limón and Taylor and Graham and Gaga and William Forsythe's Improvisation Technologies, but we're trying not to refer to them as 'patches in a quilt' anymore. They're more like threads in the same fabric, all speaking to each other in so many ways" (Wittenburg, 2020).*

The term harmonizing was selected based on its unifying properties. Harmonizing is defined as bringing two different things into accordance, as in voices in different octaves

singing together to create a pleasant tone together, or as in politics, bringing laws of different countries into similar standards and agreement (Collins English Dictionary, 2010). We can view techniques similarly in that they are governed by their own set of laws to serve the purpose of their form but by harmonizing the techniques, it suggests that these underlining laws or principles will be viewed in alignment with one another and remove possible hierarchical perception.

The goals of harmonization are to build supportive connections between the techniques and create a fluid exchange of knowledge, as well as to increase the awareness of shared principles and offer strategies for problem solving for the dancer when facing challenges in movement execution. It has the possibility to offer greater consistency in the overall approach to the training by removing barriers and isolation around the techniques and by bringing forth principles and ideas from both into regular practice. This is with the overarching aim to increase the adaptability of the dancers by having both techniques and artistic qualities of these forms prepared and on hand as tools within choreographic contexts. Melanie Bales, co-author of the book, *The Body Eclectic*, expresses her views on interconnectivity between training and choreography,

> *"I find that by examining some aspects of how dancers train – since often the training is the medium through which movement ideas are born, transmitted, and transformed – movement can be identified as a conveyor of meaning and placed in relationship to other parts of the whole" (Bales & Nettl-Fiol, 2008, S. 10).*

Bales views training and choreography in a holistic relationship and further that training is a developmental aspect to movement later finding a place within choreography, but further that all aspects are interrelated arguing against certain notions within the context of dance culture that dismantle relationships between technical forms. This view is taking hold as the new envisionment of training for dancers starts to become established through further developments in training offers.

3.3 A strategy for harmonization

As contemporary dance grows in popularity, certain fusion contemporary ballet classes are becoming more prevalent. Chapman University in California is one example and offers contemporary ballet classes led by founding director of New York based Complexions Dance Company, Dwight Rhoden. Professor and chair of the dance department at Chapman University, Julianne O'Brien comments in an interview with Dance Magazine on the positive

benefit to the dancer's movement and approach to the work, "It's been wonderful for our students - the shifts of weight, the musicality, the co-ordination – not just for the bodies but for their brains" (Ziv, 2023). O'Brien stresses that dance genres should not be isolated and that individualism should flourish if dancers are to have the readiness in professional contexts that choreographers seek. Contemporary ballet classes as a fusion form may offer students a preview for future creative processes but in the context of a professional mixed repertoire company a greater balance in technical training is required to maintain the elite quality of technique for *La Bayadère* one evening and Damien Jalet's *Skid*[10] the next. Harmonization is designed therefore with a flexible structure that allows it to retain a relationship to current demands. This is done by varying the degree of integration of technical principles from ballet and contemporary. This fluid approach uses variance to the content to cater to the needs of the current choreography. To define this flexibility, a classification assists in targeting the content and focus of each individual class. The following are the classifications used in this application. A class that is presented as **(B)** represents a traditional classical ballet training, **(B-c)** being classical training with contemporary adaptations and principles, **(C/B)** being a balance between ballet and contemporary technique both in movement vocabulary and technical principles, **(C-b)** being contemporary training with adaptations from classical technique and principles, and **(C)** being an entirely contemporary training. The design of the classification is to orient the content of the class but is not regulated by a fixed syllabus of exercises or movement vocabulary, meaning it is shaped by the instructor of the class.

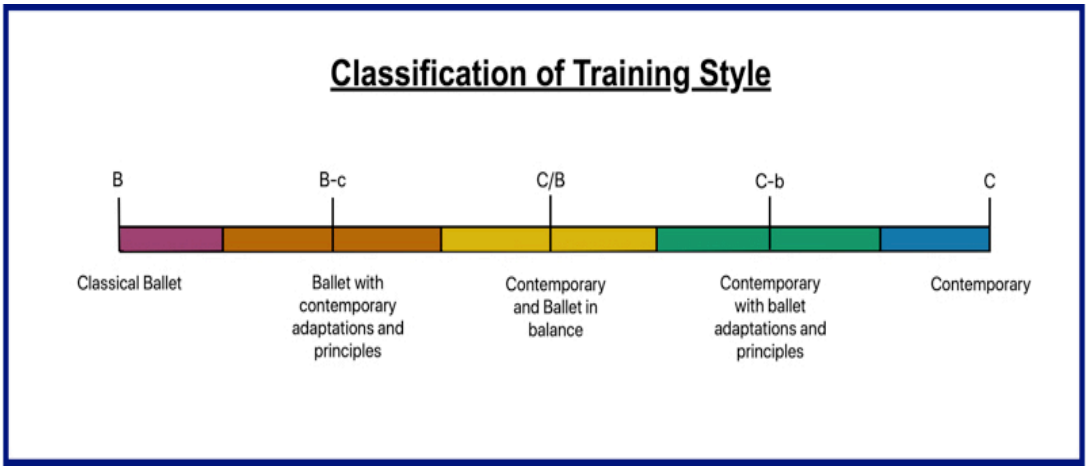

Figure 3: Classification system of training styles from ballet and contemporary technique. Created by the author.

[10] Acclaimed French Belgium contemporary choreographer Damien Jalet is creator of the dance performance Skid performed on a 34 degree angled dance platform on which dancers climb, slide and partner with one another. https://damienjalet.com/project/skid/

3.4 Structure and applications

The framework of the class remains in the structure of a classical ballet class, working progressively through warm up and preparatory exercises, followed by centre work that accumulates in large full range movement including jumps, before the conclusion of the training with cooling down. This maintains a familiar structure to the class. As the typical structure of a ballet class begins with exercises at the *barre*, this too applies to this application as the classification ranges in the direction of ballet. Contemporary training however, may begin with warm up exercises in the centre, either standing or on the floor. The more the classification ranges towards contemporary technique, the class will not necessarily contain preparatory exercises at the *barre*.

The applications to harmonize are greatly linked to similar training methods developed by Anna Paskevska, author of the book *Ballet Beyond Tradition*. Paskevska developed her pedagogical approach after her perception of ballet was re-formed with her introduction to modern dance as an adult. Paskevska recognized that the training of ballet was no longer in rhythm to the evolving choreographic styles of the times but that ballet in itself still held great value.

> *"It is precisely because ballet training is so focused on the practice of a specific physical vocabulary that the quality and dynamics of the movements can be somewhat obscured. In this context, the Limón concepts point the way to reconnect ballet training to a more thoughtful physicality because they address the quality of the gesture yet, when understood as concepts, can be abstracted and even modified from their specific stylistic application, and therefore serve more directly our understanding of ballet technique." (Paskevska A. , 2005, S. 4-5)*

Paskevska worked with students at the Chicago Academy of the Arts and Columbia College, applying knowledge of movement principles of Limón technique into the context of classical ballet training. In harmonizing techniques, we use Paskevska's approach to guide dancers through exercises using dictated vocabulary connecting ballet and contemporary. Paskevska uses specific vocabulary associated with Limón technique for movements in exercises triggering a shift in the dancer's perception to develop a richer movement quality and technical understanding.

> *"These concepts offer the opportunity to think of the technique in different terms, to change the words and ideas used to impart the intent of the technique, and to encourage students to perceive movement from a deeper and truer (in terms of the physicality of the technique) perspective" (Paskevska A. , 2005, S. 3).*

As an example of this, rather than saying *chassé*, the dancers are guided to slide through a deep second position (use of succession), releasing the weight down through the floor and connectively pushing the floor to lengthen into recovery (use of opposition). In this example, the descriptive vocabulary triggers a response to connect the dancer's knowledge of contemporary movement principles while performing a movement from ballet.

In harmonizing techniques, the movement content serves as another application. Movement or skills from both ballet and contemporary genres can be brought together within the same exercises. Similar to the recent spread of contemporary ballet classes, dancers are encouraged to search for a balance between the techniques and movements can be informed by the principles of both forms. Certain movement vocabulary and skills are shared between both ballet and contemporary although the quality and tonality of the vocabulary can vary greatly and within the context of the training is addressed for the desired qualitative approach and as such offers the possibility for creativity within constructing and shaping the content.

The application of harmonizing follows greatly that of Paskevska's work, but opposed to a unilateral application, as with Paskevska using modern principles in a ballet context, harmonizing is a bilateral transfer, using the technique and principles of contemporary and ballet in exchange. This puts the principles of contemporary and ballet into a symbiotic relationship of cross application.

Harmonizing primarily differs from contemporary ballet classes in that rather than attempting a fusion of dance genres, the techniques maintain their distinct qualities and benefits but serve to assist the growth and development of the dancer. To summarize, harmonizing techniques uses the following applications; the vocabulary used to dictate and instruct movements, shared content of movement skills and vocabulary, emphasis on movement principles creating motoric solutions, and strategical application in consideration with current choreographic demands. This application to the training will be discussed further in the context of the practical work conducted with the dance company of the Oper Graz in chapter 7. Another aspect of a dancers training to be placed in balance is the physical conditioning of the body and will be discussed in the following chapter.

4. Conditioning and Fitness in Dance

In the previous chapter, the strategies of harmonizing techniques and its applications were discussed. Now, continuing along the mandate of optimizing the training for dancers in mixed repertoire companies, the topic of conditioning and fitness for dance and its integration into the daily training will be presented. The importance of a dancer's health and wellbeing will also be discussed and how they are directly connected to the dancer's overall fitness. Then the areas of fitness applications and strategies will be examined alongside with a presentation of aerobic training trials that were carried out with bachelor students of the Anton Bruckner Privat Universität. These applications were also set into practice as a part of the research with the Oper Graz which will be discussed in chapter 7.

4.1 Health and well-being

What do we mean when we speak about health? According to the World Health Organization, "health is the state of physical, mental and social well-being…" (WHO, 2023), and is not limited to but includes being free of disease and injury. For dancers, their physical condition or their physical fitness is a major aspect to their overall well-being. A dancer's body is their tool, and therefore its maintenance and condition directly affect their performance capacity, giving reason for health and wellness to be top priorities to theatres and artistic teams. One leading example is the Royal Ballet in London which employes a team of 17 sport scientists and healthcare specialists working with the dancers in injury prevention by using sate of the art technology to assess workload stress on the body and developing personalized conditioning regimes to support the dancer's performance and longevity of their career (Bailey, 2018). Without healthy dancers the entire working environment is affected, productivity decreases, stress and anxiety increase and a healthy working environment can quickly turn negative (Laws, 2005). This has been associated with a higher occurrence of injury (Patterson, Smith, Everett, & Ptacek, 1998)[11]. However, health is a broad encompassing topic which is influenced by a large number of intrinsic and extrinsic factors such as age, gender, genetics, fitness, lifestyle, environmental conditions, physical stresses, illness and disease, and quality of life. While it is important to mention all aspects of health in order to consider the multitude

[11] From the university of Washington, a study of professional ballet dancers in southwestern USA, where stress was found to be connected to a higher rate of injury and psychological factors attributed to higher injury incidence in professional ballet dancers.

of factors that contribute to the health of the dancer, for the purposes of this thesis the health components of fitness and rest in relation to the daily training will be in focus.

A healthy dancer is an injury free dancer. Having an injury can be devastating on a dancer's career. It has been reported that 85% of ballet dancers experience an injury over a one-year period (Twitchett, et al., 2010, S. 26)[12]. Although not all injuries may be serious or long term, all injuries create a change in the working situation of the company. In 2017 the Australian Dance Council, Ausdance National and The University of Sydney published *The Safe Dance Report IV,* an investigation into injuries of professional dancers working in Australia. The investigations found that 16.2% of injuries led to a complete pause in dance during recovery. Looking at recovery times of all dance related injuries, the investigation found that 42.7% required 1 week before a full return to dancing, 20.7% required 1-3 weeks, 25.6% required 1-3 months and 7.3% of injuries required more than 3 months recovery time (Vassallo, 2017, S. 14-15). As one dancer needs to rest and rehabilitate, commonly another dancer or several dancers are shifted to cover the role of the injured dancer. This can affect the working environment caused by psychological factors such as anxiety and stress for both the injured dancer and the entire team, which has also been linked to increased injury occurrence (Mainwaring, Krasnow, & Kerr, 2001, S. 105-112). No matter the circumstance, whether preparing for performance or or in daily class, injury prevention should be an integral part of the working practice. Many factors interact and contribute to injury such as insufficient rest, poor nutrition, inadequate hydration, workplace conditions, improper or insufficient warm up and cool-down, composition of training, demands of rehearsal and performance, and inadequate fitness level (Laws, 2005). When it comes to injury prevention, dancers can help protect themselves by establishing a good level of fitness that will support them through their working day as well as in recovery (Starr & Keller, 2020). But research shows that many dancers could use improvement within their fitness level to match the demands of their work (Irvine, Redding, & Rafferty, 2011) Contributing in part to this result is training dancers in traditional methods which fail to target all aspects of fitness but rather give priority to technical development and skill acquisition. The majority of dance classes are defined as being high intensity intermittent exercise due to their start and stop structure (Wyon, 2005) which fails to match the cardiorespiratory demands of performance. A dancer is likely to spend only approximately 50% of the training in physical motion, while the remainder of the time they are

[12] The research of Twitchett, Brodrick, Neville, Koutedakis, Angioni and Wyon investigated injury occurrence in elite vocational ballet students. Reported insufficient condition and low aerobic capacity resulted in significant injuries over a 15-week period.

static in-between exercises (Simmel, 2014). It has also been reported that 85% of dance training falls below the cardiorespiratory level of that which is required in performance (Quin, Rafferty, & Tomlinson, 2015, S. 77). As it is reported that dancers with lower cardiorespiratory capacity experience a higher incident of injury, greater importance should be placed on training cardiorespiratory fitness to both reduce injury and help dancers to meet the demands of performance (Twitchett, et al., 2010). Understanding the different components of fitness and how they can be trained effectively is essential to supporting the dancers in their health and physical well-being.

4.2 Components of physical fitness and integration strategies

Physical fitness according to the authors of *Human Kinetics*, is defined as the capacity of the body systems to efficiently work together to sustain one's health and execute the physical activities of daily living. Efficiency is performing these activities with minimal effort (Corbin & Masurier, 2022). Adequate fitness for a professional dancer then requires that they are able to perform their work efficiently without excessive strain and remain free of injury and illness. The physical nature of a dancer's work suggests that their fitness level should be comparable to that of athletes who perform similar levels of physical exertion. However, dancers tend to be not as fit as their athletic counterparts. Traditional ballet classes utilize high volume of repetition for skill specific precision to develop efficiency and technical accuracy, lacking attention on a well-rounded base of strength and physical condition (Allen & Wyon, 2008). Depending on the specific requirements of the current repertoire, dancer's may rely on certain aspects of their fitness greater than others, but research promotes addressing all relatable areas of fitness to ensure the dancers maintain a balanced physical fitness (Irvine, Redding, & Rafferty, 2011, S. 2). Fitness in the context of dance comprises of the following categories; cardiorespiratory fitness, muscular flexibility and joint mobility, neuromuscular coordination and proprioception, muscular strength and power, and rest (Quin, Rafferty, & Tomlinson, 2015, S. 77). Each of these components play a role in the overall fitness of the dancer and affects their ability to perform optimally. Each of these components have specific traits, means of training, and require different levels of physical exertion in training and attention in training planning is needed to maintain a balanced workload. To address this, a system of categorizing training intensity is used to ensure effective integration of fitness components coordinated with appropriate times within the working schedule.

4.3 Training intensity levels, traits and content

Every physical activity, from sleeping to fast running, requires energy but the intensity and energetic demand of activities vary. Sport and performance psychologist Dr. Jim Taylor, explains intensity as the physiological experience that can be measured through adrenaline production, rate of respiration, and heart rate[13]. Taylor explains that activities with fast and powerful bursts of energy are of higher intensity than activities involving fine motor skills or endurance (Taylor, 2009). Activities are typically categorized into 3 intensity levels defined by their metabolic rate. The U.S. Department of Health and Human Services published a document in 1999 outlining examples of activities according to their intensity level. Light intensity is defined as activities requiring less than 3.5 calories per minute, such as easy walking, light biking, stretching, and sitting. Moderate activities such as brisk walking, hiking, yoga, moderate biking, low impact aerobics, or weight training, require between 3.5 to 7 calories per minute. Vigorous intensity activities require more than 7 calories per minute, such as running, fast biking, high impact aerobics, and circuit weight training (U.S Department of Health and Human Services, 1999). For this application all training intensity is divided into a range of intensity from 1 to 4 to greater define the range of intensity experienced through various training aims. Level 1 is the lowest intensity and intended primarily as a recovery and warm up preparation, level 2 is moderate intensity, level 3 is high intensity training, and level 4 is the maximum training intensity. Each of these levels correspond to different components of fitness training and will be discussed further below. The grading of the intensity level is to be shared with the dancers prior to training sessions, allowing them to better prepare themselves by knowing what to expect from the training for each day of the work week. The table below is a visual depiction of the intensity levels of the training, followed by traits and content of each intensity level.

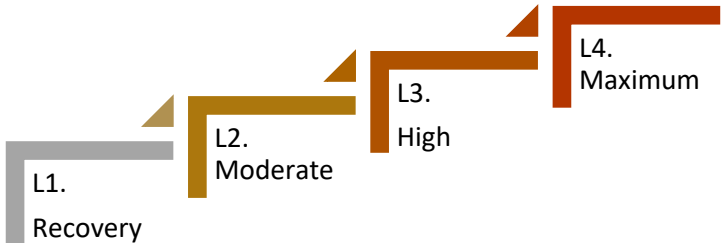

Figure 5: Training intensity titled from L1-L4 in graphic. Created by the author.

[13] Former associate professor of Nova University and University of Denver, Dr. Jim Taylor is a sport and performance psychologist who consults international athletes and has worked with Miami City Ballet and Hartford Ballet Company.

The table below arranges the traits and content of each training level. As certain fitness categories require greater or lesser exertion in training, they are planned within the appropriate training levels ranging from L1 to L4.

Training Intensity - Traits and Content			
L1 Recovery	**L2 Moderate**	**L3 High**	**L4 Maximum**
Lowest energy output	Moderate energy output	High energy output	Maximum energy output
Recovery and base level training	Moderately challenging	Challenging	Very challenging
Focus: proprioception, neuromuscular coordination, flexibility	Focus: moderate strength training, conditioning	Focus: aerobic and strength training	Focus: anaerobic and power strength training
High volume of incorporated rest	Well incorporated rest	Moderate incorporated rest. Minimal rest during aerobic training	Moderate short duration active rest

Figure 6: Traits and content relating to each training intensity level. Created by the author.

Looking at each training level, level 1 includes neuromuscular coordination and proprioceptive training as well as flexibility due to their low energetic demand. Level 2 primarily includes moderate strength training and conditioning. Level 3 targets aerobic fitness and strength training where exertion demands are still well below maximum and Level 4 is reserved for high intensity training involving the anaerobic system for cardiovascular and power strength training. Level 4 training should be the most demanding energetically and needs to be planned to not coincide with a high demand work load the day before or day of. Categorizing training within a dance class means there will be inevitable crossovers from other fitness aspects that occur in the regular content of the exercises, but the primary focus of each training level becomes the aim of those training sessions. The following descriptions of each area of fitness aims to clarify their purpose within a dance context and provide strategies for integration.

4.4 Muscular flexibility and joint mobility

Flexibility and mobility are an essential part of a dancer's fitness. They aid in efficiency of movement and coordination, balance the effects of strength training, help prevent injuries through the ease created by range of motion and reducing compensation in other areas of the body (Quin, Rafferty, & Tomlinson, 2015, S. 82). It is also an area of fitness that many dancers

focus on regularly but its capacity is largely determined by the body's genetic composition and other factors such as age and gender. "Of the factors that limit range of motion, only 10% are muscular related; 85% are joint related, which is mostly hereditary, and the remaining 5% are due to other factors such as age, sex, and environmental temperature." (Dieghan, 2005, S. 13-17). This is not to suggest that improvement of flexibility is not possible but the limit of the joint structure will determine, to a great extent, the degree of range of motion capable. Franklin Method developer, Eric Franklin describes flexibility in the body in two ways, static and dynamic. Static flexibility is the range of motion available while performing a non-moving stretch which is determined primarily from the range of the specific joints, the capacity of the muscle tissue to elongate and the elasticity of connective tissue. Whereas dynamic flexibility refers to the range of motion capable while in motion, which may differ to static flexibility. (Franklin E. , 2012, S. 50-51) The amount of stretch provided through muscular elongation, then becomes the target for improvement through appropriate stretching and mobilization techniques. However, the type and timing of stretching is often misguided. There are 3 commonly used forms of stretching; static stretching is performed without movement, dynamic stretching gradually increases movement until full range of motion is reached, and proprioceptive neuromuscular facilitation or PNF alternates between contraction and release to elongate muscle fibres (Quin, Rafferty, & Tomlinson, 2015). PNF stretching is reported to have the greatest gains in flexibility and requires fully warmed muscle tissue to reduce risk of injury (Hindle, Whitcomb, Briggs, & Hong, 2012). Likewise, static stretching should only be performed when the body is warm and fully ready. Only dynamic stretching can be performed when the body has not reached its fully prepared state. Sometimes static stretching is included within a warm up portion of the training but in this case the stretch should be maintained for a maximum of 10 seconds and be performed only when the heart rate has been raised to a minimum of 50% heart rate maximum or HR_{max}[14] (Quin, Rafferty, & Tomlinson, 2015).

For the purposes of this application the focus is on the integration of stretching as a mode of recovery and injury prevention. It is utilized as short duration stretching (5-6 secs) between exercises as a quick reset for the muscle and a combination of PNF and static stretching as an element of the cool down portion of training. Post training, rehearsal or performance cool down is often undervalued, in particular when it falls into the dancer's private time. But it has been reported that dancers that complete a cool down, experience fewer injuries, recover faster, and

[14] HR_{max} is the shorthand form of heart rate maximum, meaning the maximum beats per minute for a given individual before severe health risk occurs. This shorthand will be used throughout the remainder of this text.

experience less delayed onset muscle soreness (Laws, 2005). To encourage a healthy practice of post activity cool down, its importance should be stressed as well as integrated to the ending of the daily training. The following strategies aim to increase awareness and good practices of stretching to support flexibility and healthy joint mobility.

4.5 Flexibility integration strategies

1. Choreographing short duration stretches to the end of exercises

- Ex: Calf stretching after *petit battement* or *relevé* exercises to reset the muscles (Wyon, 2010).
- Control the short duration of the stretch by using musical phrasing.

2. Cool down

- After Grand Allegro conclude the class with a moving *port de bras* that continues to reduce the heart rate (HR)[15] as well as mobilize the joints.
- End sequence by leading into both guided and free stretching

3. Reinforce the value of warming up and cooling down

- Warm up by increasing the HR to 50% HR_{max}, mobilize the joints, dynamic stretching and minimal short duration static stretching (Quin, Rafferty, & Tomlinson, 2015).
- Cool down by reducing the HR through reduced intensity movements, mobilize the joints, static stretching to recover muscles or PNF to aim for improved flexibility (Ibid).

4.6 Neuromuscular coordination and proprioception

Another aspect of fitness for dancers is neuromuscular coordination and proprioception, which address balance, agility, coordination, body awareness and stability (Irvine, Redding, & Rafferty, 2011). The ability of a dancer to control movements with a variety of qualities and dynamics is due to the involvement of passive and dynamic stability. Dynamic stability is particularly important as it provides the ability to sustain smooth and controlled movements with accuracy (Phillips, 2005). It is suggested that as choreographic demands increase, an increase of a dancer's range of motion is required, making stability essential in preventing injury (Quin, Rafferty, & Tomlinson, 2015). The variety of choreographic languages also demands heightened capacity of the dancer's proprioception. Scientist and creator of the

[15] HR is the shorthand form of heart rate and will be used throughout the remainder of this text.

Feldenkrais Method, Moshé Feldenkrais worked to reduce extraneous effort and improve body alignment in movement. He recognized that in order to distinguish between small changes in the body, overall effort must be reduced. “More delicate and improved control of movement is possible only through the increase of sensitivity, through greater ability to sense differences.” (Feldenkrais, 1972, S. 52) Which he said was developed by one’s time and attention dedicated to the practice of differentiating, achieved through perceiving our sensation and awareness of the body. The training of neuromuscular coordination focuses on motor learning which employs various muscle groups coordinated with minimized effort to shape and control the skeleton. Proprioception branches from kinaesthesia, which is viewed as the 6th sense of the body, where sensations are perceived both consciously and sub-consciously. For author and researcher Carrie Noland, kinaesthesia, “refers to the sensations of movement, transmitted to the mind from the nerves of the muscular, tendinous, and articular systems.” (Noland, 2009)[16] Our proprioception is commonly refered to as the awareness of our body in space in relation to its parts. Combined with neuromuscular control, proprioception develops the precision of a moving body in space. This area of fitness is a highly necessary skill for dancers in problem solving. As the body experiences small changes from day to day, utilising the same strategies and effort every day is less successful than adapting to the conditions of the body and the work on any given day. Israeli choreographer and instructor based in New York, Zvi Gotheiner, suggests, “Replace control by consciousness.” (Franklin E. , 2012, S. 17) to create pro-active and relevant solutions in technical development which are only possible through heightened awareness of the changes of the body in connective movement, suggesting that a more sensitive approach through heightened development of a dancer’s proprioception offers better developmental results than pure muscular strength alone. Through traditional forms of training, neuromuscular coordination and proprioception are being developed but specific strategies to enhance the dancer’s awareness with training and practice are explained below.

4.7 Neuromuscular coordination and proprioceptive integration strategies

1. Proprioceptive training incorporated in class

- Balance on flat foot, close the eyes and strive to remain in balance. Progress to a balance on demi point and on one foot (Batson, 2018).

[16] Carrie Noland is a professor at the University of California with research interest in performative arts and author of *Agency and Embodiment*.

- Perform a simple portion of an exercises at the barre with eyes closed. Cue the dancers to sense where different parts of their body are in space. Adapted from suggestions in the book, *Safe Dance Practice* (Quin, Rafferty, & Tomlinson, 2015)
- Work facing away from the mirror.
- Perform a moving sequence then suddenly stop in a balanced position (Ibid).
- Have dancers mirror the movement of a fellow dancer or practice group exercises using leading and following with improvised movement (Ibid).

2. Use of imagery and visualization techniques

- Mentally use pictures and words to affect the sensations in the body, stimulating the ability to differentiate qualities and tonality (Franklin E. , 2012)
- Visualizing yourself dancing an exercise, sequence of movement, or specific skill the way you want to physically execute it. (Haas J. G., 2018) While visualizing, sense how the movement feels. Kinesthetic simulations will occur and aid to develop deeper understanding of the movements. (Bolens, 2012)

3. Stabilization

- Combine *Pilates* and other stabilization specific exercises within contemporary floor warm up sequences, within targeted exercises or as a transition between barre and centre work in a ballet class.
- During the *barre* exercises, incorporate stabilization exercises performed standing on one foot while drawing a pattern in the air with the opposite foot or moving between standing to airplane position as in warrior 3 in yoga practice.
- Work to maintain balance in a held position while changing eye focus to different directions, such as from right to left (Haas J. G., 2018).

4.8 Muscular strength and power

For dancers, good strength fitness offers many benefits. Studies have shown that strength training can reduce the incidence of injury (Howse & McCormack, 2009) and can also reduce pain associated from dancing (Kline, Krauss, Maher, & Qu, 2013). Muscular strength and power training to a certain degree are already integrated into the exercises of regular dance classes but ensuring effective results and the targeting of specific muscle groups can be achieved through supplementary training or incorporating strength specific exercises into the dance classes. Researchers Koutedakis and Sharp define muscular strength in two ways. It is

the maximum force that can be generated for a single muscular contraction (Koutedakis & Sharp, 1999) and additionally in terms of endurance, meaning the resilience to the onset of fatigue over the duration of engagement (Starr A. , 2016, S. 38). Whereas, when speaking about muscular power it refers to the explosive force applied to muscular strength. In a dance setting, muscular strength is involved to varying degrees in all our movements, such as supporting our body or lifting our limbs. Power is then applied within specific movement actions where speed and explosive initiation is required, such as in jumps, fast dynamic movements, and overhead partnered lifts. The following strategies offer ways to integrate strength training within a dance class.

4.9 Strength fitness integration strategies

1. Increase the volume of pre-existing strengthening components of the class
    - *Adagio* work, utilizing slow and sustained actions in a greater volume
    - Increase repetitive muscular work by increasing volume of repetitions of specific movements, as example; extensions, *relevé, grand plie, grand battement*.

2. Include a component of partnering work
    - Target upper body strengthening through supporting a partner's weight, lifting, and receiving weight.

3. Use gravity resistance
    - Floor barre work
    - Contemporary floor work
    - Moving down to and up from the floor

4. Integration of resistance and weight training
    - Add *Theraband* resistance to the barre portion of the class for specific exercises (Haas J. G., 2018)
    - Wear ankle or wrist weights during barre exercises for greater recruitment of the core, back and arm muscles. By holding a weight further from the center of the mass, the difficulty to sustain the muscular contraction increases (Todd, 1937).

5. Integration of traditional strengthening and conditioning exercises
    - Plyometric, squats, core training, push ups (Haas J. G., 2018)
    - Include components from yoga or Pilates.

4.10 Cardiovascular fitness (aerobic and anaerobic)

Cardiorespiratory fitness provides the body with endurance. Researcher Liane Simmel defines endurance as the, "resilience to fatigue: the slower a dancer tires, the better the stamina" (Simmel, 2014, S. 219). Simmel describes the benefits of cardiorespiratory fitness to include faster recovery rate, reduced risk of injury, and improved health through stimulating the immune system. Additionally, when the aerobic energy system is trained, the heart is strengthened and increases in size, enabling for a greater volume of blood to be circulated through the body and therefore delivering a greater oxygen supply on demand (Haas J. G., 2018). So long as muscles are able to receive adequate oxygen, they are able to continue working for longer durations due to the high production of adenosine triphosphate (ATP), which acts as the energy supplier for our body. ATP is produced for the body in two ways; aerobically, involving oxygen, and anaerobically, without oxygen. Which form of ATP production is used, depends on the situation of the demand. During low intensity, longer duration activity the body will rely primarily on aerobic production which is favourable for its high energy yield and mild waste production of water and carbon dioxide. Whereby the production of ATP through the anaerobic system utilises carbohydrates and delivers energy more rapidly than the aerobic system. Its disadvantages are its low energy yield, it produces lactic acid as a waste bi-product and it has a short duration capacity (Simmel, 2014). For a dancer, both energy systems are essential. While individual quick explosive movements will call the anaerobic system into action, over the span of a choreography the reliance upon the aerobic system is great to provide continual and enduring energy supply. In the case of a class or rehearsal situation, the aerobic system may rarely by engaged due to the stop start nature, but a dancer with greater aerobic capacity will fatigue slower and recover faster, making the value of aerobic training beneficial in all working situations.

4.11 Aerobic fitness

Training the aerobic and anaerobic systems have different requirements and methods. Each will be examined separately beginning with the aerobic system. Training the aerobic system can be done at a lower or higher intensity. Low intensity aerobic training requires the heart rate to remain within the range of 40-59% HR_{max} for a minimum of 30 minutes. Higher intensity aerobic training requires 60-90% HR_{max} for a minimum 20 minutes duration (Wyon, 2005). Traditional aerobic training methods include; running, aerobics class, swimming, cycling, or jump rope but now some researchers are supporting the use of integrated aerobic

training within a dance setting (Rodrigues-Krause, et al., 2014). In order for dancers to achieve the conditions of aerobic fitness within a dance training session, there are two major hurdles to overcome, the high frequency and lengthy pauses that occur, causing variation in the heart rate, and maintaining an intensity level that does not exceed the intensity demands of aerobic conditions. The following strategies offer solutions to incorporating aerobic training within a dance class setting.

4.12 Aerobic fitness integration strategies

1. Increased proportion of centre exercises and *petit allegro* training linked together with a moving transition

- Exercises should include simple and repetitive movements where the focus is emphasised on staying active rather than technical refinement.
- Exercises are performed with reduced intensity to stay within the target hear rate range and avoiding arm movements above heart level.
- Requires preparation by repetition of the same exercises over several days to establish memory of sequences to be performed for a longer duration without pause.

2. Connecting the exercises at the barre together in a long 20-30min sequence

- Remove pauses and connect exercises with a moving port de bras and temps lie sequence (Simmel, 2014).
- High volume of repetition and simple exercise construction.
- Requires preparation by repetition of the barre exercises over multiple days to memorize the sequences.

3. Guide a 20 min active improvisation in a contemporary training session

- Dictate and direct the movement quality, range, movement in space, intensity and volume.
- Emphasis continual movement at a moderate intensity
- Discourage explosive movement such as jumps, moving down to and up from the floor or sudden increase in dynamics which trigger the anaerobic system.

4. Connect across the floor and centre combinations in a contemporary training session

- Structure across the floor work that is repetitive element based rather than combinations of movement.
- Incorporate light jogging from one side of the room to return to repeat.

- Multiple repetitions for each movement element Requires preparation by repetition of movements and sequences for familiarity and to ensure avoiding pauses.

Following the next section on anaerobic fitness, a case study that examined such strategies for aerobic fitness with the dance bachelor students of the IDA program at Anton Bruckner Private Universität will be presented.

4.13 Anaerobic fitness

Anaerobic fitness is essential to dancers, for its capability to supply energy for high intensity movements such as; explosive jumps, high agility movement sequences, and fast full ranged movements. But the low efficiency to produce ATP and the production of lactic acid means that muscles quickly experience fatigue, resulting in a slowness to respond. (Simmel, 2014, S. 219-221). Training targeting the anaerobic fitness is suggested after an aerobic fitness base has been established as it's higher heart rate zone and higher energetic demand should be supported by a strong base of aerobic fitness for effective recovery (Wyon, 2005). Training requires the use of maximum effort with a 1 to 3 work/rest ratio (Irvine, Redding, & Rafferty, 2011). Classic examples of anaerobic fitness include; sprint running, quick step training, tuck jumps, and fast skip rope. Traditional dance training methods already utilize this fitness component but to further the dancer's anaerobic capacity it has been suggested that dancers should engage in interval training and later develop to training using High Intensity Interval Training (H.I.I.T) (Quin, Rafferty, & Tomlinson, 2015). H.I.I.T. training requires high intensity movement for up to 30 seconds followed by an active rest period before repeating. The active rest aids in recovery by keeping the volume of blood flow high, aiding in the removal of lactic acid from the bloodstream and therefore reducing the impact of delayed onset muscle soreness (Wyon, 2005). The following strategies offer ways to integrate anaerobic targeted training within a dance training setting.

4.14 Anaerobic integration strategies

1. Utilize H.I.I.T training through allegro work

- High intensity exercise of jumps and fast movements traveling through the room using maximum effort for 30 seconds (Quin, Rafferty, & Tomlinson, 2015).
- Follow with walking and a moving port de bras or light jogging through the room before repeating.
- Work up the number of repetitions over several training sessions.

- Similarly, create a combination (up to 30 seconds) using movements going down to and up from the floor in rapid succession combined with jumping, as is common in contemporary training. Follow the same moving recover before repeating.

2. Plyometric (Jump) Training

- Engage in plyometric training only following a positive assessment of muscular stability for the hip, knee, and ankle through a single legged demi plié while maintaining proper tracking alignment (Ibid).
- Complete repetitions of jumps that target maximum elevation for a duration of 20-30 seconds with active break periods between repetitions.

3. Incorporate high volume of explosive movements within combinations

- *Grand battements*, large jumps, and fast, high-intensity movement sequences
- Utilize maximum effort for short periods followed by active recovery rest.

Having examined each component of fitness and possible integration strategies, our understanding for the need of good planning to balance all training aims is apparent. To not over or under load the dancer's training, the various fitness aspects need to be targeted over several days. We also notice that the integration of aerobic fitness becomes challenging as it requires a certain amount of preparation to allow for its continual execution without pause. In the following chapter this will be examined further, looking at a specific strategy aimed for realistic application for professional dance companies.

5. Aerobic Fitness Integration: Practical research on integrating aerobic training with bachelor students of the Anton Bruckner Privatuniversität

The following chapter reviews the try outs of an aerobic training strategy that was developed with the intention to be utilized by professional dance companies but could be applied for pre-professional dancers as well. The strategy aims to balance the necessary requirements of daily training while meeting the conditions of aerobic fitness training. This means a training that can meet the various needs of the dancers such as a proper warm up, well rounded technical training, and well-structured class material. As described in chapter 4, training the body's aerobic system requires specific conditions to achieve an aerobic experience. Researcher Matthew Wyon, suggests that an aerobic foundation,

> *"is a vital aspect to all training programs as it exposes the body to continuous moderate intensity exercise for a prolonged period of time, that promotes general conditioning for the dancer. The format of the training can either be specific (dance movements) or general (circuit training), but the intensity needs to be between 60%to 85% of an individual's maximal aerobic power (VO2max), 70% to90% HRmax or 14 to 17 rate of perceived exertion (RPE)42 continuously. The duration of the training sessions should between 20 to 40 minutes" (Wyon, 2005).*

Wyon continuous by suggesting that for dancers a greater benefit comes through using dance specific movement and recommends lengthening the center work of the dance class with removed breaks, while maintain the focus on the training effect as opposed to movement execution to ensure the targeted effect. Wyon also mentions that any movement or activity, so long as it falls into the necessary conditions, can create an aerobic experience, but in utilizing movement specificity, other peripheral benefits can be achieved for the muscle groups involved.

In February 2021 during a 1-week period of contemporary training given to the 3rd year bachelor students at the Anton Bruckner Privat Universität, the aerobic training was carried out over three days (10.12.2021-12.02.2021). On day 1, training strategy was explained and the exercises were learned. Day 2 consisted of reviewing the exercises and adding moving transitions to connect the exercises. On the final day, the aerobic training session was conducted and exercises were connected by moving transitions for continuous movement for the duration of the training. Due to the covid-19 pandemic regulations the 3rd year bachelors had been pre-divided by the overseeing professor into 2 groups and will be referred to as group A and group B. On the 1st day, both group A and B learnt the following exercises.

Warm up exercises:

1. mobilization and roll downs
2. floor warm up

Aerobic exercises:

1. plié and tendu with transfer of weight
2. feet and *jeté*
3. body swings and *Chassé*
4. triplet, leg swings and side traveling.

The remaining jump exercises were not instructed in the 1st day and were given to both groups on the 2nd day as well as the transitions, which were then integrated and practiced at the end of the exercises. In the 1st two days, the main purpose being learning and reviewing was successful in that the students, through their feedback, stated that they felt they knew the combinations fairly well and could manage to follow the class structure with the aid of vocal cueing and visual cueing that was posted in the studio on day 3.

Another important part of the preparation was practicing measuring the heart rate and using the heart rate target zones as a comparison to give the students an aim to regulating their effort output. The measuring of the heart rate was done simply by counting the pulse taken at the neck for a period of 15 seconds, which was then compared to the heart rate values for the aerobic heart rate zone based on their age group. There are several variables which reduce the accuracy of this method. The aerobic heart rate zones are based on age and does not take into account one's resting heart rate and therefore does not factor in the aerobic fitness level of the individual. These measures act as broad target and may be too low or too high for some individuals. Another variable is the possible inaccuracy of self-measuring and counting the heart rate. It is possible for miss count which will provide inaccurate results. Another variable is cardiovascular drift which will cause the heart rate to increase caused by reduced stroke volume while effort output remains constant (Coyle & González-Alonso, 2001). Research finds that this is caused in part by sweating in response to increased body temperature which results in greater blood flow to extremities and therefore reduced stroke volume. In response the heart beats more rapidly in compensation for the reduced volume of blood pushed with each pump (Souissi, Haddad, Dergaa, Saad, & Chamari, 2021, S. 1-6). A few additional causes for variation include movements with the arms above the heart and changes in direction of the movement. This can therefore give an inaccurate impression of effort output based on heart rate. Although these variables reduce the scientific accuracy of the heart rate measurement, the

purpose of using the measurement was to help build the dancer's awareness to effort output and training zones, as well as providing a reference point for the dancers to aid in self-regulating their perceived effort output. Feedback from the students revealed that it was new for them to practice measuring heart rate and they considered their training from a different perspective. This shift could perhaps help optimize their training efforts by keeping their focus on target. However, it is important to keep in mind the degree of inaccuracy in the heart rate measuring which could be optimized with better heart rate measuring equipment and from a more accurate heart rate target found through establishing resting heart rate. Another possible method to help dancers better understand their heart rate zones is to educate and establish the use of the Borg scale which is used as an indicator based on perceived physical exertion in relation to heart rate[17] (Ekkekakis, 2020). In the introduction of this training week the Borg scale was discussed with the students to inform them about its possible application.

Should this training strategy become a regular training component for dancers it would be a valuable asset but due to the relative short duration of time for each training session, it

RATE OF PERCEIVED EXERTION (RPE SCALE)

Point	Effort	Description	% of Max HR
6	No Exertion	Little to no movement, very relaxed	20%
7	Extremely Light	Able to maintain pace	30%
8			40%
9	Very Light	Comfortable and breathing harder	50%
10			55%
11	Light	Minimal sweating, can talk easily	**60%**
12			**65%**
13	Somewhat Hard	Slight breathlessness, can talk	**70%**
14		Increased sweating, still able to hold conversation but with difficulty	**75%**
15	Hard	Sweating, able to push and still maintain proper form	**80%**
16			85%
17	Very Hard	Can keep a fast pace for a short period	90%
18			95%
19	Extremely Hard	Difficulty Breathing, near muscle exhaustion	100%

Figure 7: Borg Scale of Perceived Rate of Exertion sourced in accordance with the copyright policy from MoreLifeHealth.com

[17]Swedish born scientist, Gunnar Borg, specialized in psychophysics, the study of the relationship between a stimulus acting upon sensory and the perceived sensation generated. His studies from 1960-1970 led to the development of the widely used Borg scale using a 6-20 scale determining one's perceived exertion in performing an activity in relation to their heart rate frequency from 60 to 200 beats per minute.

was decided that we did not have sufficient time to understand and integrate the scale in a way to optimize the dancer's experience and results. Further, from the perspective as the trainer, I was experiencing the first-time try out of giving this training strategy and felt that my priority and focus in these first training sessions was to establish the training structure and test the feasibility of offering such a training in terms of preparation, quality and effectiveness of the exercises. Time permitting, I would in future aerobic training sessions, highly consider the use of heart rate monitors and the Borg scale for further development of the determinable effectiveness of the training.

On the third training day, following a short introduction and discussion of the plan for the day, we began with the 1st heart rate measurement to act as a base starting place before any training had begun. Then we followed through an approximately 10 min long warm up portion, designed to mobilize the joints and increase the heart rate. Following the warm up, we took the 2nd heart rate measurement, just before beginning the aerobic portion. This heart rate measurement helped to show the students if they were now in their aerobic zone or if they needed to increase their effort output. All of the students except for 1 had achieved an aerobic heart rate level at this point. Following this, we continued into the aerobic portion in which we executed each exercise as planned and as practiced on the previous days. Each exercise was connected with the moving transition, thereby removing any pauses or breaks to maintain heart rate and minimalize recovery. Some exercises were lengthened by adding repetitions to certain parts. This aerobic portion was completed in 25 mins for group 1 and 23 mins for group 2. The variation in time comes from the length of the transitions between exercises. Following the aerobic portion, the heart rate was again measured 3 times consecutively to demonstrate the rate of recovery. For the purpose of this review the 1st measurement will be referred to as it suggests the heart rate frequency of the dancers immediately following the training. After the heart rate measurements were recorded, we continued into a cool down portion to slowly reduce the heart rate, return the body to normal homeostasis, and aid in the detoxification of the body by flushing lactic acid from the tissue. This portion continued for approximately 10 mins and the dancers were encouraged to drink water. The following table lists the students in each group, their age, target heart rate zones and the heart rate measurements taken before the training, after the warm up, and after the aerobic session.

5.1 Training results of group 1 and 2

Group 1

(Time of training 9:15-10:30)

Student	Age	40-59% HR_{max} (Low aerobic zone)	60-90% HR_{max} (High aerobic zone)	HR #1	HR #2 after warm up	HR #3 end aerobic session
N…	22	20-29	29-45	19	33	42
M…	25	20-29	29-44	16	31	44
H…	22	20-29	29-45	22	38	41
V…	22	20-29	29-45	15	23	30
E…	26	20-29	29-44	21	36	42
S…	22	20-29	29-45	19	32	36

Group 2

(Time of training 10:45-12:00)

Student	Age	40-59% HR_{max} (Low aerobic zone)	60-90% HR_{max} (High aerobic zone)	HR #1	HR #2 after warm up	HR #3 end aerobic session
K…	20	20-30	30-45	18	33	42
Ki…	23	20-29	30-44	17	34	46
B…	20	20-30	30-45	19	37	50 above target
A…	22	20-29	29-45	19	36	46 above target
E…	23	20-29	30-44	19	26	35

It can be assumed that due to the previous mentioned variables in heart rate measuring that it is not possible to determine definitive results but the trend from the data reasonably suggests that the dancers were working in their aerobic zone during the period of the aerobic training. We can also see that the majority of the dancers were working in the higher range of the aerobic zone which according to researcher Matthew Wyon, a minimum of 20 minutes of continuous training in the higher range of the aerobic zone is required to train the aerobic system (Wyon, 2005). The original aim of the strategy was to target the lower aerobic zone, working at 40-59% HR_{max} for a longer duration of time (min. 30 mins), however the training material fell between 5-7 minutes short and the dancers recorded higher effort outputs. As a result, the aim to target the aerobic system was still achieved but the resulting effort range and length of training was not as planned. We also can see that several dancers, at the end of the training, recorded HR measures that exceeded the aerobic zone and thereby pushing into their anaerobic zone. This suggests that the training pushed the dancer's effort output to exceed the aerobic boundaries and created a possible situation of interval training, alternating between the use of the aerobic and anaerobic system. This type of training, while still offering benefits, fails

to meet the conditions of aerobic training and are more effective once the dancers establish a strong aerobic fitness level.

Upon reviewing the results of the training session and the material that was given, several areas received suggestions for improvement. The following segment goes into detail regarding these areas and how the subsequent training sessions performed in April, take these adjustments into account.

5.2 Reviewing training results

The structure of the original exercises was built in a multi-part system designed for the possibility of repetition. This helped the dancers to quickly learn the exercises by compartmentalizing different sections and making it possible to quickly recall the information. However, the use of increased repetitions was only moderately utilized. The structure of the exercises proved to be complex and while doing the exercises returning to previous sections to repeat didn't feel as simple as previously believed. It was observed that simplified exercises with greater repetition and easy variations would prove to be more effective in combating mental fatigue associated with concentration on movement sequences and allow more space for enjoyment.

In the next aerobic training sessions, the exercises continue to be structured in a multipart format, but the individual sections were less complicated. Certain core sections of the exercises return between the introduction of further sections following an A-B-A-C-A-D structure, where section A returns and repeats often. Additionally, certain thematic sequences appear within other exercises and certain exercises completely repeated. What was important was to maintain the sense of a progressive class that moves through exercises that could be envisioned as a training within a professional company setting. For this reason, total over simplification of movement vocabulary or the reduction of the variety of movements was avoided in the aim to provide a rounded training that targets all muscle groups in various forms of coordination and qualitative use.

Another important observation from the training was noting which movements are appropriate for aerobic training and which are not. In the effort to remain within the target aerobic zone and not spike exertion into anaerobic levels or to drop too low where the body will enter a state of recovery, the movements cannot over or under stress the body. It was advised, for example, that the incorporation of moving down to and up from the floor be avoided. The body must be physically stressed to experience a training stimulus but the spikes

and plummets of effort create the conditions of aerobic training and therefore should be avoided.

5.3 Aerobic contemporary training in April

In April of 2021, there were 4 days of training with the same group of students that followed a similar strategy but in a more efficient format. Rather than using a 3-day structure, the exercises were introduced on day 1 and served as the sole learning day. This day gave the students an overview of what to expect for the following training session and introduced all the movement material that they later encountered. The following training sessions of the two groups followed a relatively similar structure to one another with small variations within the number of repetitions inside an exercise. The training was guided through my equal participation as real time demonstration as well as audible cues that guided the dancers from one movement section to the next. Again, due to this format, the exercises were kept simple and easy to learn. Variations within the exercise content was given live time to offer ways to regulate effort output. Following each day, a discussion with the students and further reflection of the training was carried out in order to consider any other adjustments to be made for following training sessions.

In the April aerobic training sessions the use of heart rate measurement was also not used. The choice to not include the heart rate measurements was decided based on reviewing the usefulness of the information which cannot be taken as accurate. The previous training sessions had demonstrated that the students achieved aerobic conditioning through the duration of the training and moderation of the exercises that maintain effort output. Therefore, the format of the training maintained these conditions to ensure an aerobic experience. Being the second attempt at the training, the students also had a better idea of how they would feel during the training and be able to better self-regulate their exertion. The plan for these sessions was to begin with a 10-minute warm up, followed by a 35 to 40-minute aerobic portion and finishing with a 10-minute cool down. As the training in February was not as long as anticipated, more attention was placed on lengthening the aerobic portion and maintaining a more constant energy output. Another aim of these sessions, was to build the flow and ease of application of such a format for the possible use in professional training situations. With this in mind, certain parts of the process from the original strategy had been modified or condensed to try to achieve a streamlined approach to integration. The reason for this consideration comes from the perspective that the daily company class is a delicate subject and that changes or new training

ideas are most successfully integrated when the modification is done smoothly without cumbersome attributes that could cause negative response. In creating a radical change to a dancers training, it could lose its acceptance for further application. With this in mind, I aimed to find a strategy that is light to integrate without losing all of the character of a typical company class.

5.4 Results from the April aerobic training

During the April aerobic training sessions there were variables outside of the content of the training, which influenced the experience and possibly the results. These variables were: the change in time of day of the training, and the location. In February the aerobic training sessions were given in the morning, whereas in April they were carried out at 17:00 following a full day of normal scheduled bachelor classes. This change in time was viewed as a challenge by the students who commented on their fatigue at the end of day, or difficulty to find motivation for such training after their other classes. This raised also the awareness that such training placed either at the start or end of the day will increase the total load of the day. Therefor it re-enforces the need for proper planning and balance with the overall working demands. In general, research suggests that aerobic training should be integrated at the start back of a season to build up a good aerobic level and during lower intensity periods. However, to maintain endurance levels, aerobic training should be performed 2-3 times a week (Simmel, 2014, S. 223). Despite the student's difficulty to engage, once the training started, the mood and atmosphere was positive and energized. The variable of the space also presented a certain challenge. In the training with the first group, we were in the university's *Studiobühne*. This space has no mirrors and it became quickly apparent that for such a training, the mirrors aid the dancers in the inevitable state of following as well as assisting the trainer in assessing the condition of the participants. With the second group the following week, we were able to use a studio with mirrors, which assisted in the picking up and execution of movement by following visually.

The content of the training in this secondary version had been adapted to include higher repetition within the exercises while still utilizing some previous strategies such as naming the different parts of the exercises, and utilizing a moving transition between exercises. In these last sessions the exercises were also constructed to fit better to the tempo, phrasing and length of the music. This meant the dancers could feel more at ease with musicality, and the time between exercises was reduced by eliminating the need to change the track of music. The

training again followed a similar structure in that it began with 2 long warm-up exercises, followed by the aerobic portion, and ended with a cool down period. The timing of the exercises was as follows.

5.5 Exercises and duration

Warm Up

1. Warm Up- Mobilizations (3:47)
2. Warm Up- Floor Work / Conditioning (8:22) Warm Up Total: 12:09

Aerobic Portion

3. Feet- Plie- Tendu (3:54)
4. Rond de Jambe and Weight Transfer (3:53)
5. Chasé and Transfer (5:12)
6. Leg Swings - Fondu (3:46)
7. Arm Circles and Spiral (4:50)
8. Box Step and Battement Combo (4:04)
9. Small Jumps (3:48)
10. Dynamic Jumps and Move in space (5:07)
11. Triplet (3:59) Aerobic Portion Total: 38:34

Cool Down

12. Winding Down - Follow (9:07) Cool Down Total: 9:07

For a video reference to the second training trial performed with group 1, follow the link in the footnote below[18].

5.6 Summary of aerobic training trials

While the format of the aerobic training still has the possibility for improvement and modification, it demonstrates promising potential for application within a professional setting. The amendments made from the 1st training period in February to the 2nd in April, made a clear difference in the streamlining and overall beneficial purpose. In achieving a longer aerobic portion through greater repetition and re-organization of the content structure, the training

[18] Video link to the April training trail of group 1 in the Studiobühne at the Anton Bruckner Privat Universität. https://youtu.be/qMpw6WuE11Y

better meets the required conditions and duration needed in aerobic training while being achieved in a quicker set-up. This more efficient version can assist in the ease of application within a professional company setting, where finding enough flexibility in the schedule for such training applications can pose a challenge. In further improvements the training could develop a stronger clarity of movement sequences which both stimulate the dancers while providing an ease of application. The more often the training is performed, the dancers and instructor will increase their confidence in their command of the movement sequences and gain a freedom in their ability to range in variations. The results suggest that this type of training would be most effective when regularly repeated and after repeated sessions, would allow for variations or lengthened duration to match the increasing aerobic capacity of the participants.

The next stage of trial for this training strategy would be a try out within a professional setting, in which greater variables such as directorship desires, dancers training favorability, and the overall structure of scheduling within rehearsals and performances becomes the possible obstacles to navigate. Until this type of training is well integrated and accepted within the professional setting, the current mandate for training will continue and the expectation for dancers to solely train aerobics in their private time will prevail. The possibility for an improved and well-rounded training system within the work setting of professional dancers is possible and the sport science of training methodology can support a healthy development to training regimen for dancers. But in order for dancer's fitness to improve, it must be in balance with the working demands and supported through proper training principles to create an effective balance between rest and work load. Researcher Matthew Wyon echos this by stating, "The integration of these sessions must be carefully introduced into dancers' schedules and there may be a need for these sessions to take the place of some dance classes to prevent over-training. The way a dancer is trained, especially within a company environment, should be reviewed" (Wyon, 2005). In the following chapter, the concept and applications of training principles will be discussed as well as why they face challenges to be integrate into current dance companies schedules and suggestions on how this could be addressed.

6. Training Principles: Integrating periodization, tapering and rest for dance companies

For several decades research based dance science has begun to follow the lead of sport scientists in their advancing applications of training principles. One of the fundamental developments has been understanding the rest to training ratio for the benefit and health of athletes. Physical training causes biological adaptation as a result of the bodies response to a stimulus that disrupts the body's state of homeostasis (Macdougall & Sale, 2014). Authors Macdougall and Sale explain that this response is the body's means of protection against potential harm and this adaptation results in improved performance. The physiological process that occurs when the body is met with a training stimulus means that it will become fatigued over time. This state of fatigue, triggers the body into the state of recovery. Recovery of different body systems requires different lengths of time. In the short term the body will experience increased blood pressure and heart rate but longer lasting is the build-up of lactic acid in the muscles over several hours, electrolyte imbalance lasting up to 6 hours, a reduction of energy stores for up to a day, and damage to cell particles can require between 3 to 10 days to repair (Simmel, 2014). During the recovery period the body enters into supercompensation, which is the body's positive adaptation to the training stimulus. In this state of supercompensation the next increase in training can be introduced and is referred to as progressive overload. Progressive overload is the incrementally increasing of a stimulus which maintains a positive physical adaptation and can be achieved through numerous ways of increasing the intensity, volume or frequency of the stimulus (Macdougall & Sale, 2014). How the intensity of training is increased, depends on the type of training. For dance, we can increase the difficulty in the coordination of the exercises creating a greater demand for the body to maintain control during execution. An increase in volume requires greater repetitions or increasing the duration of training (Franklin E. , 2012). As the bodies different systems do not recover at the same rate, a stabilization period

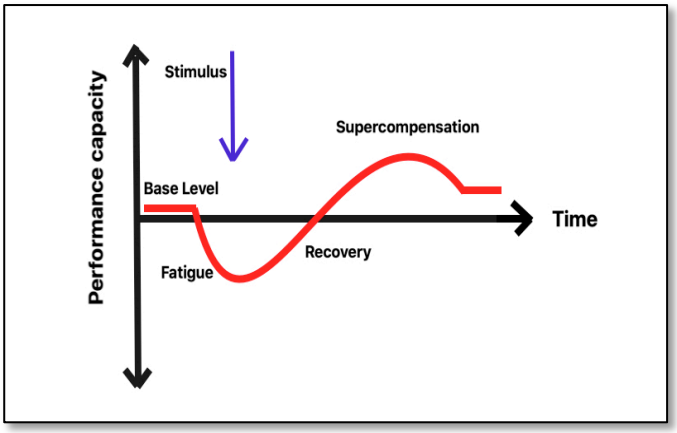

Figure 8: Principles of physiological adaptation to a training stimulus. Created by the author in adaptation from L. Simmel, Dance Medicine in Practice. 2009

is suggested where the training remains constant, giving the slower body systems time to fully recover.

Without progressive overload the body will not benefit from further adaptation. If the training is only given at the same intensity or volume, then the training gains plateau and improvement stops (Franklin E. , 2012). Therefore changing the training stimulus and varying the exercises, demands the body to continually respond to new challenges. In order for the body's homeostasis to be irritated enough to adapt requires the right intensity and volume from the stimulus at the right time. Too little training stimulus and the body will not respond but a stimulus that is too great can put the body at risk of injury. The timing which describes frequency, is also of importance. For effective training gains, the increased stimulus must be introduced while the body remains in supercompensation, which will lead to optimized progression as demonstrated in figure 9. Introduce the stimulus too soon and too often and the body doesn't manage to recover and adapt, therefore a slow deterioration occurs as we commonly see in overtraining and often leads to burn out or injury (Simmel, 2014). In the opposite situation, should the stimulus be introduced too long after the supercompensation phase, the body will not have retained the benefit of the training and the fitness level is at best maintained. If a long enough break from training occurs than reversibility results, where the fitness level is reduced in relation to the length of time without training (Quin, Rafferty, & Tomlinson, 2015). As a general rule, as glycogen stores are replenished the body recovers energetically and is prepared to train again. However, following an exceptionally high intensity training, muscle tissue in the body is still undergoing cellular repair and will continue to experience muscle soreness for several days which may hinder training, requiring a longer recovery period before introduction of a higher training stimulus (Simmel, 2014).

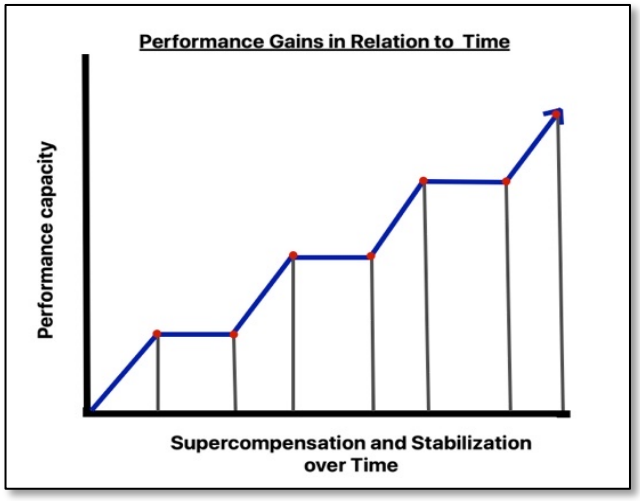

Figure 9: Performance Gains and stabilization periods over time. Demonstrating results from optimal progressive overload. Created by the author in adaptation from L. Simmel, Dance Medicine in Practice, 2009.

6.1 Periodization

Even when following principles of physiological adaptation, the body periodically requires longer periods of recovery, which may vary depending on the prior training intensity. Therefore, over longer training periods of high demand, such as several months or a full season, periodization and the principle of tapering, can support the dancers to ensure they are able to perform at their maximum capacity for critical events such as performances. Periodization is defined as training that is planned in cycles of progressive overload and periods of rest. These cycles can be viewed at various scales from macro, suggesting an entire season, to micro, a single week (Lorenz & Morrison, 2015). For athletes a micro cycle is generally designed with 3 or more overload training sessions, several active recovery sessions and at least one day off for rest. These micro cycles are intended to build from one week to the next so that there is a progressive build in training between 4-6 weeks, making a mesocycle. This is viewed then at a macro scale which allows training to be tracked over the duration of an entire season. The pattern of the seasons training is made up of a series of mesocycles, each being followed by a week of lighter recovery training (Kaufmann)[19]. The challenge with adapting periodization for dance companies comes from the structure of the seasons, which is built around performances and not training. But if we zoom out and consider the working plan for an entire season, we are offered the opportunity to observe periods of higher working intensity due to reasons such as a high concentration of performances or minimal days off versus periods of better balanced workload. In isolating these time periods, we can ensure progressive overload training occurs in the appropriate working periods. The start of the season should also have a gradual build up, particularly taking care with jumps to ensure landing technique returns before progressing to more complex coordination and *grand allegro* (Starr & Keller, 2020). By having a prepared season plan, it allows the artistic team to plan for training blocks that mimic mesocycles of periodization, ensuring that these progressive training blocks are planned with the space to follow with a period of reduction in the training (Simmel, 2014). By building this overview of the season, another important principle called tapering can be planned for.

[19] American Sarah Kaufmann is a professional cyclist and cycle coach for elite level athletes built on sport science principles of training. Kaufmann is the owner and operator of K Cycling Coaching.

6.2 Tapering

Tapering is a reduction in the training load leading up to an event such as an important performance. Tapering can be implemented by a reduction in training intensity and or volume and when well utilized it has been reported to increase performance results in athletes (Reuter, 2012). These performance gains are the result of enabling the body to recover and replenish energy reserves (Quin, Rafferty, & Tomlinson, 2015). The longer the performance, the longer the duration of the tapering should be in order to ensure that the dancer is able to peak at the right time. For athletes it has been suggested that 10-14 days is required for medium length events of approximately 1 hr. However, for shorter events as little as 4 days can be beneficial (Hamilton, 2020). But what does that mean for dance training of a company? When we consider the high frequency of performances, it is difficult to plan an effective tapered training plan. However, it is suggested that incorporating the principles of tapering to the best of one's ability still offers a benefit (Quin, Rafferty, & Tomlinson, 2015). Researcher Liane Simmel also suggests building up activity until 14 days before a premier, followed by a 1 week period of maintaining working intensity and at 1 week before, to taper the training and rehearsal load. Simmel also asserts that the dress rehearsal should be followed by a day of rest prior to the premier (Simmel, 2014). In reality, many theatres schedule the dress rehearsal for dance companies the day before the premier and the week leading up to premier is filled with high stress inducing run throughs as the costumes, lighting, set design and possibly orchestra all come together in the last week. Changing this, takes a restructuring in the season planning, but the possibility to reduce the intensity of training and avoiding exceptional long hours still spent rehearsing, is capable through good planning and preparation from the artistic team. Part of better planning to avoid the enormous push in the last weeks of a new production, comes from a better overview and tracking rehearsals and training from the start to the end of a process. Before a production begins, tallying rehearsal blocks and rehearsal hours per week and over the entire process is a strategy that helps the choreographer keep a realistic timeline in mind. My experience in various theatres has been that dance productions are slated to have 5-6 weeks to prepare from the start of rehearsals to stage. This can be misleading when productions are running parallel to each other. This creates an overlap in working hours and reduces rehearsal hours from the upcoming production due to scheduled performances. More realistic is to offer a schedule that outlines the number of rehearsal hours a choreographer will have per week and a total for the entire production with clear announcement of the stage run throughs leading up

to the premier. This serves the trainer as well to clearly see the ebb and flow of the rehearsal process for each production.

6.3 Rest and recovery

Considering this strategy of planning from another equally valuable aspect is the incorporation of rest. In dance culture, rest has not always been a welcome term. Although in sport science, the benefit of rest has been understood for decades, old-school mentalities in dance are still being re-educated to valuing and implementing rest as a key factor to the success and longevity of dancers. The main misconception around rest is the belief that the body will decondition and technical ability will be reduced during a day off. In actual fact, following progressive overload training, the body requires rest in order to benefit from the training. As discussed above, in the recovery phase as the body repairs muscle tissues and re-establishes its homeostasis state, is when adaptation occurs. But recovery and rest doesn't mean the same thing and there are different levels and quality of rest. Then what are the traits of recovery and rest? What defines rest and when is it warranted?

6.4 Recovery

If we look at recovery, in the context of post training, it is defined as the body's return to its regular homeostasis which addresses, dehydration, muscular tears, chemical imbalance of acid-base and oxygen to carbon balance. This is accomplished through re-plenishing of fuel through hydration and nutrition, proper rest, regeneration of tissue, and reduction of inflammation (Comana, 2022). Recovery can be seen at different stages from immediate, short-term and long-term. Immediate recovery occurs while exercising as reduction in intensity allows heart rate and breathing to slow. Short-term recovery occurs in pauses between activity and in recent practice has been advocated to be used as what is called active recovery. This suggests that through reduced exertion but a continuation of low impact movement that keeps the heart rate slightly elevated, the circulation of blood helps flush lactic acid from muscular tissue for a better overall recovery (Starr & Keller, 2020, S. 17). This is employed in H.I.I.T training and also in a proper gradual cool down to end training sessions. Long-term recovery occurs between training sessions and can vary in duration caused by physiological factors as well as the quality of recovery, e.g., re-hydration, nutrition and rest. Like athletes, dancers place a high demand on their body and require top fuel and quality rest to perform their best. Rest however, is an often undermined component, in part to scheduling and being undervalued.

6.5 Rest

According to Human Kinetics, rest is the at the foundation of recovery and is categorized as sleep and downtime (Human Kinetics, 2021). Sleep is seen as one of the most important aspects and is valued by its quality, quantity and routine. Failing to receive adequate sleep leads to negative impacts on mood, cognition, immune health and of course physical performance. Human kinetics also reports that counter to speculation, most athletes in elite training struggle to achieve quality sleep, which in part is caused by irregular schedule in activity, muscle soreness and travel (ibid). A research study by Sargent and Roach in 2016 on sleep duration in elite athletes following evening competition, reported that there was a big disparity in the routine and quantity of sleep following evening events when compared with day events. Following an evening competition, athletes went to sleep later by 2.5 hours or more and received significantly fewer overall hours of sleep, ranging from -2.1 hours to -2.4 hours, although efficiency of sleep remained unchanged. Reasons for delayed onset of sleep have been suggested from physiological arousal and increased body temperature associated from the competition, both having impact on the ease of inducing sleep (Sargent & Roach, 2016). Given that dance companies often have evening performances and rehearsals, consideration should be given to the quality and possibility for the dancers to adequately rest for the following day. It has also been recommended that following late evening performances or rehearsals that the following days training begin later to compensate for reduced recovery time (Simmel, 2014). Besides sleep, Human Kinetics suggests that rest can be achieved in downtime where mental recovery and relaxation are in focus (Human Kinetics, 2021). Downtime is time spent outside of physical and mental demand of the working day and can look different for each individual. Downtime in general should have a sense of relaxed enjoyment and avoid stress, induced physically or mentally and instead help build a work-life balance. Downtime is influenced by the working regulations that manage the maximum working hours per day and week. Companies that build the schedule into a split day format, working both mornings and evenings with a longer break in the middle of the day, are influencing the viability of downtime and sleep for the dancers and artistic team. Additionally, if dancers assume training regiments outside of the working hours, this too will impact the duration and possibility for quality resting time. A first step to supporting dancers in making beneficial choices around their rest time is by offering a well-planned working schedule early enough in advance to allow the opportunity for the dancers to organize their personal time. It benefits the dancers and the artistic team as

well to have a clear working schedule that allows for better preparation and anticipation of the work load.

The organization and implementation of these training principles for a dance company faces challenges. But in doing so it allows for the entire system, from training to performance, to strike a better balance. Having discussed in the previous chapters these three components of harmonized technical training, conditioning and fitness, as well as training principles, the following chapter will discuss in detail the strategy and application of these theories during two practical work placements at the Oper Graz in 2020 and 2021.

7. Practical work at the Oper Graz

In this chapter, the practical work conducted with the dance company at the Oper Graz in Graz, Austria will be discussed. I was contracted as an additional ballet mistress and rehearsal director for 3 months from 03.09.2020-30.11.2020 and again for 2 months from 01.10.2021-30.11.2021. These two working periods offered the opportunity to try out theoretical ideas in a practical setting and a research project was designed to implement and assess the various applications for the company's daily class. The intention of these applications is to create training content that directly correspond to the current and projected working demands of the company, taking into consideration the intensity level of the working schedule, the stylistic and skill demands of current choreography, while promoting a balanced approach by respecting training principles and integrating fitness training. The aim of the project was to investigate if this approach could better support the dancer's health and performance outcome. By tracking the training plans and working activities as well as through the use of surveys and feedback, the project was able to provide testimonies, observations and information to questions regarding the applications in relation to actual working conditions. Prior to these 2 working periods, I had been engaged as a company dancer for two seasons at the Oper Graz, which provided me with a clear understanding of the working conditions in the theater. Therefore, the design of the project was catered to the total context in which it was executed and will now be outlined.

At the time of this project, the dance company of the Oper Graz comprised of 18 dancers, 9 female and 9 male ranging from 20 to 34 years of age. The dancers came from various international backgrounds and with varying experience and training. The company runs under the direction of the ballet director, the company manager and the ballet master. During this project, the ballet master was choreographing and this warranted the need for my role as an additional ballet mistress and rehearsal director. As in many European theatres, the various departments of the house are under the direction of the theatre director, who ultimately oversees the artistic direction and outlining of the season. Due to this structure, at the Oper Graz there were collaborative productions between departments, resulting in the dance company additionally performing in opera and musical productions. This expands the working environment for the dancers, affects the working conditions and work load. Another important consideration is the working hours of the company. A normal working week was from Tuesday through Friday plus a half working day on Saturday. This situation is affected by performance

and stage rehearsals which can occur outside the typical working hours. The working hours themselves are a mix of working through days (10:00-18:00) and split days (10:00-14:00 and 19:00-22:00) which are set to alternate. Tuesday and Thursday the company worked until 18:00 and Wednesday and Friday were split days. Saturdays often had performances and resulted in a split day, rehearsing until 14:00 and an evening call for the performance. The working regulations also stated that between morning and evening work periods, a minimum 4 hour break must be given and the minimum rest period between working days was 11 hours.[20]

For the company, a standard working day begins with a 75 min ballet class. During the first working period in 2020, the classes were partially divided between the ballet master and myself, alternating for the first week and slowly I took over more classes until by the second month, I was the sole teacher for the company. By comparison, in 2021 I gave all of the company classes and warm up classes for the entire duration of the project. Other duties besides giving the company class included being involved in all rehearsals to assist, give corrections, noting of the work, preparing the second cast and leading rehearsals. Outside of the studio I was responsible for the weekly schedule, updating and communicating schedule changes, organizing costume fittings, communications with technical and stage design departments, and on occasion I was assigned *Abenddienst*[21] for performances.

In the first working period, the company worked on the following productions; *Bühnen Show, Cinderella, Anatevka*, and *Rotkäppchen*. The *Bühnen Show* is a season preview performance performed on the main stage at the start of the season. In this performance the dancers performed an excerpt from a new ballet creation *Undine* and had 4 performances over 2 days. *Cinderella* was performed on the main stage as a revival from the previous season. This production ranges from point work to dancing in ballroom shoes with classical and neoclassical movement vocabulary. *Anatevka* was a musical production performed on the main stage. For this performance the dancers were divided into 2 casts with 16 performances per cast. This piece uses contemporary, jazz and hip-hop movement vocabulary. The new creation, *Rotkäppchen,* was a ballet for a youth audiences performed in the black box theatre using neoclassical and contemporary movement. This production was also divided into 2 casts of dancers. In this first working period the range of the work varied from requiring training in

[20] The working regulations described in this chapter are taken from the *Probenregulative* of the Theaterholding Graz for the Oper Graz revised from 19.08.2019 under the authority of Theaterholding Graz Geschäftsführer, Mag. Bernhard Rinner, *Geschäftsführende Intendantin*, Nora Schmid and *Betriebsratsvorsitzender*, Mag. Martin Fournier.

[21] *Abenddienst* is a position held during performances. This person is responsible for communications between the front of house and backstage in case of emergency.

point shoes for the more classical work to contemporary and demanded that the dancers adapt with each production. Similarly, in the 2nd working period in 2021 the dancers had a vast range in the work. In 2021 there was a revival of *Anatevka*, the premier of *Rotkäppchen (*due to Covid-19 the original run of performance in 2020 were cancelled), and the premier of *Der Wolf,* a new creation performed in the black box theatre with 2 casts of dancers in contemporary and neoclassical movement vocabulary. Additionally, the dancers were in performances of the operetta *Clivia*, which used 13 dancers. This production was performed on the main stage and ranged in style from contemporary to jazz. As the two working periods were separated by almost a full year, it presented the opportunity to reflect and change certain aspects of the approach and will be discussed later in this chapter.

7.1 Project outline

Before the start of the project, I had received the season plan for the dancers which provided an overview of the performance schedule, working days, free days, and working hours. By examining the schedule it offered a preview of the work load, highlighting intense working periods or lighter weeks and that in turn would allow for appropriate scheduling of training aims in coordination with the projected work load. This planning had to take into consideration a wide range of variables which influence the target of the training as they act directly against the condition of the dancer's health, rest, and goals. Therefore, the training in each class was planned with consideration of the following variables:

- **Daily working schedule**
  working hours, breaks and rest periods, rehearsal/performance intensity
- **Previous working day**
  working hours, breaks and rest periods, rehearsal/performance intensity
- **Weekly plan**
  day of the week, performance schedule
- **Point within the season**
  long term projected training plan
- **Technical and stylistic requirements**
  upcoming productions in varying styles: contemporary, classical, point work, or other
- **Current status of the dancers**
  illness, injury, fatigue, stress level, mental well-being/mood and emotional condition

Consideration of the above outlined variables calls for different approaches depending on the situation. As an outline of how various work load situations are strategically handled, the following examples describe the response to those working situations.

7.2 Examples of training strategies based on working condition variables

Example 1: Post high intensity performance

The day following a high intensity performance, which finishes late in the evening, the training is planned as *recovery level 1*[22] and can focus on development of artistry, proprioception training and integrated active rest. The start of the training begins slowly with considerable time to mobilize and warm the body. When possible, the class time shifts to start 1 hour later, allowing for a greater recovery time (Simmel, 2014). Highly demanding coordination and challenging skill elements are not included and highly taxing energy elements such as jump exercises, very fast or very slow tempos are reduced. The aim is preparing the body and reduce muscular tension through increased blood flow and joint mobilization. This includes softer, flowing exercises with reduced volume of repetition that do not strain or overtly fatigue the body to offer a mindful build-up and easing into more demanding work.

Example 2: Regular work week

A week with no performances and normal working hours and conditions can have a building training program which follows a fitness and skill acquisition approach. In this situation a higher training stimulus can be implemented if in the coming week the work intensity does not suddenly peak. This may look like:

Day 1: level 2 training after the weekend pause.
Day 2: there is a noticeable training stimulus reaching intensity level 3.
Day 3: the training reduces slightly to allow a recovery for the body with intensity level 2
Day 4: the training again increases to level 4.
Day 5: the training is reduced again to either level 2 or 3 with considerations to the experience from the previous day's training and overall working demand.

Example 3: Consideration of stylistic demands

[22] To refer to the training intensity text, see section 4.3 Training intensity levels and traits, and content, on pages 26-27.

A new contemporary program is being rehearsed which requires a high volume of floor work, contemporary partnering, and contemporary movement vocabulary. Leading up to and during this time, the exercises in the class are adapted to incorporate a higher concentration of contemporary principles and when possible, a full contemporary class is given in replacement of ballet. The class focuses on the movement demands of the choreographic work, meaning that preparatory training for floor work and strength training for moving the body to and away from the floor are included. In a full contemporary class, simple partnering elements and contact work can be used to help the dancers prepare for giving and taking weight with a partner, listening to contact points, and staying present within the dialogue of their interaction.

Example 4: Tapering

The upcoming weeks will increase in intensity with a higher than average number of performances and stage rehearsals. Training slowly tapers to reduce fatigue and aid in sustainable preparation approaching the high intensity workload. This means a reduction in training intensity and or reduction in training volume within the class. This tapering of the training would be best combined with a tapering in rehearsals as well.

Determining which strategy fits best becomes complicated in the juggling of the working schedule alongside with training aims for different target areas of such as aerobic fitness, muscular strength, technical development or technical and stylistic adaption. Charting the work load over a month to month time span streamlines planning by highlighing working periods that are appropriate for training stimulus or recognizing periods where reduction or recovery is needed. The following three charts are a visual representation of the projected working times over the months of September, October and Novemeber 2020 for the dancers at the Oper Graz. These charts were created prior to the project based on the season overview plan in order to highlight the span of the working hours in the day and represent the schedule as planned but are not accurate as it occurred in reality. Due to the Covid-19 pandemic, much of the working plan was drastically altered. Also to be noted, is that these charts are a representation of the total span of the working hours in a day and not the total working hours. The split working days have a 5 hour break between 14:00-19:00 and therefore have equal working hours per day as a through working day. These charts are intended to create a visual representation for the resting period between working days and highlight the exceptional working conditions occuring with performance and stage rehearsals which are represented in red for their often later end time and variability in demand and stress induction. It is a matter

of argument, to the benefits and disadvantages of a working through day versus a split day. What should be considered is the disruption of the resting period and the strain placed on the body and mind to work physicaly in the evening hours. While it may remain a matter of ones preference, the testimony of the dancers[23] strongly implies that the split working day is more challenging for the body and mind and creates health impacts through reduced sleep, restricted social life and disrupted sleeping and eating habits. This disruptive scheduling becomes apparent when we take a look at the following charts.

In looking at the chart for September, we can note that 2 working weeks have a 6-day duration followed by a single free day. There is a total number of 6 free days in the month and there are 8 performances or stage rehearsals (05.09 and 06.09 were double performance days).

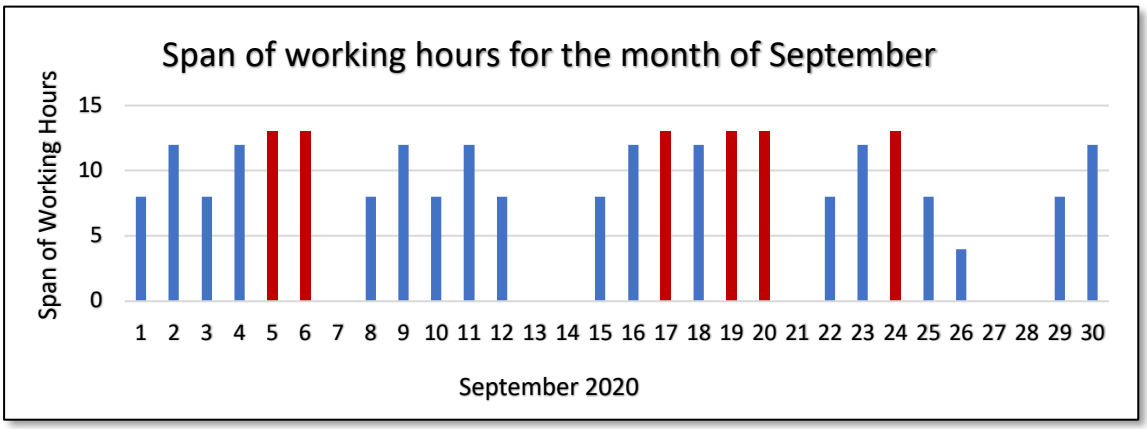

Figure 10: Span of the working hours for the month of September for the dance company of the Oper Graz

In September the company performed the season opening *Bühnen Show* and *Cinderella*. This suggests a high intensity level at the start of the season following the 6-week summer break. From looking at the irregularity and high intensity of September we can start to understand some of the challenges involved with building training plans that respect training principles. In the second week from 08.09-12.09 it offers the best opportunity for progressive stimulus and build up in the training due to its regularity in the schedule. The remaining weeks appear to call for a tapering or recovery approach in regards to the high intensity work load. This however, at the start of the season is hardly capable as the dancers are still building up to their pre-summer break fitness level. In TA.MED's publication, *Ready To Perform*, it suggests building up after longer breaks by maintaining 2 days off per week at the start of the season, offering a gradual build up in the training but not reducing class duration to ensure enough time for recovery breaks, as well as shortened rehearsal periods until the body has adapted to handle

[23] During this project, I conducted surveys in which the answers of the dancers provided the basis for this statement. It is also based on the collective opinion of the dancers in my following working situations at the theater in St. Gallen, Switzerland and Tiroler Landestheater in Innsbruck, Austria.

the workload of full rehearsal days (Starr & Keller, 2020). The publication also suggests that there should be an appropriate duration of build-up leading to the first performances that allows for the dancers to recover their fitness and technical level as well introducing a tapering effect prior to performance. In the scheduling for the Oper Graz, such high intensity at the start of the season forces either a too rapid push in training and demand or a delay in training build up which also leaves the dancers vulnerable.

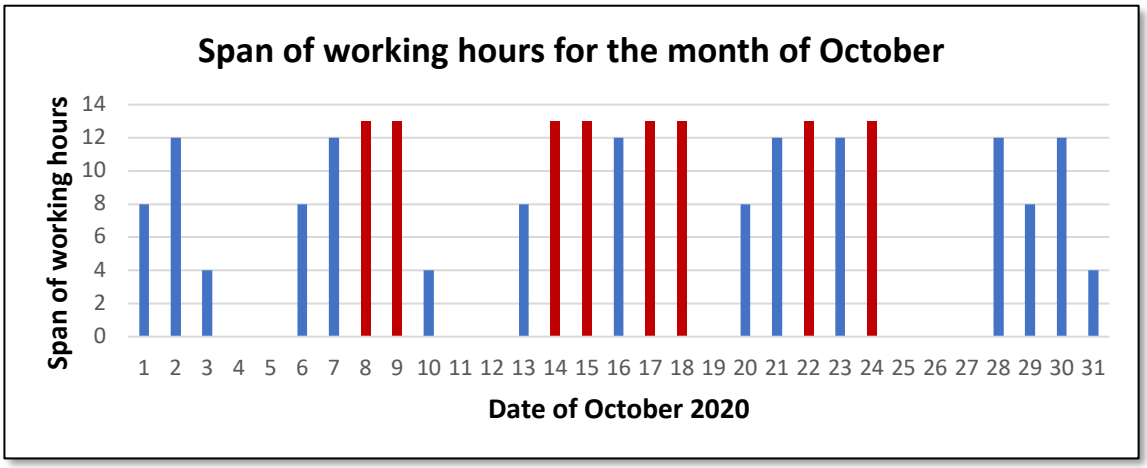

Figure 12: Span of the working hours for the month of October for the dance company of the Oper Graz

Looking at October, the dancers continued with performances of *Cinderella* as well as prepared and premiered the production *Anatevka*. Five working weeks spanned this month with 6 working days in the third week along with 4 intensive stage rehearsals and performances, followed by a single day off. This initially gives the impression of extreme demand but in total

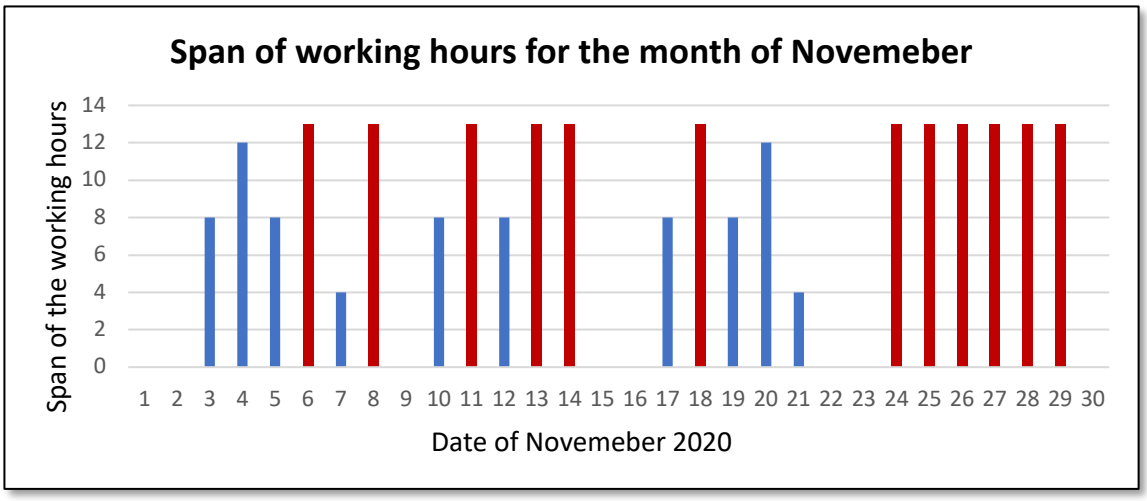

Figure 13: Span of the working hours for the month of November for the dance company of the Oper Graz

the dancers have 8 free days and despite the intensive week in the middle of October, the month has generally a better spread of the work load providing better opportunities to recover.

In November a very intense working period was scheduled. Performances of *Anatevka* continued alongside preparations leading to the premier of the new creation *Rotkäppchen*. The first and last work weeks are 6-day work weeks and the final week is exceptionally intensive due to the fact that every day there is either a performance of *Anatevka*, evening stage rehearsals or the premier of *Rotkäppchen*. This high intensity was balanced by the 8 well spread out rest days. Never the less, recognizing the high intensity of the work load that builds to the end of the month is important when reviewing the schedule to incorporate a tapering of training during this period.

When we consider the outlined working schedule the inconstant working times become highlighted to our attention. Each working day has a maximum of 8 working hours, but the split day structure results in a span of the work over 12+ hours. Due to the physical nature of the work, the time leading up to and directly after working hours is also effected. Dancers attest to often contributing their personal time in warming up or cooling down before and after class and rehearsals. Therefor it is important to consider when planning the intensity level and target of the training for the following day and we could ask, have the dancers had enough recovery time after a performance or late rehearsal? How could the training be addapted to not further stress the body during times of fatigue? Staying aware and mindful to the dynamic structure of the schedule is a strategy to keeping the dancers well being in mind. This can be seen as premeditated planning in relation to the working schedule and the following training program designed for the 1st week of the project (01.09.20-06.09.20) serves as an example. From this outline, a specific class plan detailing exercises to match training targets for individual classes was developed.

7.3 Sample of training plan

01.09.20	02.09.20	03.09.20	04.09.20	05.09.20	06.09.20	07.09.20
10:00-11:15 **Class** L3, C-b Aerobic, neuromuscular co-ordination	10:00-11:15 **Class** L4, CB Anaerobic, strength	10:00-11:15 **Class** L3, B-c Aerobic, muscular endurance	10:00-11:15 **Class** L2, B Low intensity strength	10:00-11:15 **Class** L2, B-c	10:00-11:15 **Class** L1, B-c	Free
11:35-14:00 **Rehearsal** Bühnen Show, Cinderella	11:35-14:00 **Rehearsal** Bühnen Show, Cinderella	11:35-14:00 **Rehearsal** Stage Rehearsal	11:35-14:00 **Rehearsal** Bühnen Show, Cinderella	**Performance**	**Performance**	
15:00-18:00 **Rehearsal** Bühnen Show, Cinderella	19:00-22:00 **Rehearsal** Cinderella	15:00-18:00 **Rehearsal**	19:00-22:00 **Rehearsal** Stage Rehearsal	**Performance**	**Performance**	

		Bühnen Show, Cinderella				

Figure 13: Working plan for week of 01.09-06.09.2020

The above chart is taken from calendar week 35, which was two weeks into the season. The schedule is broken into three portions; class, first rehearsal block and the 2nd rehearsal block. In the case of this particular week, 05.09.2020 and 06.09.2020 replaces both rehearsal blocks with performances.

The week plan above has been demonstrated in the following chart, as a visual aid to the variation of training intensity over the 6 day working week. The short duration of 15 minutes for these particular performances, gave reason to maintain a more progressive training in class at the start of the week and tapering the intensity to the 2nd half of the week due to the evening stage rehearsal and performances.

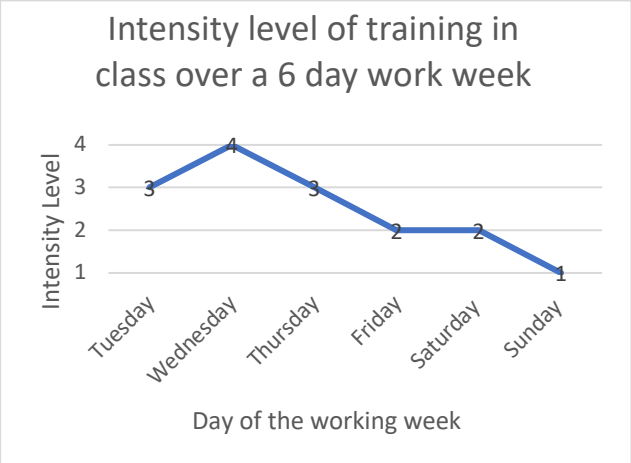

Figure 14: Training intensity plan for week of 01.09-06.09.2020

After creating the training plans for the classes over an entire week, the training in each class was planned according to the outlined training aims. The content of every class aims to be progressive and mindfully structured to ensure proper build up, a well-rounded composition, with a strong relatability of the content from one class to another by using repetition of skills to refine motor pathways (Wilmerding & Krasnow, 2009, S. 6-9). Principles that are introduced must be timely re-visited for their benefit to be maintained, but without a strong organization of the class, certain elements may be overlooked. For this project, this organization was maintained through the use of a daily log, allowing for details of the training and rehearsals to be recorded and referenced for future planning.

7.4 Data collection

During the project several modes of recording data were used. Primarily a daily log was kept to record detailed information to each day.[24] The table below is an excerpt from the log,

[24] To view the document containing all the daily logs over the period of the project, follow the weblink to access the file. https://drive.google.com/file/d/1rgKxtcpXUtAcmMrUkIk6x_BynqfZ6fvZ/view?usp=sharing

taken from the 11.09. Additionaly, once a month the dancers were asked to fill out a questionnaire. These questionnaires were carried out on a voluntary bases and therefore do not represent the opinion of the entire group. The questions aimed to retrieve information regarding the experience within the training and comments or suggestions for improvement. The accumulated data from the surveys aided in reflecting on ways to adapt the training applications which was made possible during the second working period in 2021.[25]

Date: 11.09.2020 Trainer: Jacqueline Lopez Duration and Time: 75 mins (10:00-11:15) Training level: L3 Classification: B-c Fitness target: Proprioceptive, Strength for supporting legs, cardio allegro Details: contemporary principles-leading from the centre, taking the head off the central axis, breath, succession	**Additional Notes** Injury/Illness (pre-existing): Several minor and pre-existing injuries in recovery and maintenance. Guests in Training: No Other: 1st full length training with the company. Introduction to training concepts.
Class Plan (see details attached below) *Barre*: (32 mins) Centre: (18 mins) Jumps: (20 mins) *Fouettes* and cool down (5 mins)	**Additional Notes** -*Barre* training targeting strengthening for supporting leg, *fouettes* preparation exercise -moving through space, change of weight, contemporary principles introduced
Break Duration and Time: 20 mins (11:15-11:35)	
Morning Rehearsal Block Time: 11:35-14:00 Location: *Ballettsaal* Program: Cinderella Scenes/ sections/ content: 2nd act Intensity Level: mid intermittent Dancers involved: all	**Additional Notes** -some dancers released 30 mins early -some dancers away for portions of the rehearsal for costume fittings
Break Duration and Time: 5hrs (14:00-19:00)	
Afternoon Evening Rehearsal Block Time: 19:00-22:00 Location: *Ballettsaal* Program: Cinderella Scenes/ sections/ content: 1st full run through Intensity Level: high Dancers involved: all	**Additional Notes** Mid-Rehearsal Break: 30 mins -dancers let go from rehearsal at 21:25
General Notes/Observations/Information -positive response to the class	

[25] To view the analysis of the surveys, follow the weblinks listed below. Pre-Project questionnaire: https://drive.google.com/file/d/19jKXczjlKWVcu6oG9K0saYrCzYpFVNtn/view?usp=sharing
September 2020 survey:https://drive.google.com/file/d/1qg1z4LUig0zv2lQQL04wbV_HnOr0ghTy/view?usp=sharing
October 2020: https://drive.google.com/file/d/15aq-eV6P7uT2ahpW2ALRMCbFxY7Y54-M/view?usp=sharing

-volume of jumps was demanding, targeting more anaerobic -strength training for strong supporting legs was well integrated -proprioceptive exercise, eyes closed with *port de bras*, well integrated. Could progress to try small section of slow tendu at the barre with eyes closed	

Figure 15: Daily log excerpt from 11.09.2020 working at the Oper Graz

7.5 From preparation to execution

At the start of this project on 03.09.2020 I met with the dancers to discuss the project and explain the concepts of the training. During this first meeting, the dancers were also given a voluntary pre-project questionnaire. The questionnaire helped me understand the starting physical condition of the dancers and what goals they had. Through discussion with the dancers and their answers to the questionnaire, I found interesting points worth noting. Of the dancers who participated in the questionnaire, 69% said to have done some training over their holiday break, while 31% did not train. After 2 weeks back to work, 15% felt that they were fully back in shape, 61% felt they were a bit under their full working condition, and 23% answered that they perceived they were only half way back to their normal working condition. This suggests that 85 % of the dancers felt they needed more time to return to their normal working condition referring to fitness and technique. However, in this same week they had 2 consecutive double performance days. Also noteworthy were the injuries reported by the dancers. Of the dancers who completed the questionnaire, 58% reported to currently have an injury. These injuries included; soft tissue injuries of the knee and ankle, bone injuries of the foot, and a disc injury in the spine. The dancers were also asked if they normally engage in supplementary training and if so what kind and how often. 23% of the dancers answered that they don't do any supplementary training, while 77% do. Of the dancers who train supplementary, they answered that they engage in activities including; yoga, running, cardio, Gyrotonics, strength training, plyometric training, and conditioning exercises. The frequency of the supplementary training ranged from 2-6 times per week.

On reviewing these responses from the dancers, it brought to my attention the necessity to implement adjustments slowly to the class. Their bodies were not yet at full working capacity and based on the number of injuries, out of precaution, fitness integration began slowly and our first training sessions together served more as an introduction for the dancers to become accustom to my teaching. Over the period of the project, the dancers became familiar with the aims and approach of the training which allowed for further development of certain aspects of the training application. How the proceedings of the project were carried out, will now be discussed.

7.6 September 2020

The month of September 2020 was intensive for the company. In this first full month of their working season they had 6 performances. Simultaneously, they began rehearsals for their October production, *Anatevka,* and worked two 6-day work weeks. The company also had six new dancers, making the remounting of *Cinderella,* a larger demand in the time needed to re-set the choreography.

As I began to give the training more regularly, I referred to the class plans and then adjusted real time to the actual condition of the dancers and the working situation. As an example, in the second week of September keeping in consideration that the dancers had begun to work on the contemporary based choreography of *Anatevka* but still had the upcoming *Cinderella* premier, I decided to offer a B-c training with the same exercises on both Friday and Saturday. I varied the intensity of the training by adding strengthening components and a higher volume of repetitions and *allegro* work on Friday versus a proprioceptive training on Saturday with longer pauses through the discussion of movement principles, therefore going from a L3 to an L2 class. The reduction of the training intensity on Saturday was in reaction to the evening rehearsal on Friday. It was also helpful that the majority of the exercises in the class remained the same from Friday to Saturday, allowing the body to work with greater ease in the patterns and coordination that had already been practiced. Over the continuation of the working period, I was able to introduce training for the core, upper and lower body strengthening, neuromuscular coordination development and anaerobic training in allegro and contemporary work. From the results of the September survey, in regarding to the inclusion of fitness training within the class, 50% of the dancers answered an anonymous survey saying that they felt the fitness components were comfortably integrated into the class, while 50% answered that they had a mostly positive experience but would like to increase this training. The inclusion of proprioceptive training was new for some dancers. We trained this through different situations with the eyes closed such as; balancing in 1st position, performing a port de bras sequence, reversing movements or moving backwards in retrograde, and doing center work not facing the mirror. This type of training was found to be interesting and useful for 79% of the dancers and 21% found it somewhat relevant but were not sure how to integrate this to their dancing. From these results, it was decided to continue with these training integrations.

At the start of the project, due to the variation of the classes given between myself and the ballet master, it was not possible to build training with a full week in mind. In this time classes were planned in advanced and then again adapted the day before to react to certain

factors such as the perceived level of fatigue of the dancers and the level of demand of the rehearsals and class in the day prior. The style of the class also ranged from a traditional ballet class to contemporary ballet, introducing floor work and movement principles of contemporary and modern technique. In the results from the September survey, 100% of the dancers answered that they felt a benefit when receiving a contemporary based training before a contemporary rehearsal and that they valued training in both ballet and contemporary technique to support their work. As a result, this feedback encouraged the further pursuit of integrating the two techniques for the remainder of the project.

What I found to be the most successful application in this first month, was the introduction of the different intensity levels. In the survey the dancers were asked if they could perceive a clear difference in the levels of the classes. To this 72% of the dancers answered that yes, the difference was clear, 21% answered that they felt a difference but it could be greater, and 7% answered that it was not clear. In this regard, I also observed that the class had a tendency to build momentum and a class that had started intended as L2, the dancers may push to conclude in L3 or 4. Although the components of the exercises may be designed with a lower difficulty in mind, the dancers would often push through varying content for increased difficulty and repeating exercises in several groups. This made it possible to say that the level of the class is set as a guideline through the content of the exercises but individual choice in how to engage in the class plays a large role in the resulting intensity of how one trains. I also received feedback that the dancers appreciated being informed in advance of the class as to what type of training content was planned, which gave them a better possibility to prepare. As well, the use of recovery L1 to L2 classes following intensive evening rehearsals and performances was found to be successful. This reduction in intensity can be seen in two clear examples. The first being on 12.09.2020 when a L1-2 B-c class was given at the end of the week and following an evening rehearsal finishing at 22:00. The second example was on the 25.09.2020, when a L1-2 C/B class was given following an evening performance. The calendar below helps to view these examples and in relation to the entire month of September. In the calendar, free days are listed in green, performances in yellow, and the trainer for each class is listed as either B.M. for the ballet master, or as J.L. for myself. Each day has the span of the working hours listed either 10:00-18:00 or 10:00-22:00 to understand the working times of each day.

7.7 September working calendar

SEPTEMBER 2020

SUN	MON	TUE	WED	THU	FRI	SAT
		01	02	03	04	05
Free Day	Free Day	10-18:00 B.M. L3, B	10-22:00 B.M. L4, B	10-18:00 B.M. L4, B	10-22:00 B.M. L3, B	Double performance 1st Training B.M. L2, B 2nd Training J. L. L2, B
06	07	08	09	10	11	12
Double Performance 1st Training B.M. L2, B 2nd Training J.L. L1, B	Free Day	10-18:00 B.M. L3, B	10-22:00 B.M. L4, B	10-18:00 B.M. L3, B	10-22:00 J.L. L3, B-c -Strength trainings, cardio anerobic	10-18:00 J.L L1-2 B-c -Proprioceptive training, flexibility
13	14	15	16	17	18	19
Free Day	Free Day	10-18:00 J.L. L4, B -strength training, cardio anerobic	10-22:00 J.L. L2, B -neuromuscular coordination	10-18:00 B.M. L2-3, B	10-22:00 B.M. L4, B	10-22:00 B.M. L3, B
20	21	22	23	24	25	26
Cinderella Performance B.M. L2-3, B	Free Day	10-18:00 B.M. L3, B	10-22:00 J.L. L2, B -neuromuscular coordination	Cinderella Performance B.M. L4, B	10-22:00 J.L. L1-2, C/B -recovery, movement economy, flow	10-14:00 J.L L3-4, C-b -upper body strength training
27	28	29	30			
Free Day	Free Day	10-18:00 J.L. L3-4, B -Strength training, target rotators, adductors, stabilization	10-22:00 B.M. L4, B			

LEGEND:
Ballet Master - B.M.
Jacqueline Lopez – J.L.
Training intensity – Level 1 (L1), Level 2 (L2), Level 3 (L3), Level 4 (L4)
Training style – Ballet (B), Ballet with contemporary (B-c), Contemporary Ballet (C/B), Contemporary with ballet (C-b), Contemporary (C)
Performance
Free Day

Figure 16: September 2020 working schedule and class calendar

7.8 October 2020

In October, the focus for the dance company shifted from more classical programming to work based in contemporary with the staging and performances of *Anatevka* and the new production, *Rotkäppchen*. A primary focus for the classes in October was to support the dancers in the contemporary choreography. Following the last performance of *Cinderella*, the classes

adapted to contain a greater volume of contemporary content while maintaining a balance with classical technique over the course of the week. The classes ranged from B to C-b and aimed to connect content and movement principles from one day to the next.

In the feedback based from the survey results that I received, 75% of the dancers said they felt that the additional contemporary components within the classes helped them within the rehearsals, and 25% answered that it somewhat helped. Additionally, 50% of the dancers felt that the amount of contemporary did not negatively impact their ballet technique, while the other 50% answered that it might have affected their ballet technique but that they did not mind because the current choreography was not ballet based. In an effort to keep a rounded balance of the technical training, a classical ballet class was given at least once per week, and the range from ballet to contemporary was varied over the remaining days. The classes continued to follow the structure of the ballet class, starting with a build-up of technical exercises at the barre and progressing to center exercises, which in the case of a C/B or C-b training, often incorporated components of floor work. As each individual dancer has their own preferences, I observed them engage in the range of classes in different ways. The preference of the dancer became evident in their eagerness and support for certain styles, which I noticed to be a positive influence in the environment amongst the group. In general, as some dancers became enthusiastic, other dancers appeared to be encouraged to follow their energy and created an open and united atmosphere. I also received feedback from dancers that the variation of the style of the classes helped to keep the class feeling fresh. In this way, the classes remained dynamic enough to keep the focus and engagement of the dancers by offering some variance.

In October, fitness integration continued in particular for strength training and neuromuscular coordination. This was achieved through dance specific training components built within a traditional exercise. For example, within a barre exercise a sequence of *plié* to *relevé* with extension to 45° *derrièr* in varying volume of repetition was inserted. This targeted the dancer's strength of the supporting leg for *relevé*, jumps, stability and coordination. Another strategy was to include a specific conditioning portion of up to 10 minutes to the warm up or the end of the barre. This conditioning often targeted abdominals, obliques, back, hamstrings, and adductors. Exercises such as; various trunk curls, plank holds, side plank, back extensions, bridge, hamstring curls, and side scissors were incorporated (Haas J. G., 2018).[26] Aerobic training was unfortunately never achieved. Upon consideration of the changing

[26] Jacqui Green Haas, Dance Anatomy (2nd edition), USA, 2018. This publication offers dance specific conditioning exercises for targeted areas of the body. Strengthening exercises were primarily taken and adapted from this book.

working times and intensity, I determined it was not feasible to successfully integrate. However, cardio and endurance were incorporated through anaerobic training by using longer duration of allegro and increasing repetitions of the exercises while shortening the recovery time between exercises. In these days the intensity of the training would range from L3-4 based on the energetic requirements.

7.9 October working calendar

OCTOBER 2020

SUN	MON	TUE	WED	THU	FRI	SAT
				01 10-18:00 J.L. L1-2, B-c	02 10-22:00 J.L. L3, B -Anaerobic allegro	03 10-14:00 J.L. L1-2, B-c -gentle, recovery
04 Free Day	05 Free day	06 10-18:00 B.M. L3-4, B -Cardio	07 10-22:00 J.L. L2-3, B-c -conditioning	08 10-22:00 J.L. L 3-4, B-c Core strength, Cardio	09 Cinderella Performance B.M. L4, B	10 10-22:00 L2-3 C/B -contemporary principles introduced
11 Free Day	12 Free Day	13 10-18:00 B.M. L3, B	14 10-22:00 J.L. L2-3, C/B -Neuromuscular Coordination	15 10-22:00 J.L. L3-4, C-b -Strength for core and upper body	16 10-22:00 J.L. L2, B-c	17 Anatevka Premier J.L. L1-2, C/B (90 mins) -contemporary principles
18 Anatevka J.L. L2, B-c	19 Free Day	20 10-18:00 J.L. L4, B Strength and conditioning	21 10: 22:00 J.L. L3, B-c -Cardio	22 Anatevka Performance J.L. L3, C-b -Strength for core and upper body	23 10-22:00 J.L. L2, B-c Proprioception	24 Anatevka performance J.L. L2, C-b -contemporary principles
25 Free Day	26 Free day Holiday	27 Free Day, compensation day	28 Split 2 working groups / corona measures 10-14:00 Group 1 18-22:00 Group 2 J.L. L1-2, B	29 Split 2 Working groups/ Corona measures 10-14:00 group 1 18-22:00 Group 2 J.L. L2-3, C/B -strength core	30 10-22:00 J.L. L3, C/B Neuromuscular coordination, cardio	31 10-14:00 J.L. L1-2, B (45mins)

LEGEND:
Ballet Master (B.M.)
Jacqueline Lopez (J.L.)
Training Level: Level 1 (L1), Level 2 (L2), Level 3 (L3), Level 4 (L4)
Training classification: Ballet (B), Ballet with contemporary (B-c), Contemporary ballet (C/B), Contemporary with ballet (C-b), Contemporary (C)
Performance
Free Days

Figure 17: October working schedule and training calendar

7.10 Novemeber 2020

November was an unprecedented and unexpected month for the dancers at the Oper Graz due to the Covid-19 pandemic. Results from the weekly testing found positive cases within the dance department. Due to the regulations at that time, it automatically placed our entire department into a 10-day quarantine from 05.11.2020-14.11.2020. As an effort to keep the dancers active and support morale the director discussed with the ballet master and myself to offer classes online. During this time, I offered voluntary ballet class 5 times and additionally gave a 45-minute conditioning class and a guided improvisation session.

It is fair to say that the conditions for the training were not sufficient to allow for any form of progressive training being faced with poor internet connections, limited space, poor flooring, and poor audio quality. It was not possible to offer challenging combinations or ask the dancers to push their physicality. We worked within our limitations and aiming to stay together as a group and feel united through the situation. Following the quarantine period, the Theater Holding Graz decided to close the operations within its theaters for the period of the lockdown that had been implemented by the government. This meant that until the end of the 1st week of December work was cancelled as well as the upcoming premier and the performances of *Rotkäppchen* were rescheduled for Fall of 2021. At this point the continuation of the project was no longer possible. I continued to give the dancers online classes for the remainder of my working contract, but no longer recorded data or integrated training aims.

7.11 Reflections on the research period in fall 2020

In this first research period at the Oper Graz, the practical work revealed several applications and strategies needing adjustments while other parts slid seamlessly into place and created a supportive and beneficial aid to the dancers training. Starting first from the aspects that proved to require reconsideration, it was a known variable from the beginning but the multiplicity of the classes being given from two instructors, created an inconsistency which made the ability to fully shape the training out of grasp. In order to minimize disruption in the build-up and reduction of training with regards to periodization, tapering and introduction of training stimulus, the classes should be led by one or more trainers who follow the same training principles and applications. Another factor that diminished the results was the reduced duration of the project. Ideas and applications had only started to be developed with the dancers before the working situation was restricted and when projecting the results of the most productive month of October over a larger scale, it can be inferred that a considerably longer

period of time would be required to offer more conclusive results. It would therefore be my suggestion that for a project of this magnitude, a time period of minimum 6 months could allow enough accumulation of feedback to produce more conclusive results.

In the original outline of this project, the use of periodization was mentioned but it had already been determined that due to the structure and organization of the theaters planning, that it would be impossible to properly apply this training principle. It remains an unyielding variable which constrains efforts to improve the conditions for the dancers. A major issue is created by working split days, particularly in alternation with working through days. The schedule and rhythm of the working week spikes and dives irregularly and in turn creates irregularity in sleeping patterns, eating habits, length of rest periods, and periods of the day when the body is being taxed. In consideration of circadian rhythms and chronobiological factors, research suggests that physical activity especially for athletes should be avoided very early in the morning or late in the evening (Reilly, Atkinson, Gregson, & Waterhouse, 2006). It has been found that exercise in these time periods is performed with increased difficulty and in particular with increased breathing difficulty. Another issue in working split days is the need to warm up twice. After a long break period, the body requires considerable time to warm up again which is often insufficiently executed for the physical requirements of the rehearsal or performance and leading to increased risk of injury (Simmel, 2014). Personal time is also affected in split days, caused be the need for two commutes to work in one day and maintaining a balanced lifestyle outside of the workplace can be challenging. Split days also create challenges for a healthy eating and sleeping routine through irregularity and unconventional timing. In discussion with the dancers about their typical routine on split days, many commented that they find it difficult to eat more than a snack before the evening rehearsal and that they are often hungry throughout. Some dancers also mentioned that they have a hard time to sleep so shortly after eating late in the evening and they end up having reduced quality of sleep. The National Sleep Foundation of the USA states that adults need between 7-9 hours of sleep per night (Hirshkowitz, et al., 2015). But an active lifestyle may demand greater rest for the body to recover from fatigue. Sleeping habits also contribute greatly to the benefit of the rest and it is recommended to maintain the same sleeping schedule every day of the week. “In otherwise healthy adults, short-term consequences of sleep disruption include increased stress responsivity, somatic pain, reduced quality of life, emotional distress and mood disorders, and cognitive, memory, and performance deficits” (Medic, Wille, & Hemels, 2017). Routine quality sleep has been shown to be essential to a healthy lifestyle and even more so for people who are active, yet the working conditions of the dancers are such to make this basic need of

rest difficult to achieve. So why does the schedule vary in this way? Why is working in the evening hours, which has been shown to have a higher risk of injury, decreased performance capacity, and interrupt eating and sleeping patterns, a part of the practice of the theater? This answer has multiple layers but a predominant reason belongs to the tradition of performing in the evening. Some departments at the theater perform more often than others and while working split shifts may even be beneficial to an Opera singer to rest their voice, for a dancer working athletically, it comes with increased risk and reduced performance. In Austria night work, holidays and working on Sundays also receives a tax reduction[27] (WKO, 2024). Should the artists collectively push for a change in their working conditions and follow a working through schedule, they would find their income impacted through taxation.

Another aspect which calls for more development is defining the different intensity levels of the class. It was brought to my attention from reading the feedback of one dancer who explained that they believe that certain exercises or aspects of movement are more challenging for them than for others. How can the training in the class be set to target a certain level when we are in group? The individuality of the dancers means that they will not all have the same experience. Despite this, being aware of how the content and structure of the class influences the difficulty, offers a strategy to attain certain intensity levels and so it should be questioned, what makes a movement challenging? Author of *Dance Kinesiology*, Sally Sevey Fitt, explains that when movements involving considerable strength are increasingly difficult when executed at a slow sustained pace, due to the fact that momentum at an increased pace can ease resistance and assist in action execution (Fitt, 1996). However, fast explosive movements such as *grand battement*, *grand jeté*, or movements that involve complex coordination of multiple muscle groups such as *grande pirouette* require a high energetic and effort output, which also increases difficulty in particular with greater volume of repetition. IADMS's resource paper *Motor Learning and Teaching Dance* explains that the use of space will also increase the difficulty caused by the muscular effort to locomote the body, to smoothly coordinate movements and manage transfers of weight (Wilmerding & Krasnow, 2009). Therefore, the elements of speed, duration, repetitions, use of space, muscular effort, and coordination attribute to the difficulty within movement combinations. In an effort to maintain a class at a lower level, L1 for example, means that certain movements or combinations may not be included.

[27] WKO clarifies that under most Kollektivverträge receive the benefit for working between 20:00 and 06:00, additionally the tax benefit is accounted for work in blocks of at least 3 hours between 19:00 and 07:00. From 2024 monthly this can account for up to 400€ of income tax free.

Over the course of September and October several aspects of the project found success in their application. Although it was met beforehand with a certain degree of skepticism, the blending of contemporary and ballet techniques was well received. I observed that it worked particularly well to range the class over the course of a week, allowing a gentle blending of exercises and technical approaches, which brought the two techniques together. In a B-c class for example, dancers were cued with contemporary principles of opposition, suspension, or fall and rebound. I changed the vocabulary I used to dictate the exercises and cross blended qualities and technical aspects from ballet and contemporary. As the class moved along the scale from contemporary to ballet and back again, each time the dancers seemed more readily available to reference and incorporate principles that had been practiced in the previous trainings. A major effort was made to break the boundaries between these technical forms. A ballet class still respected the classical technique but now the dancers had the proximity of contemporary underlining their movement qualities and approaches to the movement. The same could be said in the other direction, that technical approach was not disbanded at the 1st whim of contemporary class but rather more methodically approached and with the consideration of ballet principles in relation to contemporary technique. Had this project continued for a longer period of time, an even clearer framework for this blending of the techniques could have been established. Here I believe there is a large possibility for investigation and research to the application of these two techniques together. In this first application attempt, I followed guidance based from Paskevska's book, *Ballet Beyond Tradition*, as well as from my experience in training with other teachers[28] and my personal movement research.

In the basic approach to principles of periodization and tapering, efforts made to reduce training intensity before and after high intensity events such as performances or strenuous rehearsals was also well received. In feedback from the dancers, it was said that this helped them to recover and manage their energy levels. It was also new for the dancers to receive fitness training within their daily training and this was also well supported. In fact, the majority of the dancers felt they would like to have more of this type of training. During the project, I was approached by the ballet speaker representative who asked me if I might consider offering

[28] Particularly influential teachers whom I trained with that guided classes based from ballet and contemporary technique include: Heidi Vierthaler (director/founder of Stream-Flow technique and former dancer of Forsythe Company and Göteborgs Operans Danskompani), Stefan Laks (former rehearsal director Göteborgs Operans Danskompani, choreographer and dancer with Les Grands Ballets Canadiens, Ballet Bern and Göteborgs Operans Danskompani), Tilman O'Donnell (choreographer and former dancer with Cullberg ballet, Staatstheater Saarbrücken and Forsythe Company), Elvis Val (freelance teacher in Spain and Germany).

an additional 15 minutes of fitness oriented training before the start of class, as there was a high interest from the dancers to further this application but recognized the time constraint of a 75-minute class. Unfortunately, this was never possible due to the Covid-19 situation but it demonstrated the interest of the dancers to improve their overall fitness level. In future applications, it would be beneficial to have the possibility of a longer training session and with this additional time, fitness training could be incorporated without the time pressure created in trying to maintain a balanced class. I observed that the integration of strength training, neuromuscular coordination and proprioceptive development fit fairly seamlessly into the structure of the class. Some dancers took self-initiative and tried using wrist and ankle weights in different portions of the class. One of the benefits to training in this way is the feedback signals the body receives while wearing the weights which cues the body to connect through the center. They wore 1 Kg weights which is still enough to be affective as the weight is being held away from the center of the body while in motion. This small addition of weight to the wrists or ankles proves to add a considerable stimulus by reason that, "if the muscle must not only move a given weight, but while contracting for this operation, must also lift the weight through space, it is put under greater handicap. It is stretched by the weight and must contract against the tension… as a result, the muscles must contract more powerfully, and more of the muscle fibers are brought into action" (Todd, 1937, S. 63). This simple application of the use of light weights during regular training served as an intensified stimulus. Other possible applications that would have been the next development, include the use of resistance bands for strengthening and stabilization exercises performed on exercise matts.

Whether the dancers were scheduled to have strength training, cardio work, or a simple recovery training, the communication of the type of training in the days before was appreciated by the dancers. A detailed weekly schedule was posted for the dancers every Friday and included was the training level, type of fitness training and style of the class. In this way the dancers could see an overview of their week to come mentally and physically prepared. I received feedback that this was helpful for them to plan their supplementary training around the schedule I had proposed, to ensure they did not accidentally double their cardio training in one day, for example. This application was even supported by our pianist who commented that he also prepared different music for the different styles of training and appreciated knowing several days in advance.

After the 3 months of this practical project at the Oper Graz, it offered me affirmations and presented many questions. Certainly, it can be said that the adaptation to traditional training methods, through this first investigation, demonstrated promising results in benefiting the

dancers within their work and overall health. It also provided a perfect example of the dynamic and unpredictable nature of a practical setting and brought forth changes and surprises that theorization cannot account for.

7.12 Fall 2021 second project period at the Oper Graz

Following the first working project at the Oper Graz, I was searching for ways that the strategies and applications from the 1st working period could be improved. I also used the time between to reflect on what aspects were necessary and considered ways to streamline the approach. The second working period fell primarily under the same conditions as the first with a few notable differences. In 2021 the project started at the beginning of November, meaning that the company had already been working for two and a half months. There were also several new dancers to the company and these dancers were experiencing my strategies and applications for the 1st time. Another difference was the simultaneous setting of the guest choreographers new work, *Der Wolf* and the remounting of the ballet master's *Rotkäppchen*. This double rehearsal schedule meant that rehearsals for both productions often occurred simultaneously, working with one cast in the black box theatre and the other cast in the studio. This situation created a considerable number of rehearsals that I was leading alone and required additional preparation time on my part. The last particularly important difference was that all the training was given by myself for the 2-month period. In this sense, the second working period gave me a more realistic experience to the level of demand for the ballet master/rehearsal director under normal working conditions. As with the 1st working period, I looked at the season planning to have an overview of how many performances were scheduled and I again built class plans 1 week in advance and then adjusted the content according to live time conditions. I also continued to communicate with the dancers in advance of the planning for the training in regards to intensity, technical style, and fitness and training aims. These plans were constructed on the same training principles as in the previous year, considering workload balance with training aims.

At the start of the second working period, I decided to take a more rapid approach to integrating the various aspects to the training as the majority of the dancers were familiar with the training approach and the dancers by this point in the season had recovered their fitness and technical level post summer break. This decision was also taken as there were no classical productions planned and the dancers did not need to prepare point work, meaning the stylistic and technical requirements of the dancers did not call for daily ballet training. Already knowing

the choreography of *Rotkäppchen* and having researched the guest choreographer's movement language, I quickly integrated more range of contemporary training. I continued to vary the training from ballet to contemporary and would often use the same exercise from a ballet class and by changing certain dynamics or movement principles, the exercise would morph itself into a B-c or C/B exercise. I would then again take elements from that same exercise and transpose them into an entirely contemporary class, to give the dancers the experience of recognizing the same elements within a different context. I sought to break down the barriers of their approach and remove the borders that defined their concept of what was classical ballet or contemporary content. At the same time, I continued to find the moments within the training to integrate strength training elements and target neuromuscular co-ordination exercises. As with the 1st project, there was again no appropriate place within the schedule to introduce aerobic training. It was not feasible in such a short working period while addressing the remainder of the training topics in this application. Additionally, at this point in the season the dancers were in the midst of a heavy performance schedule and staging of new works, creating a heavy mental and physical work load. Introducing another training topic risked to great of a disturbance and outweighed the potential benefit.

In this second working period, it should also be noted that I simplified the system of recording a daily log. Due to the intensity of the rehearsals which also produced a considerably greater amount of preparation work for myself on top of preparing classes, I found that a simpler format was needed. I opted to write short hand notes within my regular teaching notebook next to the exercises and class plans. These notes recorded observations or ideas about the training. This was an instantaneous reflection to be later taken into consideration when re-giving certain exercises or training plans. This economized time to manage the greater work load. However, due to simultaneous rehearsals it was impossible to keep track of the entire workload situation of the dancers which varied depending on the rehearsals they attended. Therefor the decisions regarding training aims and class content could only be based upon the rehearsals I had attended and the observations of the dancer's condition in class. This would also be the case in many other dance companies where multiple rehearsal spaces allow for multiple rehearsals and a greater division of the dancers. In this situation it again impacts the effectiveness of progressive training and tapering in consideration with the work load, when the work load itself is not consistent for all dancers.

I was forced to reflect on another aspect in November 2021 when one dancer in discussion with me described their confusion in harmonizing the technical styles. This dancer was new that season to the company and came from a classical background. This dancer

described a sort of kinetic confusion, not knowing what they should prioritize in their technique and felt that aspects of their technique had to be compromised in this approach. This confusion could be rationalized in several ways, such as a resistance to a new approach or idea or less time adjusting to this new concept as they were experiencing new that season. It also could be a lack of systematic application as error from myself as the trainer. I decided then to reflect on what my purpose was in that moment. The ambitions within this research project and the work that I was hired to do there as a ballet mistress and rehearsal director. I felt that although I perceived a potential value in what I was offering, the application seemed too vague for some and it was not my intent to alienate or compromise the training for any individual at the company. With this, I reduced the application of harmonizing the techniques by returned to giving either a ballet class or a contemporary class. This was not a failure for at this point, but very helpful feedback that confronted the approach from the view point of one who does not understand or agree with it. This topic and a newly developed strategy will be discussed in further detail in the following chapter.

Perhaps the greatest challenge in the second working period was the workload as the ballet mistress and rehearsal director. In this role, I was entrusted with an increased amount of responsibility in preparing new casts of dancers, leading rehearsals and the full load of daily classes over the 2 months. Prior to the start of the research, I viewed the challenges of training dancers from the perspective as a dancer, seeing the areas in the class work that didn't represent the actual performance work. After transitioning into this role as ballet mistress and rehearsal director, the perspective shifted to understand the capacity of an individual in a highly demanding role under considerable pressure and stress without a clear regulation on working hours. Due to this, despite my best efforts to maintain the research plan as outlined, the sustainability of the workload proved to be out of balance. This as well as the training applications will be under further review in the following chapters.

8. Bridging Movement Practices: Building connections between ballet and contemporary technique in training

In the previous chapter, the two working periods at the Oper Graz were discussed. Following these working periods, a great deal of reflection was made. The results highlighted an inefficient system with inconclusive results. The goal was to develop impactful applications that strategically improved the correlation between training and choreographic demands, yet particularly in the area of adapting the technical style, the applications were not user friendly. This result needed greater reconsideration to achieve the core essence of the goal and how it could be better transmitted to the dancers.

Looking back to the work of Anna Paskevska, we are reminded that the main approach is understanding how the movement principles of Limón technique exist within the technique of ballet. In considering this, we can relate that all dance forms are connected through shared movement principles of the body. This simplicity serves as the root for translating the connectivity between ballet and contemporary technique. Through these reflections I developed a concept of using shared movement principles as bridges to connect the technique and knowledge of ballet and contemporary. Although it is a similar concept to that of Paskevska, a primary difference lays in the cross application. Paskevska applied the principles of Limón technique solely to ballet whereas bridges can be applied to training bi-laterally with movement principles spanning both directions between ballet and contemporary. These bridges are to be considered as tools for a specific approach rather than a method or technique. As tools, they offer an interconnection and support to the dancer's training by widening the perspective of their approach and offering strategies to problem solve. This approach seeks to develop the versatility of dancers through an ease of exchange between their techniques, allowing them to be better prepared for the variety of choreographic demands they encounter. This chapter will discuss the concept and development of the bridges in connection with an additional movement practice. The practical work developing the ground work for this concept will also be discussed.

8.1 Bridge categories

The bridges have been divided into 5 categories: aligning, weight, opposition, succession and articulation, and spiral. These categories were devised to encompass the

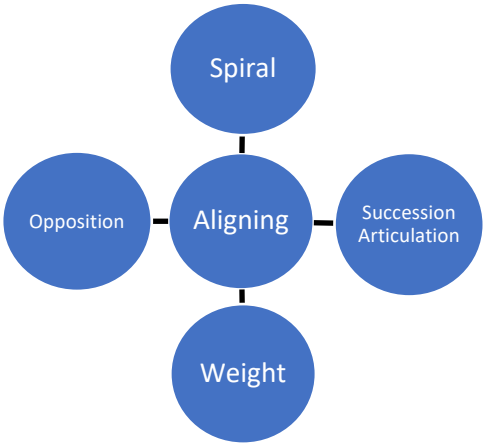

Figure 18: Bridging categories.
Created by the author.

movement range of the body in relation to their cross applicability to ballet and contemporary technique. These categories are all interconnected through shared properties and are co-involved in movements. The diagram at the side highlights the 5 bridges and a constellation which describes their relationships. Spiral is an action which requires the activity of both opposition and successive articulation in body parts. The concept and use of weight is applied through oppositional forces while it also acts as an initiator to successive movements. Individual properties of the bridges also overlap with each other making the application of the bridges multilayered as movements become increasingly complex. Having now introduced the 5 bridge categories, another method must be introduced before discussing the description and application of the bridges, as it serves as a supporting foundation and informant to how the work was developed and applied.

8.2 Supporting role: a foundation in Bartenieff's fundamentals

During the time of developing these concepts, an underlying support was sought out to aid as a foundation to inform the development of this work. This led to the consideration of other movement practices where a great importance lay on movement principles. In investigating Gyrotonics, yoga, the Franklin Method and somatic practices, there continued to be a barrier. Either there was an established technique specific to the practice or as is the case with somatic practices, there is a reductionist aim that leaves a gap between method and application to ballet and contemporary. Co-Author of *The Body Eclectic*, Rebecca Nettl-Fiol, describes such an example with Alexander technique, suggesting that the format doesn't fit to be incorporated in dance class because in dance we engage in the act of doing and through Alexander technique there is the investigation of producing less in a sort of non-doing state of body (Bales & Nettl-Fiol, 2008, S. 102).

Figure 19: Irmgard Bartenieff.
© Laban/Bartenieff Institute, in accordance with the copyright policy.

Each of the considered practices have an identity of their own, making them problematic to use as a foundation practice to ballet and contemporary technique. However, looking at the work of German born physical therapist, Irmgard Bartenieff, it offered potential for this purpose. Bartenieff had been a dance student at the Rudolf Laban school and performed with Tanzbühne Laban. Bartenieff also became active as a choreographer, dance therapist, teacher, dance historian, and dance ethnographer (Wiesner, 2017). In researching Bartenieff and her work, what was apparent was her abundant interest and passion for movement and the well-being of her students which underlines the theories and practice she developed. Having been a student of Laban, Bartenieff brought a whole-body connectivity to the Laban theories of *Body, Effort, Space, Shape*, which through her value of internal connectivity in body patterning, is said to have brought an enhanced aliveness to the movement expression (Hackney, 2002). Bartenieff's approach also solicits a holistic approach, considering the body as one system. In the book, *Making Connections*, written by Bartenieff's student Peggy Hackney, she quotes Bartenieff,

> "There is an interrelationship of all body parts in any movement. The whole body participates in any movement: different parts either serving as movers or supporters of movement. You must remember that the total body is changing: see the total constellation change when you change one thing." *(Hackney, 2002, S. 40)*

Bartenieff's work was centred around movement patterns of the body and movement principles practiced through fundamental body work. This work translates to a neutral training foundation and source of knowledge to support the applications of the 5 bridges.

8.3 Bartenieff's movement principles and fundamentals

Bartenieff's work was first developed through her research with polio patients. From there, the work crossed over to applications in various movement fields and dance. Hackney describes Bartenieff's developments as a response to the needs of the individuals she worked with and as a problem solving application with adaptability to fulfil those needs. Though this deterred the establishment of a fixed technique, it instead offered an approach and application to problem solving that is described through Bartenieff's movement fundamentals (ibid, S. vii). The Bartenieff fundamentals are therefore not a set structure of exercises but range in application. The exercises offer a body training that establishes connective movement patterns through "principles of efficient movement functioning within a context which encourages personal expression and full psychophysical involvement" (ibid, S. 31). There are 12 principles that guide the Bartenieff fundamentals, 6 of which are particularly applicable to dance

movement and will be used to directly support the bridging topics. They are listed as follows: total body connectivity, breath support, grounding, intent, complexity, and stability/mobility. Each fundamental will now be described and the connections to the various bridges.[29]

Total body connectivity is Bartenieff's principle of acknowledging the interconnective relationship of the individual parts to the whole. This enlightens one's capacity for differentiation of parts or integration, while relating to the consequence of the total composition. This principle is effective in problem solving. For example, in addressing an issue with pelvic alignment, by repatterning the connective pathways using oppositional energy traveling down through the floor and away through the top of the head, the pelvis finds greater support and allowing for greater ease to establish functional placement. This principle can be applied in all movement situations and will support all of the bridge topics.

Breath support is Bartenieff's principle that the breath is the physiological support to life and all its functions including movement. The act of breathing is a movement internally sensed and perceivable externally. Breath creates fluidity, serving also as an effort regulator assisting in the easing or controlling of movement and it can shape the dynamic phrasing of movement sequences. Through use of the breath, one can calm the body and mind, deepen one's focus, or become invigorated and energized. The application of this principle is essential and ever present. It too plays a constant role in all movement and can be applied to all the bridges.

Bartenieff's principle of grounding is a very present idea in modern and contemporary technique but the perspective used in Bartenieff's work makes it more readily accessible when considering classical ballet. Bartenieff views grounding as a relationship of the moving body to the earth and gravity, and highlights how the earth offers the body support. Grounding has a strong relationship to the bridging topic of weight, as grounding is said to offer us a sense of our own weight which in turn makes it possible for "our assertion of strength and lightness," but also through contact to the ground it is possible to be, "yielding weight into the earth and feeling an outpouring of flow which is met and matched by the earth as it provides support" (ibid, S. 41). Socially the concept of being grounded implies that one has a secure sense of themselves without overinflation and it is made possible through the relationship of one's weight to the earth.

In intent, Bartenieff suggests that connections are influenced through intent. By signalling the body through the neuromuscular system the way in which to achieve the desired motor

[29] The Bartenieff Fundamentals and her principles were primarily studied through the literary source, *Making Connections: Total Body Integration Through Bartenieff Fundamentals*, by American author Peggy Hackney, published in New York by Routledge publishing in 2002.

pattern, intent acts as a guide to initiation and a roadmap to movement execution. In this principle the soma and psyche are in constant relation. Through the presence of the psyche, the intent influences the way in which a person moves, giving rise to individual movement attitudes. Bartenieff viewed this through the Laban analysis system of body, effort, shape and space, where to each category, intent plays a different role. In shape, for example, it is suggested that intent forms the desired shape in which the body through movement will reveal. In the case of body, the intent suggests the clarity of where the movement initiates from and how the movement follows through. In this situation we see that intent will have a strong relationship to succession and articulation. However, if we consider the intent in effort, Bartenieff describes this as having an expressive quality which can be translated into dynamic movement in which we also involve the use of aligning to achieve a certain body attitude through one's posture. It also is involved in carrying out an action through its connection to weight and opposition. This principle is therefore an essential tool in the integrity of movement execution and can be applied to all the bridges.

The following principle is complexity, which recognizes the body as a highly orchestrated instrument, producing multifaceted movements through a web of interconnected principles. This suggests that the approach must also be multifaceted to encompass the entirety of what occurs in producing movement and in facilitating motor solutions. Bartenieff states, "It is through awareness of the multiple possibilities at any one moment in time that we can offer students and clients a range of options for an individualized change process" (ibid, S. 44). This principle aids us to consider movement and the body from many perspectives and in particular to avoid over isolation of individual parts. This serves to guide the application of using bridges by not limiting one's range of possibilities in the approach.

The final principle in consideration is stability and mobility which are two concepts that interact to produce efficient and optimal movement. This is achieved through an active connection from core to extremities and returning to the core. Core being defined as the body's centre of mass located in front of the lumbar sacral junction and level with the second sacral vertebra. This point intersects the 3 directional planes of movement in an imaginary division of the body (Bales & Nettl-Fiol, 2008, S. 144). This active connection is translated into the principle of grounding to create stability or mobility through one's intent leading to movement action. In Bartenieff's experience it was noted that tension can arise in external musculature which falsely mimics stability but in fact inhibits mobility. This can also be described as hypertension where a static contraction of muscles to bones creates an illusion of security that can occur in various body parts such as; the jaw, neck, shoulders, and pelvis. This muscular

holding blocks movement, restricts breathing, affects adrenaline, and can raise one's centre of gravity (Todd, 1937, S. 275). It is suggested that "mobilizing a connective pathway from the limb through the proximal joints into the core will release tension around the joints, allowing even deeper connections through the core to emerge. This will in turn bring greater stability, and the individual will feel safe to move with more mobility" (Hackney, 2002, S. 46). This connectivity is a dynamic process being continuously renewed and therefore corresponds to aligning, but stability and mobility is an underlining principle guiding all bridge categories to develop effective and efficient movement.

These principles are a selection of principles that guided the methodology of Bartenieff fundamentals. The fundamental exercises themselves were developed as a tool for one to develop a deeper awareness in their body, improve expressivity through movement, create solutions for mobility hindrances and gain a greater confidence and pleasure through movement. The fundamentals are practiced in 6 essential movement patterns. These movement patterns are at the base of all movement in the body serving as an analytical tool in movement analysis.

8.4 Bartenieff's movement patterns

Figure 20: Breath Pattern ©Jeffery Scott Longstaff, in accordance with Wikipedia copyright policy.

Bartenieff describes the most essential and instinctual pattern as that of the breath. A cyclical pattern of filling and emptying, exchange and flow. A part of our autonomic nervous system, it is occurring automatically, but can be influenced and altered by conscious thought or emotional changes. Although it is inherently always occurring, the efficiency of breathing can be undermined for reasons such as; acute trauma, emotional state, negative motoric habits, environmental conditions, illness, or physiological conditions. It is suggested that to receive the full benefit of one's breath, more attention should be placed on this pattern. It has the capacity to invigorate and revitalize one from a state of fatigue, to calm and centre one's ideas and consciousness, to alleviate stress and anxiety, to assist in healing and recovery, to increase one's range of mobility, and to establish greater stability. The breath pattern is for Bartenieff the first approach at solving patterning problems. "Wherever the breathing is blocked in the body, future patterns will be blocked; wherever the breathing is free, the future patterns will develop efficiently" (ibid, S. 52). This pattern is at the core of all movement supports all the bridges by facilitating effective execution and reduced restriction.

Figure 21: Core-Distal pattern © Jeffrey Scott Longstaff, in accordance with Wikipedia copyright policy.

The second pattern is core-distal, which describes the connection between the one's core and extremities. The pattern is describe as expanding outward and gathering inwards to the centre. It resembles the pattern of breath but the core-distal pattern changes from a circular pathway into the directional pattern of in and out described as a star for its trajectory from the centre to the legs, arms, head and coccyx. This develops greater connectivity to the limbs and a greater complexity and articulation of movement arises. This pattern supports all of the bridges but is most easily connected to opposition.

The following pattern is the head-tail pattern which describes the connectivity of the spine. Bartenieff notes that how one holds their spine is directly connected to body attitude and creates strong perceptions from outside viewers on the characteristics of that individual. Bartenieff suggests that a considerable number of motoric inefficiencies are derived out of a lack of connectivity in the spine and that establishing a strong connection from head to tail produces greater control in movement and fortifies the relationship between mind and body. The spine itself, consisting of 33 vertebrae, has the function to protect the spinal cords and structures of the nervous system, support the body and facilitate movement through flexion, extension, rotation, and side bending (Calais-Germain, 1991). As the cervical, thoracic and lumbar spine individually have different ranges of motion, the flexibility of the spine, which is also determined in part through genetics, age, and sex, is not continual through its entire length and in certain movements it can result in a restricted sensation in the body. This restriction or blockage can create difficulties in sensing the connectivity of the spine and requires particular attention to the development of fluid patterning from head to tail. In doing so, Bartenieff suggests that one's range of motion improves, body attitude is influenced, and movement execution is optimized. When we consider any of our bridges, the head-tail pattern plays a role.

Figure 22: Head-Tail pattern © Jeffery Scott Longstaff, in accordance with Wikipedia copyright policy.

Bartenieff's fourth pattern is upper-lower body and divides the body at the transverse plane. This pattern develops into the extremities and the individualisation of both upper and lower body segments for their specialized skills and roles in developing functional movement. However, in this pattern the aim is not to polarize the body into upper and lower, but to individualise action in order to better support the action of the other. Inside this pattern,

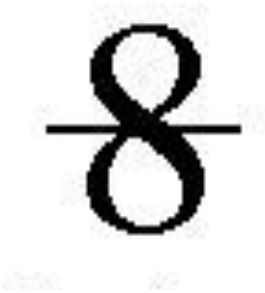

Figure 23: Upper-Lower pattern © Jeffery Scott Longstaff, in accordance with Wikipedia copyright policy.

movement is developed cohesively as homologous movement through a specific pattern Bartenieff calls yield and push/reach and pull (Hackney, 2002, S. 113). Yield and push pattern creates grounding and produces length while reach and pull pattern holds spatial intent, builds connectivity with the centre, and uses length to draw energetically inward. This pattern involves full bodied movement and the complexity and the range of possibilities becomes countless. Therefore, the upper-lower body pattern will be strongly connected to the bridges; opposition, spiral and succession and articulation.

The pattern of body half examines the body divided at the medial plane where movement is examined from a left and right side perspective and in homolateral movement. In stages of development, the body forms dominant actions assigned to the right and left, forming individualisation of skills for each body-half and in which a stabilizing and mobilizing dominance takes form. This relationship is interdependent and is suggested that, "When highly articulated, differentiated movement is a issue, one cannot achieve greater mobility without first achieving greater support for stability" (ibid, S. 166). Should we consider a body-half movement pattern such as *grand rond de jambe*, this statement places the focus into the stability and support of the standing leg in order to facilitate the mobility and action of the leg performing the *grand rond de jambe*. For a dancer, the dominant side may become the preferred side for certain skills but it is important through training to seek a greater balance in body half dominance. In this aspect, Bartenieff has used this pattern to promote balanced development of both body halves. In particular when the topics of opposition, aligning and weight are addressed in movement, there is a strong relationship to the body-half pattern.

Figure 24: Body-Half pattern © Jeffery Scott Longstaff, in accordance with Wikipedia copyright policy.

Figure 25: Cross-lateral pattern. © Jeffery Scott Longstaff, in accordance with Wikipedia copyright policy.

Bartenieff's final pattern is the cross-lateral pattern and is the most developed and complex within the body. Here movement is facilitated through diagonal cross-quadrant connections of body-half and upper-lower by passing through the central core. It comes as the last stage of pattern development in humans as one learns to crawl and then later to walk. In these instances it facilitates transferring weight and therefor locomotion of the body through

space. As complexity of movement and coordination increases, cross-lateral patterning becomes increasingly involved. For dancers, this pattern in connection with other patterns, allows for complex chains of movements in smooth and controlled execution. By utilizing this pattern effectively, greater stability and mobility is achieved by creating an active connection passing diagonally through the core to the extremities. This pattern underlines the majority of movements in both ballet and contemporary through actions like spiraling or *grand jeté*. As opposition, aligning, spiral, and succession and articulation are discussed, the role of the cross-lateral pattern supports the application and understanding of these bridges.

Bartenieff's 6 movement patterns are the base of all connective movement produced in our bodies, either alone or in combination. When movement complexity begins to produce inefficient movement execution, returning to these patterns re-establishes the connectivity needed for effective movement. As we now look individually at the 5 bridges, the knowledge in Bartenieff's patterns and movement principles, supports our understanding and application of our bridging topic in practice.

8.5 Integrating bridges from theory to practice

The 5 bridges; aligning, weight, spiral, opposition and succession and articulation all facilitate a dancer's connection between ballet and contemporary technique. Each of the bridges have principles that give rise to their character and application. During my research, I worked with three professional dancers from various backgrounds and dance experience during a 5 week work project in Aix-en-Provence, France. The dancers offered their voluntarily involvement and with the use of video recordings, noted discussions, feedback, and observations with the dancer's participation, all assisted in the development of the bridge applications. Over the 5 weeks a variety of integration exercises were developed to help these principles to establish in the body and allow the application of each bridge topic to be understood. These exercises begin as foundation exercises, used to familiarize one with the base principles, build connective patterning and practice each bridge topic in isolation. These

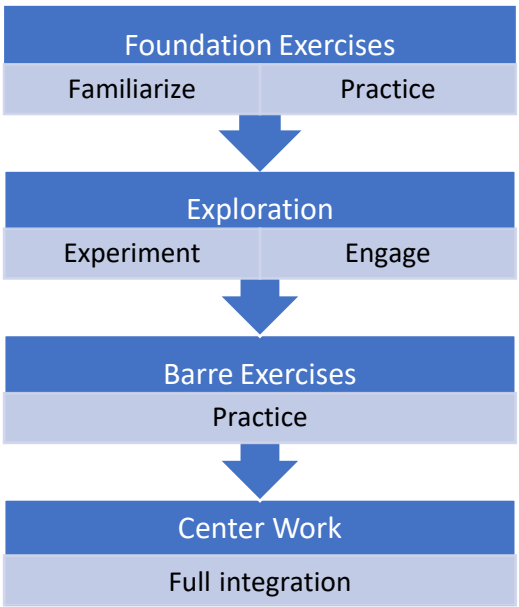

Figure 26: Integration process for bridge topics from foundation to full integration. Created by the author.

foundation exercises, similar to Bartenieff's fundamentals, build a base for more complex movement to develop. Following the foundation exercises, I worked with the dancers on various explorations that guide the dancers to experiment and explore the potential of each bridge. In this way, they discover the applicability of the bridges in more sophisticated movement. These explorations were also intended to offer a creative, stimulating and playful activity to increase the dancer's engagement with the bridges, in which they create their own relationships to the connections they form. The next stage of integration occurs through exercises at the *barre.* Now the exercises resemble the structure of a ballet class, offering a familiarity in the format, helping the dancers to keep their focus on the bridges. Although the main focus remains on individual bridges, already the complexity will advance and more than 1 bridge is often engaged at a time. The final stage of integration occurs in center work where movement exercises increase in complexity, calling on the action of various bridges simultaneously and in tandem. Now at this phase, the dancer needs to feel a comfortability and ease at accessing these bridges to connect smoothly and facilitate the speed and complexity of the exercises. This practice most realistically mimics that of choreography, where complex chains of movement are strung together. Once these bridges and their principles are well connected into a dancer's practice they can serve as tools as they encounter challenges in choreographic work and in deepening the connectivity of their daily class. Each bridge topic will now be investigated along with its integral connections to the work of Bartenieff.

8.6 Aligning

Aligning is a central bridge as it is a continuous action participating in all movements. Aligning is a concept introduced in the book, *The Body Eclectic*, and it replaces the static notion of alignment, which suggests something ridged and unchanging (Bales & Nettl-Fiol, 2008, S. 141). When we speak about alignment, it renders ideas of posture in fixed positions and alienates the very essence of dancing and movement. In reality, to be aligned, one must constantly make small adjustments to compensate for the everchanging structure of a body in motion. This activity of aligning brings an energized and alive presence to the body. This is supported by Bartenieff's principle of total body connectivity and breath support. Breathing is an endless cycle, creates subtle shifts within the body and a constant reorganization is always occurring. Aligning can be active internally and can also be viewed in terms of our relation to space and time. As we move, we change our relationship to our spatial environment and as it has a certain duration, we are aligning the execution of our movement to that desired duration.

When we are internally aligning the focus of our action is placed on muscular recruitment in support of our skeletal structure. It is often a key theme in ballet and contemporary technique as in the lateral and medial rotation of the hip combined with abduction or adduction of the thigh in extension or flexion. This is described as *en dehors* and *en dedans* or outward and inward rotation (Calais-Germain, 1991, S. 195-197). This internal aligning helps to support external aligning which we consider as the overall relationship of the body parts to the whole. An example of aligning in this context is the spatial relationship formed between the arms and the torso as the arms move in *port de bras*.

In my research with the dancers, I instructed them in exercises designed to engage these principles of aligning. We worked from investigating very small incremental adjustments in the body that occur through movement starting first laying down and then standing, building up to full range movements at the *barre* and in centre work. Some of the exercises were done with the eyes closed and all without the use of a mirror to deepen the dancer's sensation rather than relying on visual confirmation. Throughout this work, the principle that took hold in our focus, was Bartenieff's concept of viewing the parts of the body in constellation. A sort of 3D model of one's self made from points in space and visualizing the reorganization that occurs during movement. What I perceived in the dancers was a heightened awareness of their body parts, in particular, when working with the eyes closed. I also saw a comparable difference in their movements that occur outside of their line of vision, such as a leg extended into their back space or as the arm sweeps behind the body. In these moments, the dancers maintained a sensation and connectivity to their entire body and it could be suggested that their proprioception was well engaged. In other exercises, where we examined aligning at a more zoomed in scale, the dancers were asked to consider the re-organization occurring in the pelvis as they moved between inward and outward rotation. These exercises were designed with the intent to train transitional moments that pass between inward and outward rotation. While doing these exercises, by considering body-half patterning in combination with breath support, the movement took on greater connectivity and remained active. In working with the bridge aligning, I found that Bartenieff's principles of breath support and total body connectivity assisted in transmitting the concept to the dancers. In discussion with the dancers, a common experience was the effectiveness in tuning into their body placement through the activity of aligning and how considering their body half pattern, aided their experience in the exercises. Aligning can be said to be occurring constantly through a renewing active state. For this reason, I introduced it as the first bridge to allow it to continue to participate and be referenced during

the exploration of the remaining four bridges. For a concise referential video demonstrating the practice of these exercises with the dancers follow the web link listed in the footnote below.[30]

8.7 Opposition

The following bridge is opposition. This movement principle is one easily recognized in both ballet and contemporary technique and as such makes its application to facilitate their connectivity very practical. When speaking about opposition we can consider it in terms of energetic vectors in the body. One may sense energetically a grounding down through the supporting leg while energetically there is an elongating or expanding sensation through the length of the spine. Meanwhile, visually there is no perceivable movement occurring in space although the body appears engaged. These principles are well established in the Limón technique, where the body is viewed as having 5 points of opposition through the arms, legs, and crown of the head. Through engaging these oppositional points, the technique builds the sensation of lengthening while remaining supple and avoiding unnecessary muscular tension (Lewis, 1990, S. 42). We can also consider opposition in terms of movement in space, where body parts move in counter direction. As in Bartenieff's descriptions of core-distal, the idea of opposition is associated with going against something or moving away, which can produce a negative connotation. In reality, the relationship is symbiotic and possible through the cooperative participation of two active directionalities in what can be described as, expanding (outwards) or gathering (inwards). In Bartenieff fundamentals, this is expressed through the specific pattern of yield to push and reach to pull. When engaging the use of opposition, there is a stabilization and an increase in volume that the body occupies as it expands. This aids a dancer in controlling movements and expressing movement outwards. When one instead uses opposition to gather, it produces potential kinetic energy, compression and aids in movement pathway efficiency. If we recall the core-distal pattern, the center of mass or the core is the origin to this pattern, allowing the path of the pattern to always start and end through this central point of the body. This produces a circuit of connectivity that a dancer can readily access as they execute complex movements.

To translate these ideas to the dancers, we began by engaging Bartenieff's concept of envisioning the core-distal pattern as a pulsation that radiates from the core outwards through the body. We imagined this as a heat wave and also tried a more neutral sonar wave. In this

[30] Reference video for the bridge topic of aligning: https://youtu.be/zM2h2QDQ6hw

exercise, the dancers lay on the floor with their eyes closed and focus on their core, bringing their awareness to this point. They then begin to send these waves outwards from the core. They allow this sensation to arrive to the outermost extremities of their body before it returns back to the core. In time the wave intensifies and they sense it pulling their body physically in space as expanding outward and gathering inward. In discussion, it was noted that focusing on the core-distal pattern in this exercise helped to place a central importance on the connection to their core. Some dancers, had had the prior experience of sensing opposition from the outermost points of the body but that in doing so, they had lost the connection between the points of opposition. As we continued through explorations and exercises at the barre and center, the principles of opposition began to appear as a theme throughout all movement and offered itself as a means of improving movement execution generally. It was also through discussing the pattern of yield to push and reach to pull, that a vital part of the pattern created the mobilization of weight and in turn it reiterated that the bridges are interconnected and present simultaneously. Therefor it was a logical progression to lead into the following bridge topic of weight. For a concise referential video demonstrating the practice of the work done on opposition with the dancers follow the web link listed in the footnote below.[31]

8.8 Weight

In all movement, mobilization of weight is involved. The very act of taking a step, or standing from sitting, involves a transfer of weight, but we can also consider it as a displacement of weight, meaning a re-organization of the distribution of the weight in the supported structure of the body and creating the impetus for movement. As we start to investigate weight, we find that our sense of weight is a result of its interaction with laws of physics such as gravity and centrifugal force, and that weight is involved in producing momentum, acceleration and deceleration. When we consider weight from a dance perspective, we are brought to topics such as fall, swing, suspension, release, recover, dynamics, grounding, potential energy, and kinetic energy. Most of these topics are common language within contemporary technique but their involvement plays an equal role in ballet. However, Paskevska describes that the desired illusion of lightness and the aesthetic of ballet creates a disconnection from the recognized involvement of weight in ballet technique.

> *"In our language, we use the word "weight" to denote importance or deep meaning. Light (weight), on the other hand, often refers to something frivolous. Accentuating the quality of "prettiness" of particular movements tends to distance the dancer from the full visceral*

[31] Reference video on the bridge topic of opposition: https://youtu.be/urqQrPQW1WU

experience of the movements, and in effect trivializes the classical technique. In the pursuit of prettiness, the quality of weight is disenfranchised. Conversely, when weight is acknowledged and managed efficiently, the intent of the motion can be fully realized. Not only can character or feeling become evident, but the kinetic qualities of motions can be fully experienced and communicated. The harmonious fusion of light and weight depends to a great extent on the understanding of the impact managed weight can play in the execution of motions and in creating the aesthetic. Thus, awareness of the weight of our body affects the quality of all movements." (Paskevska A. , 2005, S. 77)

Paskevska describes that despite the efforts to create illusions about weight, ballet depends on a deep understanding of the use of the weight to achieve the most profound results from the technique. As a bridge, weight offers immense benefit by creating cross applications between the techniques. For example, in ballet to involve the weight of the pelvis in a balancé from the perspective of swing and recover as in contemporary or modern technique, produces a greater capacity for movement. The nature of swing involves weight through release, fall, recovery and suspension, resulting in a pendulum action of the weight full of kinetic energy in the moment of fall, and potential energy in suspension. The suspension itself produces the lightness most commonly associated with ballet aesthetic, but when considered in this context, it produces a more effective and connected result. The counter approach within a contemporary setting can also be applied, by integrating the management of weight as utilized in ballet for achieving greater control and elongated movements. These cross applications can be guided through Bartenieff's principle of grounding. Whether trying to achieve lightness or weightiness through movement, the physical weight itself remains in constant relationship to the earth as it provides the body with support and a connection with gravity. Keeping this relationship in focus and facilitating movement is the aim of weight as a bridge topic.

The bridging exercises introduced to the dancers started in a simple structure of mobilizing the weight of the pelvis by releasing into gravity followed by an active recovery by grounding through the floor to arrive into suspension. The exercise develops from this isolated point of initiation to develop into allowing the release and fall to initiate in other body parts such as the head, arm, or knee. Wherever the dancers sensed the pull of gravity, they were instructed to succumb to it and then to follow and guide the trajectory of their recovery. It also progressed from small movements to full embodied movements as the sensation of their weight in fall and recovery manifested. This exercise began as an open movement language, meaning there was no association to one particular technique, but as the dancer's range of movement increased, I asked them to guide their recovery by aligning the body into movements they associate with ballet technique, such as *tendu devant* or *retiré*. This was an experiment in building a connection between the activity of fall and recovery in the facilitation of movement

in ballet. The origin to this idea comes from my experience in 2010 working in the company of Canadian choreographer Martha Carter[32] who blended her background from ballet, contemporary and street dance into her work. As a part of Carter's warm up, she asked the dancers to explore the simple pattern of *plié* and *relevé* with improvised positions ranging from classical to neo-classical and contemporary. Carter would play strong rhythmical pop music and called this exercise techno-ballet. Although Carter's first aim was to open the creativity of the dancers it also served to awaken the dancer's connectivity through the floor as the percussive music called for a strong use of the weight given into the floor in the *plié* and pushed against the floor into the action of *relevé*. Similarly, the exercise I proposed uses the same pattern, but without a rhythmical boundary. The dancers listen to the rhythm of their weight falling echoed through their suspended recoveries to create the dynamic.

As we continued our focus on weight through various barre and center exercises, we discussed weight in comparison to a motor. The weight creates an impulse for the initiation of movement, either through a fall or displacement in space. Weight also produces a momentum, participating in the dynamics of motion that govern speed. Our weight also has the force inside it to either break momentum and stabilize through grounding, or drive the body into locomotion at varying speeds, qualities and tones. We discussed that be placing our focus into the concept of weight that the dancers felt a stronger capacity to move with agility and dynamics. I also observed that the dancer's connectivity to the floor was strengthened by seeing an increased activity in stabilizing and pressing through the floor. In association with weight the topic of succession arose and the connection between the bridging topic of weight with succession and articulation became apparent. For a concise referential video demonstrating the practice of the work done on weight, follow the web link listed in the footnote below.[33]

8.9 Succession and articulation

Articulation has two contexts when we discuss dance. There is the anatomical context, where articulation is the movement that occurs at the joint where two bones meet. The body is composed of 206 bones in 5 different shapes (flat, long, short, sesamoid, and irregular) that are connected by soft tissue to the next bone. The form of the joint determines the range of motion possible such as flexion, extension, and rotation (Haas J. G., 2018). Articulation also describes

[32] Canadian choreographer Martha Carter is the artistic director of Marta Marta Productions and prior rehearsal director to Compagnie Marie Chouinard. Carter is also the founder of the Twisted Outreach Project for back care for scoliosis patients, focusing on a yoga and somatic practice.
[33] Reference video on the bridge topic of weight: https://youtu.be/9wjOTzUhz7w

the fluency and clarity in speaking. Hackney describes this as, “In dance or athletics we `speak´ with the language of movement- performing skills which require sophisticated coordination of patterns. We need an ability to move facilely between simple and complex patterns of body organization” (Hackney, 2002, S. 27). When we discuss succession, we are describing the sequential order or pattern that the articulation follows. Together, succession and articulation describe sequential kinetic chains of movement. When multiple kinetic chains are connected it forms movement phrases, comparable to sentences in spoken language, constructed with rhythm, intonation and punctuated by the initiation, accents and trajectory of the movements. A virtuosic dancer is one with highly developed succession and articulation, transmitting a well-defined kinetic language to the viewer. In both contemporary and ballet technique it is an essential attribute to the development within the technique but also the artistry and expression of the movement. It opens the dancer’s range of qualities, tones, and specificity of movement, allowing their intention to come across clearer. In Bartenieff’s principles the development of greater succession and articulation are strongly described through total body connectivity, stability and mobility, intent and complexity.

In training both in contemporary and ballet, there is often a great focus on controlling movement, but when adversely interpreted, this can translate to holding which creates a blockage at the joint and restricts articulated movement. When the body becomes fixed or held it often interferes with our breath pattern, creating a static sensation that manifests visually (Todd, 1937, S. 275). In working to overcome this negative patterning and develop greater articulation and succession with the dancers, I introduced basic spinal articulation exercises performed in all-four position. In these exercises the integration of Bartenieff’s head-tail pattern was essential in awakening the connectivity of the entire spine. As we alternated initiating points, the dancers tuned into the trajectory of the successive articulations. As the spine became increasingly mobile, we discussed the connectivity through the ground that stabilized or grounded the dancers as they pressed their hands and feet into the floor, taking force to wave or ripple through their spines. This enhanced their awareness to the participation of total body connectivity despite primarily focusing on the articulation of the spine. As we progressed to standing exercises at the barre and center, the dancers were invited into full embodied movements that began to involve all of Bartenieff’s movement patterns and in combination with other bridging topics. Facilitating their focus on succession and articulation, attention was given to weight and opposition, stimulating a more effective response. When we discussed the dancer’s experience in doing these exercises, one dancer noted that by giving more attention to succession and articulation, they found a greater meaning within the

movement. It was described as finding a more expressive and descriptive way of moving. In connecting this with Bartenieff's principle of intent, the connectivity of the body and mind, the mindful awareness of articulation both shaped the intention of the movement and reciprocally, the movements attitude described an intent to the mind. It was also apparent that in the dancer's exploration of succession and articulation, that we could recognize instances of all of Bartenieff's movement patterns and when they reflected on the cross lateral pattern, it was brought into connection with the use of spiral. The spiral being composed of successive articulations is the final bridge. For a concise referential video demonstrating the exercises for succession and articulation, follow the web link listed in the footnote below.[34]

8.10 Spiral

The spiral is a fascinating structure with applications in science, architecture, nature and art. In mathematics, spirals occur in various equations producing different forms such as the Fibonacci spiral or Archimedean. All forms of spirals are composed of curved lines which provide structural flexibility and stability resulting in a resilience and strength to the form. These same curved lines produce its pleasing aesthetic fostering its importance in art and design. The spiral's structure has the particularly important attribute of producing rotational motion, making it an essential tool in dance.

If we look at the applications of the spiral in a dance context, we can consider it in 3 ways. Spatial spirals can be viewed as the use of the spiral form in the trajectory of movement or formations in space and occurs primarily as a choreographic element. We can also find spirals internally within the body. Muscular structures such as the latissimus dorsi which wraps from thoracic spine to spiral under the humerus before attaching (Calais-Germain, 1991, S. 131). This spiraling structure of the muscle allows it to support rotational motion of the arm. Muscle actions also occurs in spiral chains along the length of the body and facilitate cross lateral actions such as walking and running (Spiral Stabilization, 2014). This internal spiraling action facilitates the third application, spiral of the body. This spiral is recognized for its dynamic successive movement where body parts rotate and move through space creating a spiraling form. Spiral is a common component in contemporary technique but it is essential to ballet technique as well and can be recognized in movements such as *épaulement*. Spiral in this context has two forms of action. In spiraling the body, it can function in the form of a helix or a coil but it can also function similarly to a screw.

[34] Reference video to the work done on succession and articulation: https://youtu.be/BSxSQNGzK14

The coil spiral is recognized for being bi-directional, meaning it can rotate both away and towards a fixed point, most often being the dancers center. Here Bartenieff's patterns of core-distal and cross-lateral are involved to engage this system of oppositional rotation. This coil form of spiral is seen in the action of wrapping the leg *derriere* into *attitude en l'air* or in spiraling inwards to the center as found in Graham technique. This coil form takes on many similar properties of opposition as the spiral similarly moves in counter direction. Therefore, it creates stability through expansion and potential energy in compression. The second form of spiral in the body, can be considered in the form of a screw. This spiral by comparison is uni-directional, meaning that it starts from a single point of initiation and moves in a single trajectory. This matches the function and mechanics of a common screw that receives torque at a single point, known as the drive, to produce rotational motion outward from that force. How do we compare that to motion in the body? If we use the shoulder as a drive point and exert torque to twist the length of the arm, a spiraling motion of the arm leads into space. When standing in first position and the legs are engaged in outward rotation, the sensation of spiraling into the floor occurs. The screw form of spiral is a very present element in choreography, and when the dancer understands how to specify the initiating point, the degree of torque required, and the architectural volume the spiral they should execute, then the dancer expands their understanding of their movement capacity and enhances their motor control skills.

In working with the dancers, we began again with base exercises designed to familiarize and pattern the spiral into their bodies. These were performed on the floor and with specification between the two forms of spirals in use. As these patterns took form in the dancer's bodies, we progressed to movement exploration where the dancers experimented between the two forms and confirmed the potential use of spiral as an initiator to movement, a completion element to a sequence or as a transitional element. In doing so the dancers isolated applications of the spiral such as moving in out and of the floor with ease, using the spiral as counter to momentum in a decelerating action and its application for rotation of the body in turns. The dancers were then given exercises at the barre and in the center, where the spiral was accentuated in some cases, such as in *rond de jambe*, in order to tune into the more modest spiraling action that occurs in counter action to the leg during regular execution. Connecting this with other bridging topics such as weight, aloud the dancer's experience to be amplified and the presence of the spiral enhanced. By the final exercises in the center, the dancers were no longer investigating the use of the spiral, but had integrated it as well as the other bridges in combination in full embodied expressions. I observed a greater sensitivity in the dancer's approach and heightened awareness to the subtle shifts occurring through movement. In

feedback from the dancers, they commented that the progression from base exercises through to center work provided a sensible build up, giving time for ideas to anchor into the body and mind. The work in itself they didn't define as either ballet or contemporary and we determined that it was better not to fix it into a category as its application aimed to serve both techniques and to do so, it was well suited to have an androgenous classification.

In considering the total application of the bridges, I noted a greater potential in this approach to that of earlier attempts. The bridges themselves provide the dancers with specific tools to build connections and by combining it with underlining support from Bartenieff's work, the substance of the approach holds a significant impact. However, at these early stages of development, it continues to be a question of its feasible application within a professional company setting and I would anticipate that the structure and application will require further amendments. What it certainly requires is a long enough duration of introduction that both dancers and trainer become well versed in the use and understanding of the bridges and in doing so, greater potential will likely present itself through the act of doing, repetition and practice. Like any application, it requires an immense devotion to build a relationship to the material that allows it to be wielded to its fullest.

9. Reflections and Conclusion

In the previous chapters the various applications and strategies of this thesis topic have been discussed in their theoretical state and practical application. The results of this research will now be discussed as a review of the current state of development and further questions and possible areas for future development will be offered.

Starting with the topic of fitness and conditioning integration in dance training, one of the challenges facing this application is created by the situation of group training which doesn't easily allow for personalized training stimulus. Each dancer's fitness level and training needs differ slightly. Offering modifications to either increase or decrease the training stimulus may help to combat this. Despite this, the volume and frequency of the applications could be argued to be insufficient for some individuals and they may regardless require supplementary training to achieve personal training aims. The positive result of the application is the dance specific conditions of the fitness training that aligned with the principles of training specificity making it arguably beneficial to include within a dance setting. Eric Franklin advocates that simply executing strength training exercises for example, doesn't guarantee positive results in one's dancing unless it is integrated into efficient movement patterns mimicking movement pathways specific to dance (Franklin E. , 2004, S. 17). This idea also motivated the research into aerobic dance training. This research however requires further trials conducted over duration in a professional company setting to offer conclusive results. While the trials with bachelor students offered positive results in achieving aerobic training conditions, questions remain to the efficiency of application and the feasibility within the scheduling and planning of a dance company. Suggestions from researcher Liane Simmel include a 4 week duration of dance specific aerobic training, offered as blocks occurring two to three times per season as well as replacing regular training with aerobic training up to three times a week (Simmel, Dance Medicine in Practice, 2014, S. 223). Again, this volume of integration could pose a challenge in terms of scheduling and acceptance from the management and dancers unless the value of this training is understood and prioritized. Further research is needed to verify the positive impact for dance companies before wide spread application will likely become integrated.

In order to integrate fitness and conditioning training impactfully I believe it would benefit from the following suggestions based on the practical work conducted for this thesis. The training duration hinders integration when the flexibility to lengthen or shorten training is restricted. Certain applications require a longer training session to ensure a valuable integration

while maintaining balance within the total structure and content. Companies would also benefit from developing a partnership with a well-educated and practiced physical trainer who can make recommendations on effective training plans and in exercise development to support the ballet master through their fitness specific expertise. Also developing relationships with health care specialists in fields of physiotherapy, massage therapy, and osteopathy can help in preventative care and injury management. The leading example is the Royal Ballet in London, who employs a team of 17 specialists for these purposes (Bailey, 2018). For smaller companies and smaller budgets, establishing a trusted partnership is a worthwhile investment and is the start to better supported health and well-being of the entire team.

Looking at the next topic of training principles, the results of the applications do not produce conclusive results. This is in part due to the fact that the implementation of proper periodization and tapering is not possible under the current structuring of the working season of dance companies. This remains a limiting factor in the effectiveness of implementing training principles within a theater system that doesn't prioritize the well-being and performance development of its artists. Despite this, positive impact was created by overview planning that highlighted the appropriate times for progressive overload training or when tapering or recovery were needed. As well, the positive response received from the dancer feedback on variable training intensities, supports the continued pursuit of this strategy. The question I pose now is, how can season planning be re-designed to allow the possibility for improved balance in the working schedule? Rather than planning that prioritizes financial aims and technical logistics, theaters would need to consider a greater variety of factors and question choices on performances in the first weeks of the season or double performance days, for example. These following areas of planning should be considered in order to improve the working condition of the dancers; distribution of performances and schedule, incorporated time off, and end rehearsals leading up to the premier of a production.

The final topic under review started in 2020 under the theorized and applied application of harmonizing techniques but under further development was re-designed as bridges: building connections between technical practices. The original application design placed a large focus on the categorization of training types and training levels. In doing so, the design unintentionally re-iterated the practice of defining and compartmentalizing technique through classification. The possibility to erase borders between technical forms was therefore hindered and it resulted in a difficult to navigate and non-user friendly format. The re-designed application shifted focuses from defining the training given in classes to applications and strategies to address the technique and movement. The bridges act as tools for connecting

knowledge and the technical practice of ballet and contemporary. Having been developed and applied to a small group working in an isolated situation, the greater application in the context of a full time dance company still requires further research and a possible re-construction to the application may be again necessary. The wide spread acceptance of such training is again unknown but would certainly require an adjustment in training culture and an open and willingness of dancers and the company direction to support a new application. Part of the challenge also lays in the psychological conditioning of many dancers who share this sentiment explained by Mario Alberto Zambrano, associate dance director of the Julliard school in New York, "Maybe there is a fear that the ball will drop if we don't take ballet every day, that the rigor will fade." (Wittenburg, 2020). This belief stands in the way of progress for this application and other alternative training methods. Change is starting to occur as more and more education systems are starting to incorporate greater balance and value in contemporary and ballet training as is the example with the dance programs at P.A.R.T.S in Brussels or *Zürcher Hochschule der Künste*.[35] The climate of the dance culture in each company will vary and also represents new conditions and challenges. As such, any application should be implemented with sensitivity and over a great enough period of time to allow for adjustments to occur gradually. Authors Melanie Bales and Rebecca Nettl-Fiol explain that any changes can be met with frustration, shock, or mis-trust as one experiences a potential temporary step back in particular when, "long established ideas are being challenged" (Bales & Nettl-Fiol, 2008, S. 116). However, if one has enough time to adjust to changing factors, meaning new information is slowly introduced, then the experience becomes increasingly acceptable (Ölme, 2014, S. 58), which would be advisable when strategizing the use of this application with any new group of dancers.

The work on the 5 bridges with three professional dancers in Aix-en-Provence, France, provided interesting feedback and suggested that the new development had moved the application into a more user friendly and graspable form. The 5 bridges now serve as tools for the trainer and dancers to incorporate throughout dance classes and highlight various movement principles within technical practice. The application has become increasingly supported by the foundation work of Irmgard Bartenieff and allows the deconstruction of complex movement into base essentials aimed at deriving deeper understanding and

[35] The programs at both P.A.R.T.S in Brussels and ZHdK in Zurich offer contemporary and ballet training in a model that develops diversly trained dancers for an ever changing dance cultural and choreographic scene. The following are web links to program outlines for each school. P.A.R.T.S.: https://www.parts.be/dance-technique ZHdK: https://www.zhdk.ch/departemente/ddk/tanz-552

connections in movement. Additionally, the application has a build-up format moving from foundation exercises to full integration in center work that slows the integration process into a methodical approach to combat kinesthetic confusion. There is however, an overarching limitation to this application that much of it is subjective and has limited research based publications. When discussing qualitative performance outcomes in individual dancers the expression of the art form and ingenuity of modern choreography create predominantly opinion based argumentation on what is a better result and why.

The remaining question is what is the future for this research and these topics? As choreography and programming continues to evolve this topic will continue to increase in its relevance. When changes in class and training are not implemented, the gap between choreographic demands and class work will only increase. But in order to establish a feasible and wide spread acceptable application, more research and practical work with dance companies must occur. The applications and strategies as they have been presented in this thesis are aimed at an improved correlation between training and choreography while supporting dancer well-being but these well intended aims are at the moment possible only in a utopian construct. Meaning that I believe that a feasible application requires a greater re-structuring of the theater system in order for changes to have the space and support to be carried out. Starting this research topic, I viewed the problems from the perspective as a dancer but cumulating this research I have gained the insight of the reality of the working conditions from the point of view of the ballet mistress and rehearsal director. The issues with the class remain for the dancers primarily the same but limiting factors as I have experienced in budgeting, personnel, unprotected working conditions of the rehearsal director, planning of the entire theater's season, and comprehension of working requirements of the dance company from the part of the theater management are all acting as blockades that need to be addressed. Based on my experience working in three state funded theatres, I offer suggestions on a few steps of action that can be taken.[36] They include, joining the union representing the artists of the theater and becoming involved with the works council. A works council that does not understand the working conditions of the dance company or their needs will not effectively represent and protect them.[37] Dance directors and artistic staff need to stand up for the position of the dance company within the theater and demand equal respect and consideration as the other

[36] My employment as a ballet mistress and rehearsal director has been with; Oper Graz, Theater St. Gallen and Tiroler Landestheater.

[37] Based on a personal experience at the Tiroler Landestheater where the *Betriebsrat* members did not understand the difference between dancer's training and rehearsals or the physical demands of the work as a dancer.

departments receive in budgeting and scheduling. Theater directors and dance directors could also look to other models of dance companies on how they manage and offer progressive and impactful structural solutions that prioritize dancer well-being. And a great benefit could be gained from establishing partnerships with organizations that have a mandate to research and educate on dance science such as the International Association of Dance Medicine and Science and ta.med.[38] Additionally, research collaborations should be pursued with universities as advised in the Safe Dance Report IV (Vassallo, 2017, S. 22-23). These partnerships can foster the capability for further research and pilot projects to be carried out, offering benefits for dance companies to be supported in progressive work in the area of dance science.

While the findings of this research do not offer conclusive results, the thesis presents valuable argumentation for further research to be conducted. With further development these applications and strategies have the potential to achieve a greater correlation between the daily training in class work and the choreographic demands in mixed repertoire dance companies.

[38] Ta.med is a German and Austrian dance medicine organization promoting health in all forms of dance. Weblink to the EU ta.med website: https://www.tamed.eu

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Appendix

A list of the companies reviewed for the consideration of mixed repertoire programming

Following are links to dance company websites and seasonal programming

NYC ballet: https://www.nycballet.com/season-and-tickets

Ballet British Columbia: https://balletbc.com

NDT: https://www.ndt.nl/en/

Les Grands Ballets Canadiens: https://grandsballets.com/en/

Royal Flanders Ballet: https://operaballet.be/en

National Theater Mannheim: https://www.nationaltheater-mannheim.de

Theater Regensburg: https://www.theater-regensburg.de/spielplan/monatsspielplan/

Carte Blanche: https://carteblanche.no/en/

Kidd Pivot: https://kiddpivot.org

Ballet du Rhin: https://www.operanationaldurhin.eu/en/spectacles/saison-2020-2021/dance

Opera de Lyon: https://www.opera-lyon.com/fr/programmation/danse

Staatstheater Mainz: https://www.staatstheater-mainz.com/web/ (Wittenburg, 2020)

Theater Nürnberg: https://www.staatstheater-nuernberg.de/home

Tanztheater Münster: https://www.theater-muenster.com/programm/tanztheater-2020-21.html

West Australian Ballet Theater: https://waballet.com.au

Landestheater Linz: https://www.landestheater-linz.at/stuecke#Tanz

Ballet Croatian National Theater: https://www.hnk-split.hr/en/ballet

Národní Divadlo Brno: http://www.ndbrno.cz/ballet

Jihoceske Divadlo Balet: https://www.jihoceskedivadlo.cz/balet

Zagreb Dance Company: http://www.zagrebackiplesniansambl.hr/en/

Ballet Compagnie Oldenburg: https://www.facebook.com/BallettCompagnie/

Ballett am Rhein: https://operamrhein.de/en_EN/ballettabende?se=current

Mainfranken Theater / Ballett Wurzburg: https://www.mainfrankentheater.de

Theater Bremen: https://www.theaterbremen.de/de_DE/programm#premieren-tanz