

Choristers' Perceptions of Laban-based Conducting Gestures

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Abstract

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This study evaluated the perceptual accuracy of choristers with no conducting training when identifying Laban Movement Analysis-based gestural qualities. The larger research imperative addressed identifying the qualities most salient to choristers. The participants rated *Effort Elements* in 96 conducting gestures covering 8 different configurations of Laban's *Action Drive - Dab, Flick, Slash, Punch, Press, Wring, Glide, and Float*, and I compared their scores with a group of Laban-trained conducting participants for analysis. Each configuration of *Action Drive* contains one *Element* of each conducting movement *Factor: Time, Weight, and Space*. *Time* is the perceptible speed of a gesture, unconnected to musical tempo, and it exists on a continuum between *Quick* and *Sustained Effort Elements*; *Weight* is the strength or force of a gesture, and it exists on a continuum between *Light* and *Strong Effort Elements*; *Space* is the honed or diffuse focus of a gesture, and it exists on a continuum between *Direct* and *Indirect Effort Elements*.

The null hypotheses stated that 1) there would be no difference among ratings of the Laban *Effort Factors* of *Time*, *Weight*, or *Space* between these choristers (Novice, $n = 21$) and Laban-trained conductors (Laban, $n = 24$), and 2) that all participants would rate gestures more accurately than chance. Chi-square tests of independence revealed a significant difference based upon group membership for the *Time* ($[\chi^2 (1, n = 1408) = 51.19, p < .017]$) and *Space* ($[\chi^2 (1, n = 1440) = 13.18, p < .017]$) *Factors*, with no difference for the *Weight Factor*. Results also indicated that both *Time* and *Weight* were identified with reasonable accuracy by Novice (83% and 92%, respectively) and Laban groups (85% and 89%, respectively); *Space* was not accurately identified by either group (Novice, 50%; Laban, 59%).

Results showed that while Laban-based conducting training improved Laban-based observation accuracy, participants without training correctly identified some components of expressive gesture. These findings could function as a basis for streamlining gestures in rehearsal when choristers are responding inconsistently, or to guide musical changes during a performance. The study left unanswered the role of the *Space Factor*, since the inconsistent perception across both participant groups implied that it is too complicated, multi-faceted, or personal, for consistent perception in silent video examples. Additionally, the results offered a framework for continued Laban-based conducting research.

TABLE OF CONTENTS

List of Figures	iii
List of Tables	iv
Chapter 1. Introduction	1
1.1 Laban Theoretical Overview.....	2
1.2 Laban Historical Overview	7
Chapter 2. Literature Review	15
2.1 Conducting Gesture Perception and Instruction	15
2.2 Spatio-Temporal Gesture	17
2.3 Expressive Gesture.....	19
2.4 Audio-Video Interplay	21
2.5 Emotional Communication Through Music	25
2.6 Laban Movement Literature	29
Chapter 3. Methodology	41
3.1 Statement of the Problem.....	41
3.2 Creating Video Stimuli	42
3.2.1 Participants.....	42
3.2.2 Expert Judges	43
3.2.3 Final Video Stimuli.....	44
3.3 Creating Response Materials	45
3.3.1 Determining Semantic Differential Scale Scores	45
3.3.2 Creating Participant Response Instrument.....	46
3.4 Participants.....	47
3.5 Procedure	50
3.6 Analysis.....	53
Chapter 4. Results	55

4.1	Effort Factor Identification	55
4.1.1	Strength of Identification	57
4.2	Differences by Conductor	59
4.3	Isolating Effort Elements	60
4.4	Configurations of Action Drive	62
4.5	Summary	65
Chapter 5. Discussion		67
5.1	Contextualizing Results	67
5.1.1	Research Questions	67
5.1.2	Isolating Effort Elements	69
5.1.3	Configurations of Action Drive	72
5.2	Limitations and Confounds	75
5.2.1	Space Factor: Crucial Finding or Limitation?	75
5.2.2	Stimuli Conductors	78
5.2.3	Response Type	81
5.3	Paradigm for Maximizing Clear Communication	82
5.4	Conclusions and Future Research	86
References		90
Appendix A: Human Subjects Division Approval		97
Appendix B: Participant Response Forms		98
Appendix C: Raw Data		108

LIST OF FIGURES

Figure 1.1 Kinesphere/“Vitruvian Man vector silhouette”	5
Figure 1.2 Planes of movement (Longstaff, Treu, & Royston, 2007)	6
Figure 3.1 Semantic differential scale example for Time Effort Element	46
Figure 3.2 Gender identity of participants	48
Figure 3.3 Age category of participants.....	48
Figure 3.4 Highest educational attainment of participants	49
Figure 4.1 Effort Factor accuracy scores	56
Figure 4.2 Time Effort Factor: responses for semantic differential scores 1-6	58
Figure 4.3 Weight Effort Factor: responses for semantic differential scores 1-6.....	58
Figure 4.4 Space Effort Factor: responses for semantic differential scores 1-6	59
Figure 4.5 Accuracy by conductor.....	60
Figure 4.6 Effort Element accuracy scores	61
Figure 4.7 Action Drive configuration accuracy scores	63
Figure 5.1 Laban Effort cubic representation	73
Figure 5.2 Condensing Elements cubic representation.....	74
Figure 5.3 Expanding Elements cubic representation.....	75
Figure 5.4 Accuracy for Time and Weight Effort Factors.....	83
Figure 5.5 Accuracy for Rhythm State configurations	85

LIST OF TABLES

Table 3.1 Laban's Action Drive configurations	43
Table 3.2 Laban's Effort Factors with semantic differential scores	45
Table 3.3 Laban's Action Drive configurations with semantic differential scores	46
Table 3.4 Movement experiences by participant group.....	50
Table 4.1 Frequency of correct/incorrect responses by Effort Factor	55
Table 4.2 Chi-square test results by Effort Element.....	62
Table 4.3 Chi-square test results by Action Drive configuration	64
Table 5.1 Video examples used in Rhythm State analysis	84
Table 5.2 Chi-square test results by Rhythm State configuration	85

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DEDICATION

To Aramis, and with deep appreciation for Andrew

Chapter 1. INTRODUCTION

The vivid image of conductors as the focal point of orchestras, bands, or choirs makes these musicians rich subjects for observation and study. Compared to other classical music professions, the field of conducting is in its youth, and as the specific expectations and responsibilities of conductors change through practice and research, it is certainly still a developing field. With conducting gesture, there are several variables of execution and interpretation of gesture that are folded into the trinity of the conductor, the performers, and the audience. The conductor, each performer, and each member of the audience is part of the unique dialogue of live musical experience, where the emotional and musical content must be filtered through each participant. Tied to the musical and emotional content is the technique and expressive palette drawn upon for the performance. For the conductor, this includes the construction of the gesture and the generalized musical picture, crafted through rehearsal and presented in performance. For the ensemble members, their interpretation of the conductor's gesture plays into their musical execution. For the audience, their perceptions of the musical experience, based upon their understanding of the sights and sounds presented by the conductor and the ensemble, create the foundation for their experiences. The interconnectedness of these three groups and the information that influences a performance experience makes the study of conducting complex. Since conductors attempt to sculpt the sonic information during rehearsals, while both initiating and reflecting the music within a performance, the continued study of this craft is essential to gaining a complete understanding of musical performances.

This research study focused on the study of the conductor as an effective visual communicator. The rehearsal process and verbal communication components are also crucial to

the success of conductors and their ensembles, but the scope of this investigation was limited to visual information presented by conductors to ensemble members. It was my hope that focusing exclusively on the presentation of visual information led to a more detailed understanding of this component. To ensure a framework broad enough to be inclusive of movement research outside of traditional conducting studies, I incorporated both theoretical and empirical foundation materials related to the visual interpretation of expressive movement. The empirical framework included literature discussing movement, the connection of audio and visual perception, and the interpretation of artistic expression. The theoretical framework included information about Laban Movement Analysis, the use of Laban language in movement research, and hypothesized some connections to conducting instructional pedagogy. Investigating the inherent usefulness of the Laban framework and vocabulary outside of trained Laban practitioners is important for assessing its usefulness for lay people not only in conducting, but also in other movement fields. As with many emergent areas of research, the intersection of these varied disciplines may be more informative than any individual area. By addressing the intersectionality of these areas, I intended to include manageable perception evaluation tasks that supported continued research at these crossroads. By offering connections to bodies of research outside of conducting gesture, I intended to highlight the similarities among movement and perception disciplines to reinforce conducting as artistic, communicative movement.

1.1 LABAN THEORETICAL OVERVIEW

Laban Movement Analysis (LMA) is a system for describing the diversity of functional and expressive human movement. This system contains four descriptive categories: *Body*, *Effort*, *Shape*, and *Space*. Though these categories are described separately below, multiple categories

can be simultaneously present when observing and describing human movement. For the purposes of focused analysis, this research study limits its movement descriptions exclusively to qualities in the *Effort* category. To gain a greater understanding of how Laban's system uses the four categories, definitions are included below.

Body includes descriptions of which body parts are involved in each movement and how those parts are physically connecting or messaging through the whole of the body. An example of this would be when the mover is reaching out with her right arm while pressing her left foot into the ground for stability. Parts of the body can be used at the same time, moving through adjacent parts, or sequencing any body parts together. There are basic organizing patterns within the body that help people consciously experience relationships of connection. Some examples of these patterns include upper/lower, right-side/left-side, and cross-lateral relationship.

Effort is the category of Laban's system that describes how people are investing their energy. This energy investment begins with the intent to initiate movement, continues through the gesture or movement itself, and concludes with the cessation of a gesture, movement, or movement phrase. Like perception of speech patterns or music, individual movements are often perceived in phrases. Within the *Effort* category, there are four types of *Effort Factors: Time, Weight, Space, and Flow*. *Time* is a description of how urgent (*Quick Time*) or leisurely (*Sustained Time*) a person perceives an action to be. Though musical tempos can complicate understanding it, *Time* is not simply a fast or slow tempo. Rather, it is an attitude about how much time one has for a given gesture, movement, or task. *Weight* is the investment of a person's mass, or the force (*Strong Weight*) or gentleness (*Light Weight*) with which one moves. *Weight* can also be applied actively, as described above, or passively by being *Heavy* or *Limp* with the use of one's limbs or whole body. *Passive Weight* is rare in conducting instruction, since

activating one's body in a specific way to accomplish a goal has long been the norm. *Space* is how a person invests focus within the environment and/or how they focus and interact with other people sharing the surrounding area. Attention can be focused on one thing specifically (*Direct Space*), or invested in a more general scanning of the area (*Indirect Space*). *Flow* describes the fluidity of movement. People can use *Bound Flow* and restrict or contain their movements, or *Free Flow* when committing to uninhibited motion. *Effort Factors* each include a pair of *Effort Elements* (i.e. *Bound* and *Free Flow*) that represent opposites within a continuum. These *Effort Elements* are combinable into groups of two, three, or four *Elements*, creating *States*, *Drives*, and *Full Effort Actions*. When observing *Effort*, a movement that is at the extreme of the continuum may be easier for people to label than movements that fall more toward the middle of an *Effort* continuum, though human movement exists across the entirety of that continuum.

Shape includes descriptions of the various forms that the human body can create. The body creates form by changing its position (i.e. *Ball*, *Pin*, *Wall*, etc.), and by emerging or withdrawing as people move into, away from, and interact with their environment (i.e. *Rising/Sinking*, *Spreading/Enclosing*, *Advancing/Retreating*). The *Shape* category can be invoked by using different modes to interact with one's self and the environment. The *Shape* category includes attending solely to one's self through the small movements (i.e. *Shape Flow*), moving directly into the environment using *Directional Modes of Shape Change* (i.e. *Spoking* and *Arcing*), or using three-dimensional movement (i.e. *Carving*) that both changes and is being changed by the environment. This category also includes the sculpting of the torso from within through breath to support movements of the limbs (i.e. *Shape Flow Support*).

Space defines a person's interactions with the environment; it is the description of the invisible tracings, or pathways, left in the air around someone as they move. Though *Space*

requires the use of the *Body* and can include various components of the *Shape* and *Effort* categories, it is the movement through the space or area around the person is noteworthy. The *Kinesphere* is a description of the three-dimensional sphere around the body where one can easily reach. This term can be used to describe whether a person is working within a large personal space (*Far-Reach Kinesphere*) or a small one (*Near-Reach Kinesphere*), or if gestures and movements tend to be concentrated in one region (i.e. *Front, Back, Side, High, Low*, etc.) around the body. A common depiction of the *Kinesphere* is Leonardo DaVinci's classic *Vitruvian Man* (Figure 1.1).

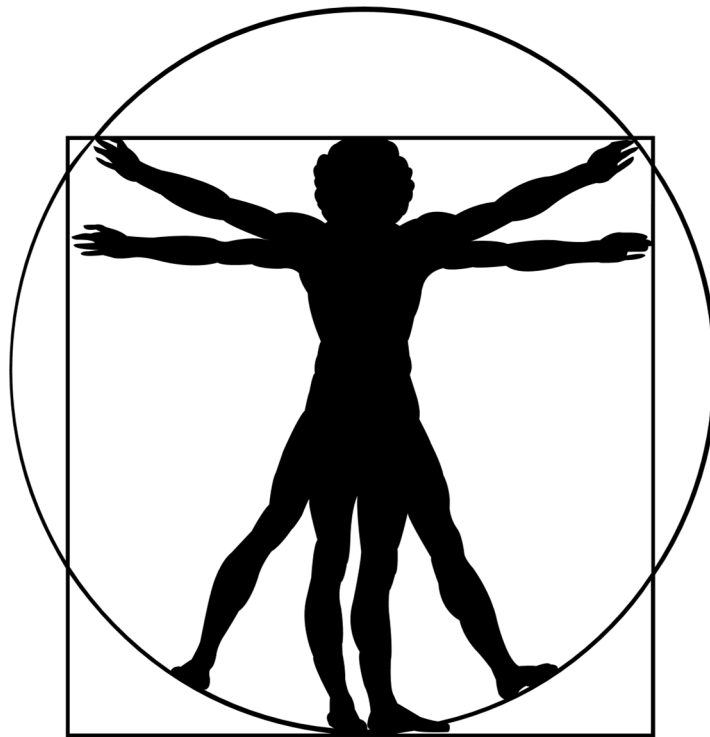


Figure 1.1 *Kinesphere*/"*Vitruvian Man* vector silhouette"
Courtesy of Natasha Sinagina (2015), licensed by Creative Commons,
<https://creativecommons.org/licenses/by/4.0/>

The *Space* category also includes the framework to describe the three planes of movement: *Vertical, Sagittal, and Horizontal Planes*. *Vertical* and *Horizontal Planes* are integrated into

conducting gesture by the simple execution of beat patterns. The *Sagittal Plane* can add an important dimension of expressivity to conducting (See Figure 1.2).

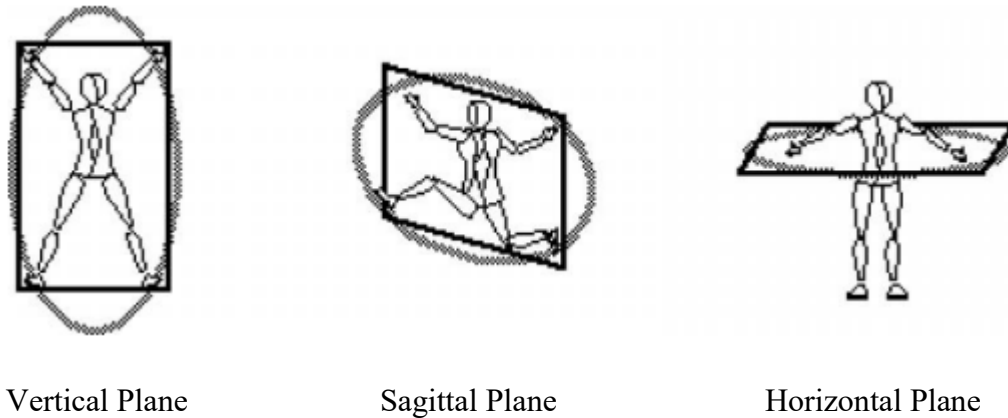


Figure 1.2 Planes of movement (Longstaff, Treu, & Royston, 2007)

Each of Laban's four categories are always present in human movement, though to varying degrees at any time. It is the combinations of categories and the integration of information from across these categories that creates rich and meaningful information about movement. For this study, I addressed only the *Effort* category to identify the degree of viewing consistency when observed by people with no Laban-based movement or conducting experience, and compared with Laban-trained conductors. It is important to note that all people have some degree of movement expertise, but the specific content area may vary with the types of movement activities they have spent time studying and moving. Additionally, all people move using *Effort* qualities, but those movements may not be tied to Laban vocabulary. My focus on *Effort* removed confounding information from Laban's other three movement categories. The decision to focus on *Effort* deliberately traded some of the richness afforded by the complete system for the possibility of consistent descriptions across many viewers. When presented with the opportunity to describe movement using the whole system, even Certified Laban/Bartenieff Movement Analysts and Certified Movement Analysts, who are trained to use and teach Laban

Movement Analysis, come to different conclusions about what categories are the most relevant in each movement observation (Broughton & Stevens, 2012; Gambetta, 2005) In the future, it would be interesting to explore conducting gesture observations using other categories, or to offer observation opportunities across categories for greater richness of conducting gesture observation.

1.2 LABAN HISTORICAL OVERVIEW

The complexity, science, and artistry of Laban Movement Analysis is rooted in the personal, occupational, and cultural experiences of Rudolf von Laban. To offer a clearer picture about the system, this section includes a brief overview of Laban as those experiences related to the development of LMA and the creation of universally applicable dance notation, now known as Labanotation. Subsequently, I describe varied regional popularization of Laban's system by his junior colleagues, and the continued expansive application of LMA by the many pupils who are working in myriad scientific and artistic fields today.

Rudolf von Laban Jr. was born on December 15, 1879 into a military family of high rank within the Austro-Hungarian army. Because his father was away for extended periods with his military duties, Laban was raised primarily by his maternal grandparents. He enjoyed spending time with his mother whenever she could join him, and during Laban's time with her he learned to swim, horseback ride, and play tennis. As a child, Laban kept himself busy by singing, dancing, drawing, and interacting imaginatively with the natural environment (Preston-Dunlop, 2008).

The imagination and curiosity of Laban's childhood served to guide experiences throughout his life. He was introduced to Sufism as an adolescent, an experience that laid the groundwork for later study of mysticism and movement. Laban's exposure to the power of

movement over people left a lasting impression, and he “drank in Middle-Eastern philosophy and sacred practices” (Preston-Dunlop, 2008, p. 3). In his early teens, Laban spent time at the city theater, assisting whenever possible backstage and absorbing the creative atmosphere. His interest in theater continued as a young adult, when he regularly attended Viennese theater and opera productions. His exposure to first-class instrumental and operatic music added to his varied experiences with visual and performing arts (Preston-Dunlop, 2008).

In 1899, he began studying at the Military Academy of Wiener Neustadt, likely at the insistence of his father. Though he seemed by 1900 to be making good progress, his German was still weak, and the overall structure of the education did not suit Laban well. He subsequently left the academy, and when reflecting on this decision, Laban indicated that he was frightened of machines dominating men (Preston-Dunlop, 2008). He was likely commenting on the automation of production, and the machine-like treatment of workers and students. Laban was not one to be treated like a cog, so he moved on to continue his own informal education as a painter.

Through his own work as a visual artist, Laban was acquainted with the abstract painter, Wassily Kandinsky, and the post-tonal composer, Arnold Schoenberg. Compositionally, Laban was interested in their commitment to overcoming the formal restrictions of their art forms within their original works. Kandinsky had addressed the role of a painter in a time of the photograph; he believed that representation was no longer the goal for modern painting, but rather the goal was finding the expressive powers of the medium itself (Preston-Dunlop, 2008). Similarly, Laban did not want the art of dance to be subservient to the art of music. Laban also crossed paths with Émile Jaques-Dalcroze, though when asked about the similarity between LMA and Dalcroze Eurhythmics, he always claimed that Dalcroze was not at all influential upon

his work (Preston-Dunlop, 2008). Unlike Dalcroze, Laban's system of movement analysis set to describe movement within its own right, rather than dance being referential to music, prescribed emotional content, or a specific narrative. Though Laban would not codify these ideas for decades, Kandinsky's treatises and abstract art certainly influenced him (Preston-Dunlop, 2008).

By 1912, Laban was no longer describing himself as a painter, but had “centered his attention on movement and dance as the prime focus of his energies” (Preston-Dunlop, 2008, p. 23). This was also the period where Laban began exploring movement without melody, using only a tambour to accompany his movement workshops (Preston-Dunlop, 2008). In 1913, he retreated to a quaint estate, Monte Verita, to work on his new style of movement with a small group of dedicated dancers until the outbreak of the First World War rendered this impossible (Preston-Dunlop, 2008). In March of 1915 Laban fully relocated to Switzerland, where he stayed until shortly after the war ended. While in Zurich, Laban familiarized himself with the work of Carl Jung, a pupil of Sigmund Freud. Laban proposed that each of these four Jungian functions of the psyche—intuition, sensing, thinking, and feeling—had a direct connection with his four motion factors of *Time*, *Weight*, *Space*, and *Flow*, respectively (Preston-Dunlop, 2008).

In 1919, Laban left Switzerland for Nuremburg, Germany. Once settled there, he began to focus on the development of a dance notation not bound to any style. Laban looked to many sources for inspiration when building his own foundational materials, studying the dance notations of Zorn, Stain-Leon, and Fauillet, the dance theories of Blasis and Noverre, and the language and sign work of Faulmann and Kleinpaul (Preston-Dunlop, 2008). His notation research is another example of Laban drawing upon the knowledge within many fields to gain a deeper understanding for a new framework.

Laban believed that everyone was a potential dancer, not in the sense that anyone could perform complicated steps, but that people could get in touch with their inner selves through the experience of moving. He suggested practicing movement experiences as communal cultural activities, since he believed this created a better sense of community and strengthened the sense of self and person for the individual (Preston-Dunlop, 2008). Unlike choreography, movement choirs are only loosely structured in advance of the experience by the members of the group. Because movers create the experience, no individual movement is limiting to anyone. The structure has more to do with a series of ideas, emotional content, or use of the space in the room than prescribing dance steps. Movement choirs enrich the mover, not necessarily an audience as with typical choreography.

In 1926, Laban sailed to the United States of America to observe the varied movement cultures there, including the dances of Chinese Americans, Black Americans, and American Indians, as well as American show dances and the American modern dance movement (Groff, 1990). News of Laban's notation system had reached people in United States, so reporters that greeted him were eager to hear more about this new system. Despite the warm welcome, Laban did not have any desire to stay; he believed that within American culture in general, the influence of the machine was too strong (Groff, 1990). He sailed back to Germany.

Finally, in 1927, after 14 years of trying to conceptualize his work, and 14 more years working through it, Laban finished putting together his gestural vocabulary. The crystallization occurred once the “flow and timing of movement were clearly stated in the system” (Preston-Dunlop, 2008, p. 132). His notation expressed dance steps as motion, and gestures as specific moments along the movement path. Laban continued to work in Germany using his new system of dance, and publicizing Labanotation.

With the rise of Nazism, Laban's position as an artist in Germany became increasingly precarious. While Laban was not specifically a problem for the Nazi government, he was closely watched due to the nature of his art and his relationships with Jewish artists. In 1936, he received a six-month provisional contract with vague legal status for his employment to work on the opening ceremonies for the 1936 Olympic Games. His highly coordinated opening ceremonies featuring a record number of performers never debuted, since he was swiftly relieved of his responsibilities by the Reich Minister of Propaganda, Joseph Goebbels, after Goebbels viewed the dress rehearsal. Though a lack of proper and clear ideology was the reason given for his removal, some speculate that Laban's ability to coordinate large performing forces appeared a potential threat to Nazi power (Preston-Dunlop, 2008). Regardless of the reasoning, the choreography did not adhere to the expectations of the Nazi regime. No longer able to work in Germany and increasingly fearful for his life, Laban left permanently in 1937 and sought temporary shelter in Paris (Preston-Dunlop, 2008).

By February 1938 he formally entered Britain, due to a gracious invitation by a former colleague and friend, Kurt Jooss (Preston-Dunlop, 2008). Laban lived safely with Jooss, but struggled to find purpose within his new circumstances. Since British law did not allow people with alien status to work legally, Laban focused on putting his theory of *Space Harmony* into writing. The fruits of this labor, *Choreutics*, was later edited and published by Lisa Ullman (Laban, 2011a). After obtaining legal worker status, Laban began serving as a consultant for various factory owners. The goal was to maximize the efficiency of female war-time workers using different *Effort* phrases. Laban included periods of recuperation as a part of repeated motions, so workers needed fewer breaks, and could sustain a given task at the factory for longer periods. Through Laban's suggested changes, “the operator would be able to sustain work

throughout the shift so that at the end of the day output was increased and the worker would feel less like a robot and more like a whole person” (Preston-Dunlop, 2008, p. 224). By 1945, Laban incorporated his *Effort* work into several industrial companies, as well as education. His goal was to diminish both the physical and mental exertion required throughout the day, by adjusting the flow of work and learning (Preston-Dunlop, 2008). Laban also reinvested his attention in this period to the study of acting, culminating in the publication of *Mastery of Movement on the Stage*, describing the application of *Effort* to acting. More recent editions of the book (Laban, 2011b) removed the reference to the stage in the title, since these principles are applicable more generally when looking to broaden one's physical *Effort* vocabulary.

Throughout his life, Laban sought to define a complete body of knowledge and design a notation system capable of encapsulating all kinds of functional and expressive human movement. He conducted his experiments through experiential investigation, believing his quest for knowledge to be in the field rather than in a laboratory (Groff, 1990). The beauty of this approach was that he lived his research and collaborated with a vast array of artists; the limitation was that he drew sweeping conclusions based upon personal experience. No matter how vast his experience, it could not be exhaustive. However, because Laban created an open system describing the intersection of cognitive, emotional, and kinesthetic processes, his colleagues and students had ample room to develop the system and apply it to new areas that also use expressive movement (Groff, 1990). Laban was a visionary, and thrived with other like-minded people around him to hone his ideas. He relied on trusted colleagues when preparing his works for publication, while working on his nascent notation system, when teaching LMA to students of all ages, and to help him move through the theory of his *Effort* and *Space Harmony* categories (Preston-Dunlop, 2008). Laban seemed deeply invested in these personal and

professional connections, and many proved to be avid proponents of Laban's work after his death. Because Laban was more interested in a malleable framework than a rigid system or theory, it is fitting that people who studied with him and within his framework have expanded the application of LMA into other disciplines.

Irmgard Bartenieff was a modern dancer and physical therapist who worked with Laban in the 1920s in Germany and again after World War II in England. She began applying Laban's principles of movement in her work as a Chief Physical Therapist for Polio Services at Willard Park Hospital in New York from 1943-1953. Through her incorporation of Laban, this position served as her laboratory for integrating concepts of moving through space with her patients, and ultimately developing the *Body* category within the LMA system (Groff, 1990). Before her work, the *Body* category described which body parts were moving, the body part that initiated an action, and the sequence of moving body parts in each movement. Bartenieff remained true to these basic ideas, while creating language to describe exactly how kinetic energy can travel, and deliberately focusing on the use of the pelvis for safer, full-body execution of movements by her physical therapy patients (Hackney, 2002).

Particularly in America, the scope of the LMA system includes Bartenieff Fundamentals of movement with Laban's complete theoretical framework. Bartenieff faithfully used LMA to guide her life's work, believing that "Laban's multifaceted approach to the study of human behavior through body movement has a unique contribution to make to the understanding of our world." (Groff, 1990, p. 58) As a teacher and mover, "she sought to instill in her students a commitment to embrace movement in all its complexity, to appreciate the nature of movement as a process of constant change." (Groff, 1990, p. 58) This philosophy guided Bartenieff's teaching, and continues to focus the teaching of some of her students. Her students Peggy Hackney and

Janice Meaden still teach LMA in the style of Bartenieff through the Laban/Bartenieff certification program, *Integrated Movement Studies*, based out Santa Barbara, California. Faculty and graduates of this specific program have applied principles of LMA to their work in choral conducting, vocal music instruction, cello instruction, figure skating, emergency medical technicians training, yoga practice, community-based social justice initiatives, pre-K movement classes, actor training, competitive rowing, contemporary ballet technique, creating life-like computer-animated movement sequences, training massage therapists, and deepening contact improvisation experiences. While this section addressed the broad philosophical application of Laban, the use of Laban in research applications is addressed near the end of the Literature Review.

Chapter 2. Literature Review

2.1 CONDUCTING GESTURE PERCEPTION AND INSTRUCTION

Though the study of conducting has been a part of the classical western music tradition for 200 years, there is only sporadic empirical research dedicated to the information conveyed through physical gesture. In a broader musical context, gesture is definable as “an action pattern that produces music, is encoded in music, or is made in response to music” (Godøy & Leman, 2009, p. 19). Conducting fits firmly within this definition of gesture, as it inspires the production of music, though it does not directly produce it. When conducting gestures are meaningfully tied to the music of the moment, specific gestures can be amended in response to the music produced by the ensemble. For the purposes of this study, conducting gesture was any movement made by a conductor in a relationship with music and music-makers. Because conductors visually represent the music being performed, and simultaneously influence the interpretation of a performance, it is important that the gesture serve the music both through its clarity of temporal information and its alignment with performers’ artistic and technical requirements.

Research centered on conducting pedagogy historically focused on curriculum for undergraduate conducting instruction and assessment. Grading rubrics, such as Seddon’s (2010) Criterion-Referenced Rating Instrument (CRI), sought to improve conducting feedback through Likert-type ratings for multiple criteria of expression, technique, and basic body position. The instrument proved to be reliable within its target community of conducting instructors. While this study laid a foundation for the types of information needed with comprehensive conducting feedback instrument, it also highlighted the need for continued research in the area.

Use of technology in the undergraduate conducting classroom is increasingly a part of the conducting instruction literature. Digital technology, such as *Blackboard*, not only enhances assessment through visual feedback, but also allows for written reflection and scoring within one interface (Holder, 2007). In addition to incorporating technology into undergraduate conducting classrooms, educators are also experimenting with expressive and movement resources from other disciplines. Running (2009) studied the influence of physical acting exercises in the classroom to determine if members of the acting exercises treatment group performed significantly better with facial and physical expression than the control group trained with a traditional conducting curriculum. Results indicated no significant difference between the two groups. Other than Seddon's (2010) CRI, such conducting studies tend to have a small sample size, involve a short-term treatment, and are difficult to generalize to a larger population. This limitation in sample size and methodology has created a sense of fragmentation among conducting pedagogy research, with studies often functioning as exploratory research within the field.

Research relevant to conducting instruction, while focused more specifically on the ensemble than on conductors, includes research comparing the readability of various learned—or iconic—gestures (Sousa, 1988; Cofer, 1998), and then research studying the impact of similar iconic gestures on levels of perceived vocal tension in singers (Fuelberth, 2003, 2001). The combination of these studies is impactful because the former (Sousa, 1988; Cofer, 1998) indicates that when offered instruction, gesture comprehension within a population is likely; and the latter (Fuelberth, 2003, 2001) clarifies the impact of learned left-hand gestures upon singers. Fuelberth found that gestures featuring the palm facing upward, the hand making a stabbing motion, or the hand in a fist all indicated higher levels of vocal tension for singers performing

along with those left-hand gestures. Other gestures, including the palm facing down and a sideways phrase shaping gesture, showed no increase in vocal tension. Together, these studies begin to investigate the types of gestures ensemble members are likely to encounter, and the potential impact of those gestures upon singers.

This body of research addressing perceptions of learned conducting gestures (Sousa 1988; Cofer 1998) and gesture feedback tools (Holder 2007; Seddon 2010) laid the groundwork for assessing conducting gesture and communicating effectively with ensemble members. Fuelberth's (2003, 2001) studies of the impact of left-hand gestures on vocal tension stand out as addressing ensemble member perception without instruction. The connection to this body of research to my own is vital, as it combines some of the expressive qualities addressed through gesture feedback tools (Holder 2007; Seddon 2010), and also moves beyond learned gesture vocabulary (Sousa 1988; Cofer 1998) and iconic left-hand gestures (Fuelberth 2003, 2001) to study the possibility of an expressive gesture vocabulary that is inherently meaningful to ensemble members.

2.2 SPATIO-TEMPORAL GESTURE

Researchers are using computer analysis of gesture to study the meaning of specific components within the gesture, including spatio-temporal perceptions of synchronization and conducting patterns (Luck & Toiviainen, 2006; Luck & Sloboda, 2008; Luck & Sloboda, 2012). Spatio-temporal perception focuses on how people perceive chronological time when presented with a spatial gesture, such as a conducting pattern. Synchronization specifically addresses how people determine the moment of a beat, or musical attack, when presented with different types of conducting gestures.

Luck, Toiviainen, and Thompson (2010) completed empirical research linking expressive conducting with specific gesture components. In this study, participants viewed point-light representations of two conductors, while over the course of the experiment they continuously rated the videos for their perceived valence, activity, power, and overall expression. While activity, power, and expression are somewhat self-explanatory, the scale for valence asked participants to define how pleasant or unpleasant they found the conducting. Researchers correctly predicted that results would support previous findings correlating gesture amplitude with perceptions of overall expression. When the four components of gesture were analyzed for covariance, activity and power had the strongest correlation; overall expression and valence had the weakest correlation. The combination of these studies created a rich foundation for the continued research of the components of expressive conducting perception.

Luck and Toiviainen (2006) analyzed the specific features of conducting gesture that determined ensemble synchronicity. Results of this study revealed that directional change at the lowest point of a y-axis did not determine points of synchronization, as previous research had shown and common practice had presumed; it was not a specific point in space that indicated when musicians play, but rather it was a combination of specific shifts in speed and velocity along a trajectory that influenced ensemble onset. Further investigation confirmed these results, and offered more detailed insight into the components of clarity in a conducting pattern (Luck & Sloboda, 2008; Luck & Sloboda, 2012); results indicated that the smaller the radius of curvature, the clearer the beat was to the participants, and that conducting gestures generally accelerate toward the bottom of the curve, decelerate for the curve, and then accelerate again as the hand moves up away from the curve.

The primary impact of this research for my work was the discovery that the concept of an unwavering ictus—or point in space indicative of the exact moment of the beat (Green 1997)—was uncorroborated by these spatio-temporal studies. Spatio-temporal research helps to describe how viewers perceive movement in time, and is important to consider not only when developing conducting curriculum more aligned with perception research, but also when developing other conducting gesture perception research. Understanding how people perceive the timing of beat patterns expands expressive possibilities in the malleability of those conducting patterns, since conductors are not limited to a predetermined location in space for any given ictus.

2.3 EXPRESSIVE GESTURE

Some recent conducting research focused on several factors related to expressive conducting: quality assessment of gesture and music (Wöllner, 2012), continuous response of overall expressive quality based upon varied visual conditions (Wöllner & Auhagen, 2008), and research addressing the specific qualities of emotionally expressive gesture (Luck et al., 2010). Additionally, results from Wöllner (2012) indicated that conductor-participants judged the expressive content of their own gestures and musical output to be of higher quality than the expressive content of their peers; this was true even when conductor-participants were not able to identify the point-light or musical examples as their own work. To state that another way, participants rated the videos of themselves the highest, even when unable to identify those same videos as images of themselves.

As a part of Wöllner and Auhagen's (2008) research, which will be discussed more thoroughly in the next section, conductor-participants completed an Affective Communication Test. Ensemble member-participants in the same study completed a Quantity of Motion module

(QoM), with results indicating that ensemble member-participants tended to link highly expressive content with more motion, and unexpressive content with less motion. When comparing Affective Communication Test results from the conductors with the QoM results from ensemble-member participants, there was an inverse relationship between QoM ratings and Affective Communication Test ratings; a large motion generally received a lower affective rating, while a small motion received a high affective rating as measured by the scores on the Affective Communication Test. The inverse relationship here may have been influenced by the participants relying heavily on facial expression, particularly when gesture size was small. The presence of this inverse relationship highlighted the importance of facial expression in conducting, indicated that the hands are not the only visual cue and that, in some cases, the face may provide more information to an ensemble member than gestures. It also may have indicated that expressive conducting included other components not quantifiable in the QoM rating system. Results also showed that watching a conductor using a baton in the right hand and reserving the left hand for expressive gestures presented different information at various vantage points: the left-side and frontal positions afforded the most expressive information, and these two perspectives were consistent with one another, but information from the right-side perspective contained less expressive content. Additionally, participants perceived the audio-visual condition from the frontal view to be the most expressive. Although some parts of the conductor's body may be more expressive than others, results from this study supported the idea that a holistic perception of the conductor provides the best information about expressive content.

Most importantly, these studies create a connection between a general sense of expressivity and movement. The assessment of overall gesture quality (Wöllner, 2012), the change in expressive gesture when influenced by different emotions (Luck et al., 2010), and the

complicated connection between facial expression, gesture size, and expressive content (Wöllner & Auhagen, 2008) all indicate that there is something hard to measure about the expressive gesture. This body of expressive gesture research is central for understanding my own work because it provides the justification for including a holistic frame of the stimuli conductors – face, torso, and arms – to offer the most visual information to determine expressive content (Wöllner & Auhagen, 2008). Because of the many methods for describing expressive gesture, studying it from varied perspectives enriches the research.

2.4 AUDIO-VIDEO INTERPLAY

The growing body of research analyzing the independence and interaction of audio and visual information in music performance frames how important accurate visual information can be during musical performance. Because conducting is a visual art intended to evoke an aural response, its connection to conducting gesture research is strong. Researchers have studied conductors' most expressive angles (Wöllner & Auhagen, 2008), the influence of auditory information on conducting gesture ratings (Silvey, 2011), whether visual information impacts ratings of performances (Morrison, Price, Geiger, & Cornacchio, 2009; Morrison, Price, Smedley, & Meals, 2014), and if perceptions of conductor expressivity positively correlate to musical performance ratings (Selvey, 2014). This body of research collectively paints a convincing picture that the visual information presented in performance plays a strong role in how audience members may rate and describe the musical performance in general (Kumar & Morrison, 2016). With conductors leading at the front of their ensembles, the perception of their gestures matters to ensemble performers and concert-goers alike.

Wöllner and Auhagen (2008) not only demonstrated how different camera angles of a conductor influenced ratings of expressivity from various positions within the ensemble, but also how presenting information in a visual-only format or an audio-visual format influenced expressivity ratings. These camera positions were intended to replicate traditional placement within the orchestra, so that the camera to the left of the conductor would see what a typically seated violinist would see, the camera to the right would capture information as if the cellists were viewing the conductor, and the camera located at the frontal view would document the conducting gesture as seen by an oboist. This study determined that there were differences among the expressivity ratings of these three camera positions and the two presentation modalities. The most important finding was that the audio-visual condition of the frontal view was considered the most expressive. Participants received the most expressive information when given the opportunity to absorb it in two modalities, audio and visual, and when they viewed the conductor from the position providing the most holistic perspective of the conductor – the center.

One type of research focused on the influence of visual perceptions on instrumental music performance ratings. Morrison et al.'s (2009) study paired uniform audio with high- and low-expressivity conducting. Their test group included 118 university students, all but 8 of whom were music majors who had participated in conducted ensembles for up to 20 years. The audio presented in this study was consistent across all examples, although results indicated that performances were better rated when paired with high expressivity conducting than with low expressivity conducting. The large number of music majors participating in this study was notable because it suggested that even students with training and ensemble experience were swayed by visual information over auditory stimuli; years of musical training had a smaller impact on perception than the visual information accompanying music, thus revealing the

primacy of visual information for all listeners. As a follow-up to this study, Morrison et al. (2014) completed a more comprehensive design for studying the impact of visual information on performance expressivity ratings. This study included a larger pool of participants—285 undergraduates, including 77 music majors and 208 non-majors—and required more response specificity. This study included specific changes to and rankings of dynamics and articulation in the response sheet, in addition to overall expressivity scores. Results indicated that musical expressivity rankings were correlated with overall expression rankings, and those rankings were largely determined by expressivity of conductor. In both studies, the visual information of the conductor influenced the rankings of the performances, even when, as in the 2014 study, participants analyzed specific expressive aural qualities.

In Silvey's (2011) research on the influence of audio perceptions on conducting gesture ratings, an inversion of Morrison et al.'s 2009 study, he presented stimuli including a single conducting performance overlaid with either excellent- or poor-quality audio recordings of the same song. While participants noticed that there was a difference in the two videos, results indicated specifically that conductors paired with excellent audio received compliments for the performance and credit for ensemble success while conductors paired with poor audio did not receive criticism, but rather the ensemble received criticism and was held accountable by participants for the poor playing. It seems here that conducting can raise the quality of an excellent performance, but cannot lift a poor performance.

Morrison and Selvey (2014) continued this line of inquiry to include performances by choirs, and recruited study participants with greater variability in music experience. For his dissertation, Selvey (2014) cast a wider net, beginning with 658 survey takers, but only 94 met all the criteria for inclusion in the final analysis. Following the model of similar previous

research, he included conductors with low and high expressivity in his stimuli. However, he added greater variability in the audio component by adding choirs with minimal and maximal expressivity. When matching these together, participants ranked examples matched as 1) conductor low with ensemble minimal, 2) conductor low with ensemble maximal, 3) conductor high with ensemble maximal, and 4) conductor high with ensemble minimal. Results indicated that no matter the audio pairing, conductor's expressivity was the strongest predictor of performance ratings. Selvey corroborated much of the previous work that used instrumental ensembles, indicating that conductor expressivity instrumental findings are probably applicable to choirs as well. One marked difference for Selvey was that high expressivity conducting did seem to elevate the perceptions of minimally expressive audio examples. Perhaps this was a product of the difference between Selvey's "minimal expression" (2014) and Selvey's "poor audio" (2011), in that the quality of Selvey's audio was higher while not expressive. In this sense, highly expressive conducting might elevate a quality unexpressive performance, but not a poor performance.

This body of research confirms that visual information impacts aural perception (Morrison et al., 2009; Morrison et al., 2014; Morrison & Selvey, 2014). Ensemble member conducting gesture perceptions influence the musical performance experience, and identifying specific attributes of those observations is crucial for presenting cohesive gestural and musical information to ensemble members and audiences alike. While moving forward from the premise that the visual information presented in conducting gesture is important, my research addresses another way to label some of the perceptible visual qualities of conducting gesture through Laban Movement Analysis.

2.5 EMOTIONAL COMMUNICATION THROUGH MUSIC

Emotional content and expression in gesture are often discussed as parts of music and conducting study, but can be challenging to document empirically. To bolster the body of research dedicated to emotional content and expression in music, Juslin (1997, 2000) studied the relationship of music to core human emotions – happiness, sadness, anger, and fear – while Dahl and Friberg (2012) identified visual cues within instrumental performances that convey the emotional content of the music. Looking through the lens of the impact of varied emotional content upon music performance, researchers have also studied how superimposing various emotional states onto music performers changed the audience perception of those performances (Anemone & Luck, 2012), and identified what role empathy might have on the perception of expressive musical content (Wöllner, 2012). The study within this body of research that most closely relates to the perception of emotional content in conducting gesture is Camurri, Lagerlöf, and Gualtiero's (2002) research cataloguing laypeople's perceptions of the emotional content presented by professional modern dancers.

Juslin's (1997) research served as an initial investigation into the perception of the core human emotions of happiness, sadness, anger, and fear. This early research attempted to determine the non-verbal aural cues related to these emotions when guitar players performed "When the Saints Go Marching In" while focused on each of these four emotions. In his subsequent research, Juslin (2000) used a larger group of guitarists and a greater variety of melodies. To gather more information, performers first ranked specific cues when reviewing their own recorded performances, and then listeners ranked the same cues as part of their responses. Musical features such as tempo, sound level, spectrum, articulation, and articulation standard deviation were included in the analysis, though no attempt was made by the researcher

to determine any intercorrelations among categories. Juslin found that articulation was frequently used by guitarists in their assessment of their own performances, though listeners did not perceive the use of this tool as frequently as performers employed it. Conversely, listeners were relying upon tempo as an emotional indicator more often than performers specified communicating through that musical mechanism.

Dahl and Friberg (2012) studied the expressive performance of marimba players using visual cues. For this study, viewers ranked movement characteristics including amount, speed, fluency, and regularity. Researchers used Juslin's (2000) sound cues as their guide for the second part of their experiment. To determine what parts of the body were most useful for gleaning expressive content, they used various visual conditions. Results indicated that the whole-body condition was most perceptible, while the condition missing the head was least perceptible. This finding helped confirm many conductors' feeling that conducting includes much expression from the head and face. Even here in marimba performances, it seemed to be critical for providing complete expressive information. Results indicated the following emotion/gesture connections: happiness included large and fast gestures, anger included large and jerky gestures, sadness included slow and smooth gestures, and participants could not consistently identify fear.

Anemone and Luck (2012) investigated the influence of emotions upon the expressive performance of violinists in three conditions: technique focused, expressive performance focused, and during a performance following a mood inducing task. The conditions were labeled based upon the prompts they received prior to each performance, and not necessarily descriptive of a performance outcome. The prompts asked performers first to concentrate on the technical components of performance, subsequently to try to give an expressive performance, and finally to give an emotional performance. For the mood inducing task leading up to the emotional

performance, participants were told that the composer wrote the piece following the death of his son. To guide their playing, they were told: “Think about the emotional experience you’ve just written/spoken about. Try to feel the emotions of grief, of great sadness expressed by the music. Don’t think about your playing, just focus on the emotions” (Anemone & Luck, 2012, p. 180). To prime happy emotions, performers were later told that the composer did not have a son and was happily married. They were instructed to let this new information guide the emotion of their performance. Results indicated that violinists’ performances were impacted by mood inducing tasks in that they were generally slower and smoother than the other two conditions. Also, the expressive condition contained the most speed, acceleration, and jerky movement in their performances.

Wöllner’s (2012) research gathered data about empathy levels of observers, creating a possible context for variation in participant observations. Once empathy levels were assessed via Affective Communication Test, those scores were compared with their general observations to assess any correlations. Participants compared emotional interpretations of quartet musicians with their observers in audio-visual, audio-only, and visual-only conditions. Audio-visual conditions were generally more accurately perceived than the other two conditions, and observers with higher empathy scores were more accurate than participants with lower empathy scores, particularly in the visual condition.

Camurri et al.’s (2002) dance research included an analysis of full-body movement from the perspective of emotion in movement performance, citing its sparse empirical study. Per Camurri et al., “the question of what is guiding human perception of emotion has received very little attention in empirical research” (2002, p. 213). Thus, their research included an analysis of full-body movement from the perspective of emotion in dance performance. Parts of the body

were isolated to determine which were the most expressive, and movements organized into categories based upon the affiliated base emotion. The research used modern dance as the stimuli, a standard medium in movement research; historically, modern dance was developed to embody the raw expressive content of body movement. Observers not trained in dance scored the emotional content of movements. Data suggested that each dancer portrayed emotions differently, but in the end all four subjects used the same movement qualities to access each of the four fundamental emotional states. If individual dancers can perform varied gestures and achieve similar emotional outcomes, future research could determine if differences in emotional content of conducting could be described similarly, or if it has a comparably consistent impact on gesture perception. The most fruitful and potentially unexpected conclusion of this research was that identical gestures did not create identical communication, but similar movement qualities executed in whatever ways were most expressive or meaningful to the performer created continuity across movers. From the standpoint of a conductor as communicator, the flexibility to communicate using similar gesture qualities while performing personalized gestures spoke to the varied expressive and emotional possibilities among conductors.

Identifying people's core human emotions – happiness, sadness, anger, and fear – through musical gesture (Juslin 1997; 2000) and the expressive content of movement (Camurri et al., 2002; Anemone & Luck, 2012; Dahl & Friberg 2012) underpins the goals of conductors seeking to be both musical and correlated in their expressive movement. While Laban-based gesture qualities are not inherent expressions of core human emotions, they are related in that core human emotions provide the most basic and relatable expressive content for gesture. Most importantly, the movement research presented here addresses the perceptions of people without kinesthetic expertise, and demonstrates that even without training in a specific type of

movement-based performance, specific gesture qualities clustered around certain emotional (Juslin 1997; 2000) and expressive (Dahl & Friberg 2012) content.

2.6 LABAN MOVEMENT LITERATURE

This section features a detailed overview of Laban-centered conducting research. Most of the examples are dissertation research, and many of the examples offer small or limited empirical data. Through the description of this complete body of work, I created the final framework for my study – fitting within the setting of current Laban Movement Analysis research while linking my work to movement research outside of the Laban niche.

The justification for incorporating LMA into the discipline of conducting began with Bartee's theoretical combination of Laban's movement principles with Langer's philosophy of musical motion (Bartee, 1977). He believed that "[t]he musical analogy is clear: coherent movement phrases are like phrases in music; both are expressive pattern of motion" (Bartee, 1977, p. 141). The impetus for Bartee's study was the absence of expressive body movement training in conducting curriculum, which remains a theme for continued research. In his work, he expounded about the overlap between the writings of Rudolf von Laban and of philosopher Susan Langer. As stated, this dissertation argues for the connection of these two philosophies and the usefulness of incorporating Laban into conducting. More than thirty years after Bartee, Stewart (2011) defended a philosophically-driven dissertation suggesting a new conducting curriculum based on his analysis of conducting texts, belief in the primacy of score study, and the importance of body movement instruction in creating an expressive palette for conducting gestures. One interesting component of this text was the use of existing conducting curriculum texts as resources. It combined much of the information in James Jordan's *Evoking Sound* (2009)

with the layout of Frederik Prausnitz's *Score and Podium* (1983). The proposed sequencing for a new beginning conducting curriculum began with score study, moved on to Alexander Technique, continued with Laban Movement instruction, and concluded with conducting training. Again, like Bartee, Stewart used existing printed materials as justification for a new theoretical approach. Though Stewart appeared to have a thorough personal and professional understanding of the subject matter, there was not an empirical framework from which to temper his personal understanding.

Empirical studies about LMA influence upon expressive conducting have often employed a control and treatment group model, with the treatment group receiving LMA conducting instruction (Miller, 1988; Yontz, 2001; Neidlinger, 2003), or two groups with varied sequences of LMA conducting instruction (Aubin, 2010). Atypical of previous and concurrent Laban research, Billingham (2001) used Likert-type scale feedback of left-hand clarity to create a lexicon of *Action Drive* conducting gestures. Apart from Billingham and Neidlinger, results are largely incomplete and inconclusive.

Miller (1988) and Yontz (2001) compared two groups, one using expressive gestural instruction as outlined in Elizabeth Green's conducting textbook (1997) and the other Laban-based expressive gesture instruction, and found no significant difference in the expressive capabilities of either group. Miller's dissertation (1988) served as the first experimental dissertation using Laban Movement Analysis. This quantitative study used two groups of Laban-trained beginning conducting students and two groups of traditionally-trained beginning conducting students. All students were categorized by their beginning proficiency level into three tiers of learners. The researchers analyzed these tiers to see if the LMA treatment had a different effect on any of the learner tiers. They found no significant differences, but several shortcomings

were present in this early research, including: a small sample size, the confounding variable of two instructors running the experiment at two different schools, and the use of only a loosely regulated curriculum between the four instructional groups.

Yontz's (2001) research, developed as an extension of Miller's work, eliminated many of the confounding variables in Miller's study, such as multiple instructors, multiple schools, and a loosely controlled curriculum between testing groups. Yontz used the expressivity instrument developed by Miller for the research. Though Yontz also used intact undergraduate conducting classes for his study, he randomly assigned 91 students from two tertiary institutions to two treatment groups: Laban instruction and expressive gesture instruction. In this new research, participants included both choral and instrumental students, and the research found no significant difference based upon conducting specialization. Yontz found that four variables affected individual expressive gesture ability: previous musical experience, previous conducting experience, physical and movement coordination skills, and the personality of the individual. Yontz measured personality with the characteristics outlined in Cornelia Yarbrough's 1975 study "Effect of Magnitude of Conductor Behavior on Students in Selected Mixed Choruses."

In the research, Yontz lamented that he "reveals incomplete and inconclusive evidence regarding the most effective strategies to teach expressive nonverbal communication" (2001, p. 37). However, he went on to suggest that because LMA positively impacted the expressiveness of the undergraduate conducting classes, Laban-based movement had value as an instructional tool for undergraduate conducting students. Because the traditional conducting class saw similar improvement in the expressive qualities of their conducting, Laban may have equal value to traditional conducting instruction in teaching expressive nonverbal communication through

conducting. In short, according to existing limited research, LMA-based instruction was not any better than teaching using traditional conducting instruction, but it seemed to be just as effective.

Experiments involving movement-based conducting instruction continued with Aubin's (2010) dissertation. For his work, Aubin taught identical curriculum content presented in a different sequence across two groups. The curriculum featured an identical student introduction that included the first seven classes. After this introductory period, group one received Laban instruction followed by conducting patterns, while group two received conducting pattern instruction followed by Laban instruction. Following the treatment, expert conducting instructors rated participants using Seddon's Conducting Expressivity Measure (2010), found to be reliable when used by raters who are conducting instructors. Results indicated that the order of instruction had no impact on expressivity ratings for beginning undergraduate conducting students. Although in this example the choices presented were the order in which Laban was valuable, not whether Laban instruction is valuable, results showed once again that either sequence of instruction was equivalent.

Outside of tertiary institution conducting courses, Gambetta (2005) completed a quasi-experimental design using four conductors. This study videotaped conductors in pre- and post-test conditions to document any changes in conducting. Between the pre- and post-test rehearsal videotapes, conductors received a Laban-based instructional intervention. Two conducting experts and two non-conducting Certified Movement Analysts (CMA) rated each conductor's movements on a series of Likert-type scales both before and after the Laban-based instructional intervention. Following the quasi-experiment, Gambetta drew conclusions based upon the CMA comments, expert conductor comments, and a cursory review of the scored responses. Although the comments by the raters were undoubtedly invaluable, the study did not live up to the

conclusions drawn by Gambetta. The very small sample size of four participants, paired with the non-statistical analysis of that data, obscured any empirical conclusions. The opportunity to analyze the data and replicate the study with a larger treatment group would be an informative addition to the LMA conducting research narrative, without presupposing Laban-based instructional effectiveness as Gambetta has done in this case.

Neidlinger (2003) completed dissertation research analyzing the effectiveness of instruction and its impact upon cross-discipline expressive evaluations. For the experiment, she showed silent video clips of four kinds of expressive movement - conducting, dance, figure skating, and mime - to two intact undergraduate conducting classes. The purposes of this study were (a) to determine if Laban *Effort/Shape* instruction affects young conductors' ability to perceive expressiveness in movement, (b) to determine if Laban *Effort/Shape* instruction affects young conductors' comfort level with the task of evaluating expressive movement, (c) to determine if differences exist in young conductors' expressive evaluations across four artistic disciplines (conducting, dance, figure skating, and mime), and (d) to discover trends that may emerge in subjects' motivations when making evaluative decisions. The Solomon design included two control groups receiving traditional conducting instruction, and two treatment groups receiving LMA conducting instruction. There was no difference found at the pre-test or post-test for accuracy in identifying any of the types of expressive movement. None of the groups successfully identified expressive behavior outside their area of instruction. The LMA-trained conductors expressed greater ease identifying expressive gesture in conductors than the control group, and described the expressivity of the movement with greater specificity than the control group. Specifically,

subjects were better able to distinguish between levels of expression and used a broader range of expressive ratings. Treatment subjects became more critical of conducting examples than of other disciplines.... The use of Laban vocabulary coincided with an increased comfort level and heightened ability to distinguish between levels of expressive movement (Neidlinger, 2003, p. iv).

A significant difference was found in comfort evaluating expressive gesture only in the re-posttest condition, or retention test, indicating a latency effect with increased comfort levels of the Laban group. At least in the re-posttest condition, students receiving Laban instruction were more comfortable rating expression and more accurate in their ratings. The strong design of this study, paired with some statistically significant results, lent credence to the idea that Laban-based conducting instruction has value. However, this experiment alone cannot create conclusive evidence. Additionally, the inability for participants to identify expressive behavior across disciplines could indicate that only through Laban-training within a specific discipline did expressive movement become identifiable. It may have been an indication that the Laban treatment was not long enough to transfer to other disciplines, but a longer treatment could have been helpful for identifying expressive gesture in other movement disciplines. Or, it could have simply indicated that the types of questions being asked of other disciplines were not specifically accessible to this group of participants. Whatever the reason, this finding brought into question the usefulness of labeling expressive movement through Laban for the untrained observer, a question revisited by this current study.

Researchers have also completed quasi-experimental studies focusing on the influence of LMA ensemble instruction upon choral musicianship (Jordan, 1986; Holt, 1992). Jordan tested individual rhythmic performance of two groups of high school choral students, students trained

in Laban and students with no Laban training. He found that regardless of the student's rhythmic aptitude, the Laban group had better rhythm in the posttest. Similarly, Holt tested the impact of Laban training in a choral rehearsal upon style in a choral performance. The Laban group received much higher performance ratings than did the non-Laban group who received no movement training during their rehearsal period. The most obvious issue with the claims of this experiment is that the Laban group is being compared with a group receiving no movement treatment of any kind. The researcher does not address whether it is movement instruction more generally, or LMA instruction specifically, that impacts the experiment group. A strong continuation of this line of inquiry would include a comparison of Laban-based movement instruction and a different type of movement-based instruction upon choral musicianship and performance ratings.

More recently, researchers have attempted to identify specific expressive gestural language in conducting performances (Benge, 1996), and to create an *Action Drive*-centered gestural palette using feedback both from Certified Laban/Bartenieff Movement Analysts (CLMA) and choristers to find gestures that were effectively understood in a rehearsal setting (Billingham, 2001). Benge (1996) gathered professional conductors to identify expressive gestures on pre-existing conducting videos to support his assertion that kinesthetic qualities can be perceived visually. Laban-certified professionals then reviewed these gestures to determine the expressive qualities of the movement. *Effort*, *Shape*, and *Space* categories in Laban Movement Analyses were incorporated into the rubric the movement analysts used for documenting their observations. Though the *Effort* category of the rubric was complete with individual *Effort Elements*, as well as *States* and *Drives*, the *Shape* category was limited to *Modes of Shape Change*, and the *Space* category included only vertical, horizontal, and sagittal

dimensions. Analysts alluded to Laban's *Body* category in the comment sections, but it did not play a role in the movement profiles created for each conductor or connections to musical material. The movement profiles were built based upon the expressive moments identified by the analysts during muted conducting videos.

Though there was variation in the specific expressive gestures of each conductor, patterns of movement began to align with the musical gestures present during the original filming of the conductors. Crescendos were often created by increasing *Bound Flow* and/or *Strong Weight*, as well as by making a wider gesture (*Spreading*) and/or moving the gesture toward the ensemble (*Advancing*). Gestures for diminuendo decreased in size by *Narrowing* and pulling away from the ensemble (*Retreating*). When a sound was characterized as having a darker timbre, the gesture often appeared very low in the frame of the body. For shifts in articulation, shifting the *Weight* of the movement influenced the quality of the attack, as did sudden changes in speed (*Quick Time*). In the most general sense, mood changes were often represented by *Effort* changes, which most strongly influence the physical representation of musical articulation and dynamics. Though CLMAs made these visual observations, Bengé suggests in his discussion section that his findings could be similar for people with and without movement training. This was an intriguing prospect, and consequently it guided the participants for my Laban-based conducting research.

In Billingham's (2001) dissertation research, she instructed a collegiate choir in LMA while crafting iconic left-hand gestures to represent each configuration of *Action Drive*. Through CLMA feedback and repeated survey feedback over the course of a semester from her collegiate choir, she developed gestures that were consistently identified for six of the eight *Action Drives*: *Dab*, *Flick*, *Punch*, *Glide*, *Float*, and *Press*. The gestures for *Slash* and *Wring* were inconsistently

identified by members of her collegiate choral ensemble. Billingham did not include empirical information about determination of consistency in her results, but based upon the careful construction of the assessments throughout the data collection process, consistency would certainly imply a response rate greater than fifty percent, or chance. The inconsistent results could be influenced by several things: perhaps those two configurations of *Action Drive* were harder to perceive or execute and would have required more feedback for accuracy; perhaps by placing these specific gestures into left hand-only configurations, they lost some of the whole-body character necessary for accurate perception; or, perhaps those configurations were simply less memorable for the students and they never really learned them. The success of six of these configurations spoke to the relative ease with which students can learn to identify expressive gestures and incorporate them into a choral rehearsal. Whether these gestures are then transferrable to a different conductor or a different ensemble is another issue.

Research linking conducting gestural information with perception and meaning remains limited. The use of the language of Laban has helped some research more pointedly identify links between movement and musical meaning (Maes, Van Dyck, Lesaffre, Leman, & Kroonenberg, 2014). Broughton and Stevens (2012) assessed temporal analysis consistency among expressive descriptions, and combined those findings with more general LMA imagery information to create a clearer picture of the current research featuring the language of Laban Movement Analysis. Broughton and Stevens (2012) used three types of temporal analysis to ascertain how accurately musicians could identify expressive performance gesture after brief training in LMA. Agreement exceeded 90% when asking participants to verify the Laban analysis, but diminished markedly when participants constructed their own independent Laban analysis.

Limitations with this study may have included insufficient training with the Laban language, too much temporal information presented simultaneously for accurate study, or a misunderstanding of expressive gesture when analyzed by non-marimbists. Neidlinger (2003) demonstrated that conductors inconsistently identify expressive gesture for dance, figure skating, and mime. This limitation across areas of artistic expertise lent credence to the inconsistency in Broughton and Steven's (2012) research and posed a potential challenge for consistent ensemble members' perception if they had no conducting training.

The research of Maes et al. (2014) investigated the correlation of movement with musical content, linking LMA *Effort* and *Shape* category vocabulary to musical qualities. The researchers asked musicians and non-musicians to move freely to music, and then complete a survey of opposing musical adjectives to describe their experiences. Heroic music resulted in movements featuring *Strong Weight*, *Quick Time*, and both *Direct* and *Indirect Space*. The *Space Factor* vocabulary attributed to the heroic music was "compact" and "dense" when referring to *Direct Space*, and "chaotic" and "unbalanced" when referring to *Indirect Space*. Improvisational movements when responding to lyric music resulted in *Light Weight*, *Sustained Time*, and again both *Direct* and *Indirect Space*. The *Space Factor* vocabulary attributed to the lyric music was "regular" and "balanced" when referring to *Direct Space*, and "airy" and "diffuse" when referring to *Indirect Space*. Either the *Space Factor* vocabulary was unclear to participants, or components of the entire *Space Factor* were useful in describing highly contrasting musical styles.

When discussing components of Laban's *Shape* category and their relationship to musical qualities, positive correlations were found between heroic music and *Rising* and *Spreading* gestures, while lyric music was aligned with gestures of *Enclosing* and *Sinking* (descending).

The only difference between the groups was gesture size and height, with non-musicians making shorter, smaller gestures. The difference in results between the musician and non-musician groups may relate to their discomfort with the activity. There was no difference between group descriptions of music. Because of the consistency between movement and music vocabulary, and the similarity between groups, the researchers demonstrated that LMA was a reliable way to describe movement empirically.

I loosely based this current study on Billingham's (2001) gesture creation study, not only because her work informs much of my LMA conducting vocabulary, but also because Billingham called for future researchers to adapt the gestural vocabulary she developed to a traditional beat pattern and to "eliminate confusion from adapted gesture which remained in a free form to better represent the inner intent of the *Effort Elements*" (2001, p. 76). In 2009, Billingham published *The Complete Conductor's Guide to Laban Movement Theory*, a comprehensive introduction to Bartenieff principals of body patterning and Laban Movement Theory for conductors. This book was the next step of development in her Laban-based conducting instruction. The format included explanations and charts, followed by exercises to develop each skill as it is introduced. This resource was important for the application of specific Laban gestures to conducting and the acquisition of gestural and movement proficiency. Unlike a traditional conducting textbook, it was highly movement based, requiring the reader to move through the activities for full concept comprehension. Additionally, the descriptions for conducting with *Slash* and *Wring* were amended from those present in her original 2001 dissertation research, and in my opinion, were clearer. Billingham was the first conductor to become a Certified Laban/Bartenieff Movement Analyst, and the care and rich detail with which she taught Laban for conductors in her 2009 publication and through her workshops

demonstrated the depth of her knowledge and commitment to Laban-based movement instruction.

Billingham's call for further research in ensemble understanding of LMA-based conducting gestures, paired with Neidlinger's cross-disciplinary work in young conductors' perceptions of expressiveness (2003), paved the way for research focusing on ensemble members' perceptions of expressive gestural qualities. More specifically, I am using the language of Laban to describe various qualities of movement in the conducting gesture – as with Maes et al.'s (2014) approach. Because of the success of Maes et al. (2014) in using the language of Laban for empirical research, its use in the current format seemed consistent with past research. Additionally, this study stayed firmly in the *Effort* category, which aligned with earlier Laban-based conducting research and many Laban-based conducting instructional materials.

It was not my goal with this research to justify training conductors or ensemble members in Laban, but to instead see if systematic inquiry could begin to determine whether the language of Laban provides a meaningful way of describing movement for people without Laban-based conducting training. It is my philosophy that the movements of conductors should be aligned with an untrained understanding of movement and sound production as often as possible, to minimize communication barriers between conductors and ensembles. In the most general sense, this study addresses which, if any, components of Laban's *Effort* category may be consistently identifiable to ensemble members with no conducting training.

Chapter 3. METHODOLOGY

3.1 STATEMENT OF THE PROBLEM

The purpose of this study was to evaluate perceptual accuracy of choral ensemble members with no formal conducting training, and to give their ratings context through comparison with a group of Laban-trained conductors. These two groups evaluated ensemble conductors by rating the qualities they saw in various conducting gesture examples. This study provided some information regarding what conducting gesture qualities are consistently identified by each group, and used Laban's movement quality labeling system (*Effort*). The choral ensemble members (Novice group) had experience singing in choirs, but had received no formal conducting training of any kind, including in Laban Movement Analysis. Because the study used concepts and vocabulary from Laban Movement Analysis (LMA) in a conducting context, the group of trained conductors (Laban group) not only had general expertise in conducting but also LMA-specific conducting training. Due to these two types of expertise, the Laban-trained conductor group represented the most content expertise possible for this research study. The null hypothesis stated that there would be no significant difference between choristers without formal conducting instruction and Laban-trained conducting students among ratings of the Laban *Effort Factors* of *Time*, *Weight*, or *Space*. Specific research questions included: 1) Will there be a significant difference between the observations of choristers with no conducting training and Laban-trained conductors among the Laban *Effort Factors* of *Time*, *Weight*, and *Space*? 2) Will either group identify the *Effort Factors* of *Time*, *Weight*, and *Space* at a rate significantly greater than chance?

3.2 CREATING VIDEO STIMULI

3.2.1 *Participants*

I used four expert conductors with Laban training to create the video stimuli for the study. These conductors included one female and one male instrumental conductor, from two different Midwestern colleges, and one female and one male choral conductor from the same mid-Atlantic college. Though the specifics of their experience varied, all conductors had worked with incorporating Laban Movement Analysis into the undergraduate conducting curriculum, had studied with Certified Movement Analysts or Certified Laban/Bartenieff Movement Analysts for their own graduate conducting training, and/or had previously incorporated LMA into their graduate and professional research. Because none of these conductors were known to the study participants, there was no bias based upon familiarity with a given conductor. Equal representation of both sexes, limiting variation in conductors' physical appearances through long-sleeved black shirts, and the inclusion of both choral and instrumental conductors was intended to account for biases in physical appearance and background influencing perception of conducting. To further standardize the visual appearance of all conductors, I filmed them against a consistent, gray backdrop.

Video stimuli conductors were instructed to audiate as if they were conducting the first eight bars of "Alouette" at eighty beats per minute in eight different styles. The selection was chosen because of its familiarity as a folk song with the conductors, and because it was simple to alter the style of the music without an alteration in tempo. Each of the eight different styles embodied one of Laban's *Action Drives* – *Dab*, *Flick*, *Slash*, *Punch*, *Press*, *Wring*, *Float*, and *Glide*. The chart of *Effort Elements* indicating which end of the continuum is required for *Effort Factor* is listed in Table 3.1.

Table 3.1 Laban's *Action Drive* configurations

<i>Action Drive</i>	<i>Time</i>	<i>Weight</i>	<i>Space</i>
<i>Dab</i>	<i>Quick</i>	<i>Light</i>	<i>Direct</i>
<i>Flick</i>	<i>Quick</i>	<i>Light</i>	<i>Indirect</i>
<i>Slash</i>	<i>Quick</i>	<i>Strong</i>	<i>Indirect</i>
<i>Punch</i>	<i>Quick</i>	<i>Strong</i>	<i>Direct</i>
<i>Press</i>	<i>Sustained</i>	<i>Strong</i>	<i>Direct</i>
<i>Wring</i>	<i>Sustained</i>	<i>Strong</i>	<i>Indirect</i>
<i>Float</i>	<i>Sustained</i>	<i>Light</i>	<i>Indirect</i>
<i>Glide</i>	<i>Sustained</i>	<i>Light</i>	<i>Direct</i>

During the filming of the potential stimuli videos, one of the other stimuli conductors and I gave Laban-based gestural feedback between each video take. Each video stimuli conductor recorded examples until both the conductor and researcher found a minimum of four satisfactory examples of each *Action Drive* configuration, creating at least thirty-two examples for each conductor. We occasionally recorded more than four examples of a given *Action Drive*, and in those cases I narrowed the examples down to four when reviewing the videos after the recording session.

3.2.2 *Expert Judges*

To determine which recording of the eight *Action Drive* configurations would be used in the final stimuli video shown to participants, the 32 examples recorded of each conductor – 128 total examples – were distributed to another set of three Laban-trained expert conductors for ranking. These experts were either Certified Laban/Bartenieff Movement Analysts who are also collegiate conductors, or collegiate conductors who use Laban-based conducting strategies in their university conducting classes and have engaged in previous Laban-based research. For this

phase of analysis, these experts ranked the videos of each conductor by *Action Drive* configuration. For example, the expert judges would view video stimuli Conductor A examples, labeled *Dab A*, *Dab B*, *Dab C*, and *Dab D*.

After viewing the videos, the experts ranked the videos based on their impressions of accuracy. Once finished ranking videos from best example to poorest example, 1 – 4, the experts viewed the next set of four videos. Because the goal was for these judges to feel confident with their rankings, they could view the videos as many times as necessary. The expert judges occasionally determined that two videos were identical and gave identical rankings. I accepted their minor scoring alterations and used their indicated rankings to create a composite ranking for each video. The video example for each *Action Drive* configuration by each conductor with the lowest composite ranking was determined to be the best example, and was then used in the final video stimulus shown to participants.

3.2.3 *Final Video Stimuli*

I selected thirty-two total videos for inclusion in the video stimulus, consisting of the best-ranked example of each of the eight *Action Drive* configurations by each of the four conductors. The completed stimulus video included three sections for rating each of the three *Effort Elements* on their *Effort Factor* continuum: the first section for ranking *Time*, the second section for ranking *Weight*, and the third section for ranking *Space*. Due to the presentation of each *Effort Factor* separately, participants viewed all thirty-two videos three times – once per section, keeping the focus on one specific movement quality per section. Videos were ordered randomly at first, and then reviewed and adjusted so that no conductor and no *Action Drive* configuration was viewed consecutively. Repeating this process for sections two and three

produced an independent order for each section. I included six practice examples (two per *Effort Factor*), selecting them from other highly ranked videos not included as one of the 32 final video examples. The practice examples were 2:11 long, and the test sections were 9:40 for *Time*, 9:41 for *Weight*, and 9:40 for *Space*, for a total video length of 31:12.

3.3 CREATING RESPONSE MATERIALS

3.3.1 *Determining Semantic Differential Scale Scores*

I created scores for *Effort Element* gesture quality assessment on a semantic differential scale. These scores were assigned with the assumption that the accurate execution of each *Effort Element* should fall at the end of the 6-point continuum. This meant an accurate score was either a 1 or a 6, depending on the end of the continuum upon which it resided. Please see below (Table 3.2) for the complete outline of each score.

Table 3.2 Laban's *Effort Factors* with semantic differential scores

Effort Factor	Continuum Edge 1	Continuum Edge 2
<i>Time</i>	<i>Quick</i> (1)	<i>Sustained</i> (6)
<i>Weight</i>	<i>Light</i> (1)	<i>Strong</i> (6)
<i>Space</i>	<i>Direct</i> (1)	<i>Indirect</i> (6)

These semantic differential scales quantify the *Effort Elements* for analysis, and were used in alignment with the response sheets presented to participants for scoring. On the response sheet, participants chose anything on the spectrum from 1 – 6, allowing each *Effort Element* to function on a continuous spectrum, as it does in realistic movement examples. This also gave the participants an opportunity to rate the degree to which they agreed that a video revealed *Quick Time*, for example. If the respondent marked a 1, this indicated strong agreement that the

example was *Quick*, whereas a rating of 3 still falls on the *Quick* end of the continuum but does not indicate strong agreement (see Table 3.3).

Table 3.3 Laban's *Action Drive* configurations with semantic differential scores

<i>Action Drive</i>	<i>Time</i>	<i>Weight</i>	<i>Space</i>
<i>Dab</i>	<i>Quick (1)</i>	<i>Light (1)</i>	<i>Direct (1)</i>
<i>Flick</i>	<i>Quick (1)</i>	<i>Light (1)</i>	<i>Indirect (6)</i>
<i>Slash</i>	<i>Quick (1)</i>	<i>Strong (6)</i>	<i>Indirect (6)</i>
<i>Punch</i>	<i>Quick (1)</i>	<i>Strong (6)</i>	<i>Direct (1)</i>
<i>Press</i>	<i>Sustained (6)</i>	<i>Strong (6)</i>	<i>Direct (1)</i>
<i>Wring</i>	<i>Sustained (6)</i>	<i>Strong (6)</i>	<i>Indirect (6)</i>
<i>Float</i>	<i>Sustained (6)</i>	<i>Light (1)</i>	<i>Indirect (6)</i>
<i>Glide</i>	<i>Sustained (6)</i>	<i>Light (1)</i>	<i>Direct (1)</i>

3.3.2 Creating Participant Response Instrument

Each student first completed a *Music and Movement Background Survey* that included basic demographic information, information about their music background and movement background, and specific questions regarding their experiences in Laban-based conducting instruction. This information was used to determine group placement for data analysis, and no identifiable information was collected on any of the participants. As mentioned above, the students responded to videos using semantic differential response scales. The response sheet instructed students to circle their answer for each video example, and the sheet presented a new answer scale for each video example. Below (Figure 3.1) is an example of a *Time* scale.

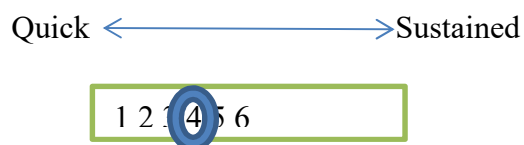


Figure 3.1 Semantic differential scale example for *Time Effort Element*

Please refer to *Huntleigh – Dissertation Data Collection Sheet* in Appendix B for specific background questions, and to see the complete layout of the background form and semantic differential scale responses.

3.4 PARTICIPANTS

I recruited participants for this study using the snowball method, reaching out online via email and social media both to find choristers with no conducting training at a large research university in the Pacific Northwest, and also to locate Laban-trained choral conductors at the same institution. Because this university offers Laban-based conducting courses at both the undergraduate and graduate levels, this environment had an uncharacteristically large population of Laban-trained conductors. Both the choristers with no conducting training and the Laban-trained conductors recruited for this research study participated in ensembles at the university, so all students could be contacted through those affiliations.

I divided participants into two groups for analysis: 1) choral ensemble members with no formal conducting instruction (Novice, $n = 21$) and 2) Laban-trained conductors (Laban, $n = 24$), determining groups by the *Music and Movement Background Survey* that they completed at the beginning of the study session. In this questionnaire, I collected demographic information such as age, gender identity, and education level, as well as some general information about musical and movement experiences. The Novice group included 14 female participants, 6 male participants, and 1 participant with a non-conforming gender identity; the Laban group included 10 female participants and 14 male participants (Figure 3.2).

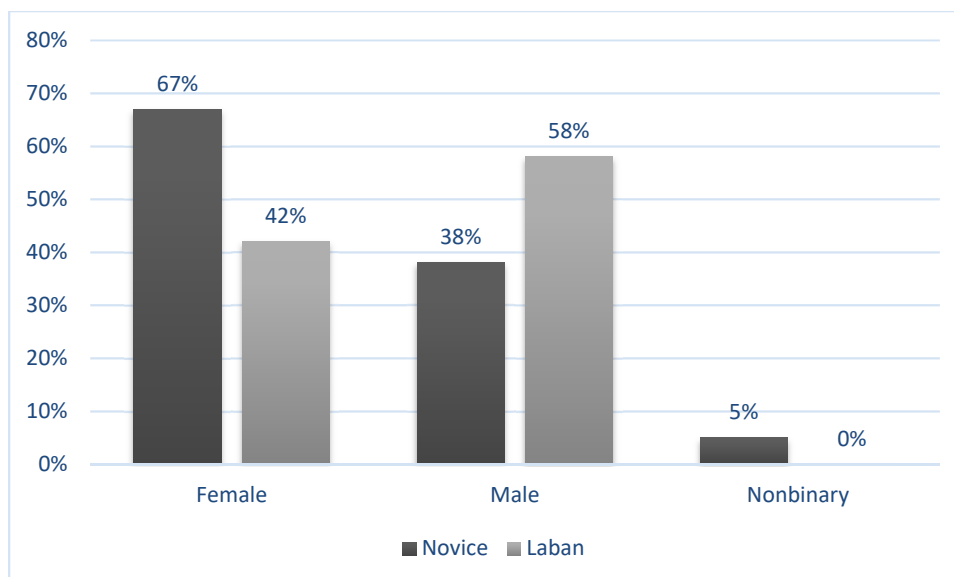


Figure 3.2 Gender identity of participants

Participants' ages were collected by identifying age categories, rather than individual ages. As all participants were of the age of majority, categories included: 18-24; 25-34; 35-44; 45-54 and 55+. Novices included 18 in the youngest age category, 1 in the 25-34 category, and 2 in the 55+ category; Laban participants included 8 in the 18-24 age category; 11 in the 25-34 category, 1 in the 35-44 category, 3 in the 45-54 category, and 1 in the 55+ category (Figure 3.3).

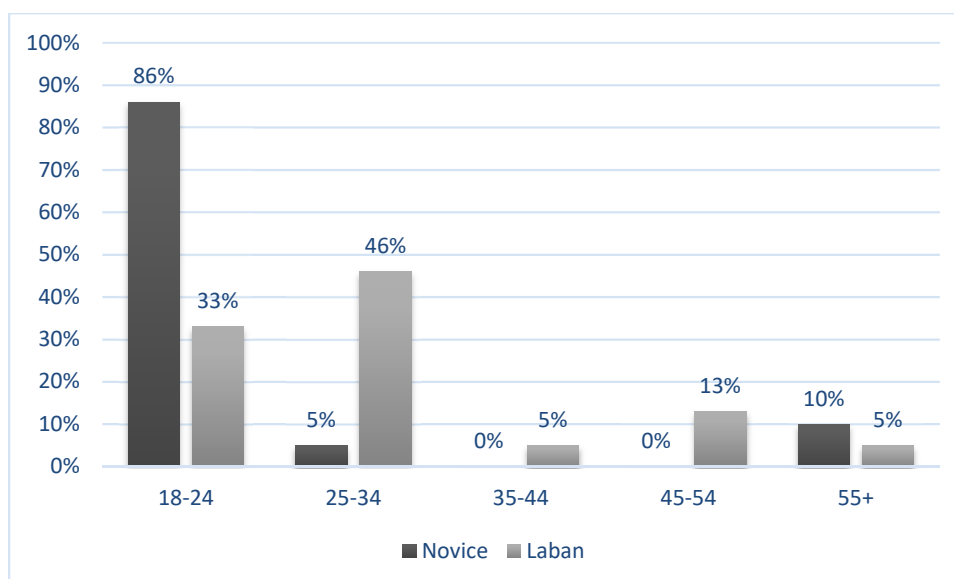


Figure 3.3 Age category of participants

The Novice group included 18 participants who had completed a high school degree, 1 participant who had completed an undergraduate degree, and 2 participants with a graduate degree; The Laban group had 4 participants that indicated that their highest degree completed was a high school diploma, 8 participants who had completed an undergraduate degree, and 12 participants who had completed a graduate degree (Figure 3.4).

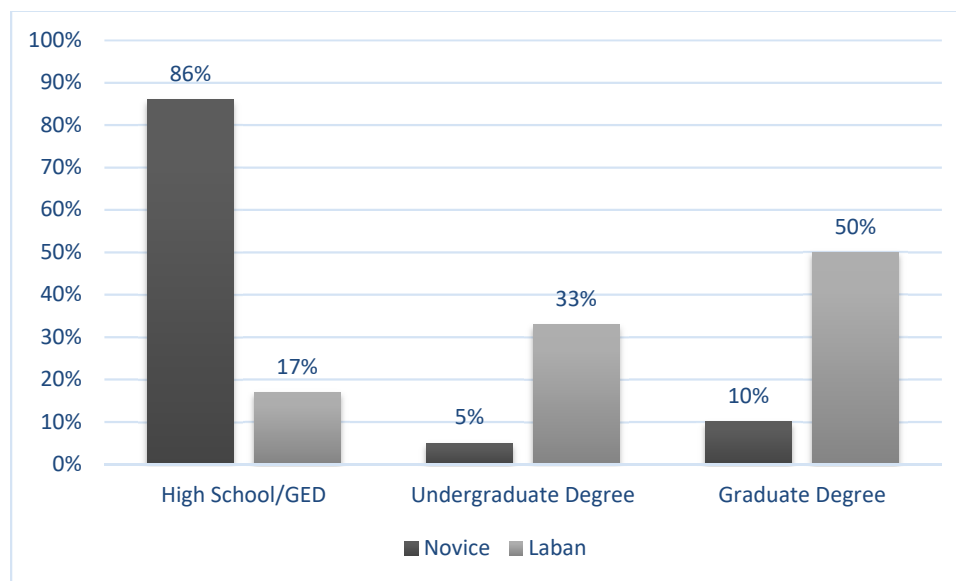


Figure 3.4 Highest educational attainment of participants

Participants from both groups could complete the study simultaneously, since division was only necessary for analysis and was based upon their *Music and Movement Background Survey* completed at the beginning of the research session. For analysis, one group consisted of graduate and undergraduate students currently or formerly enrolled in any curricular choir, and who did not have any formal conducting training; the second group consisted of graduate and undergraduate students with Laban-based conducting instruction. Since the type and variety of participants with non-conducting movement experience varied greatly in both the Novice and the Laban groups, I did not complete any separate calculations for these participants. As people are natural movers, it makes sense that throughout the course of a lifetime, participants may have

studied dance, participated in social dance, or completed some other type of movement training. Four participants, two included in each participant group, stated that they had previous Laban-based dance experience. I decided that this group was too small for analysis and simply left them in their respective participant groups. Please see below (Table 3.4) for a composite listing of these movement experiences.

Table 3.4 Movement experiences by participant group

Background Activity	Novice	Laban
Studio Dance Classes	33%	50%
Private Dance Instruction	24%	6%
Ballroom/Swing/Etc. Classes	29%	54%
Laban-Based Dance Instruction	10%	8%
Bachelor's Degree in Dance	-	-
Graduate Certificate in Dance	-	-
Graduate Degree in Dance	-	-
Show Choir	29%	21%
Marching Band	14%	25%
Music Theater Productions	62%	63%
Dance Team	10%	-
Other	-*	13%*

* One respondent from Novice and one from Laban removed for listing non-movement experience (opera, pit orchestra) in "other" section for movement.

3.5 PROCEDURE

Research sessions took place in a campus classroom, and involved small groups of participants, ranging from two to twelve per group. The room had a large television monitor for viewing, and individual desks situated so that each desk had an unobstructed view of the screen. Each session began with an introduction to the study, explaining its voluntary nature and presenting the information necessary for adherence to the Belmont Principles. As the study materials appeared via a seamless video, all sessions were equivalent in length.

After the introduction, participants completed a brief background survey to determine their eligibility for analysis in either 1) the novice choral ensemble group (Novice, $n = 21$) or 2) the Laban-trained conducting group (Laban, $n = 24$). Following the background survey, I instructed all participants to rate the conducting gestures based upon the movement quality that they perceived in each silent video stimulus. Additionally, I informed participants of the importance of their own interpretations of the terms identified on the semantic differential scales on the answer sheets. For this reason, I offered no specific definition of any term to the group. The reasoning for this decision was two-fold: 1) I did not want to taint the judgement of the participants by offering specific examples of what each end of the spectrum could look like, and 2) the inherent usefulness of these concepts and vocabulary outside of trained Laban practitioners is dependent on their usefulness for non-Laban trained observers. Before beginning the formal study, each group of participants completed six practice questions where students rated the conducting gesture quality in each video example on a 6-point semantic differential scale. Students viewed the video stimulus on the screen together, and then responded individually on their paper answer sheets. The video contained four sections: Practice Examples including all three *Effort Factor* response types, Section One for observing *Time*, Section Two for observing *Weight*, and Section Three for observing *Space*. There was a brief pause between each section. Because of the formatting of the study, students could focus their evaluations on a single *Effort Factor* in both the practice examples and the formal study examples. All thirty-two video examples are identical for each section, though presented in a different order.

The first practice question mirrored the formatting of Section One of the study, with the participants exclusively focused on the *Effort Factor* of *Time*. The semantic differential scale for this section reflected *Quick Time* at the end of the continuum labeled 1, and *Sustained Time* at

the other end of the continuum, labeled 6. Students could rate the conducting gesture quality of *Time* anywhere on the 6-point semantic differential scale. Practice example three and four had students focus on the *Effort Factor* of *Weight*, as aligned with the Section Two of the study; Practice example five and six focused on the *Effort Factor* of *Space*, reflecting the expectations of Section Three of the study. An open question and answer period followed the three practice questions.

If questions were too specific and risked the integrity of the participant's individual judgement, then I simply informed them that I could not answer that question, and reminded them that I was interested in their interpretations more so than their certainty with being, or feeling, accurate. Because the answers reflected their observations, they inherently provided the most accurate information possible. After the question and answer period had ended and all participants seemed comfortable with the procedure, they viewed the three sections of study stimuli videos in complete silence; the research study room remained silent until the end of the third and final section.

During the presentation of Section One, Section Two, and Section Three, participants were asked to respond immediately after each video on a paper response sheet. In the video series, there was a short video example followed by a five second screen with the text, "please mark your answer." Each question had a title screen identifying itself – e.g. Section One, Question 1, so that the participants knew which example they were watching. Secondly, the sudden change in the screen content helped to visually cue the participants of the switch to the next question in their peripheral vision, even if their attention was focused on their answer sheets. Each section of the survey had thirty-two examples, providing thirty-two individual data

points for each *Effort Factor*. Participants answered a total of ninety-six questions preceded by six practice questions – two practice questions for each section of the questionnaire.

3.6 ANALYSIS

In this study, choral singers without conducting experience (Novice, $n = 21$) and experienced choral conductors with training in Laban Movement Analysis (Laban, $n = 24$) evaluated 32 brief video segments of four conductors employing predetermined Laban *Effort Factors*. Participants viewed the video segments three times, evaluating one *Effort Factor*—*Time*, *Weight*, or *Space*—during each viewing. Participants responded using 6-point differential scales that paired descriptive terms—*Quick/Sustained*, *Light/Strong*, and *Direct/Indirect*—each depicting contrasts within their respective *Effort Factors*.

Raw data for each participant consisted of 96 ratings (32 video segments x 3 viewings, one focusing on each *Effort Factor*) scored 1-6. Because video segments depicted specific *Effort* qualities, each response could be evaluated according to whether it correctly showed the intended quality. To accomplish this, I transformed participants' responses so that all “correct” descriptors were aligned with the same end of the differential scale (6); thus, correct responses were those that appeared on the high end of the scale (responses of 4, 5, or 6). I then calculated the frequency of correct (4, 5, 6) and incorrect (1, 2, 3) responses for each participant.

Scores from each group were computed for accuracy – percentage correct – and were also analyzed using a chi-square goodness of fit test to determine if accuracy was significantly different than accuracy by chance; to address any differences among accuracy by group membership, I used chi-square tests of independence. Correct scores accurately identified the *Effort Element* – *Quick*, *Sustained*, *Light*, *Strong*, *Direct*, or *Indirect* – in the video example, and

the percentage correct reflected the number of correct responses out of the total responses for that *Effort Factor*. If participants omitted a response, I omitted other similar responses in that specific analysis by response type. For example, if a participant skipped a question focusing on *Light Weight*, then I removed all *Light Weight* questions from that participant from the analysis. For this reason, the total number of participants varies by analysis type.

Chapter 4. RESULTS

4.1 *EFFORT FACTOR* IDENTIFICATION

The main research questions of this study were (a) whether participants would be able to identify intended Laban *Effort Elements* and (b) whether choral singers would demonstrate identification accuracy similar to that of experienced choral conductors with Laban training. To test the null hypotheses that among both groups of participants' identifications of intended *Effort Elements* would be no different than chance, I compared the frequency of correct and incorrect responses for each group for each of the three *Effort Factors*. Response frequencies and results of chi-square goodness of fit tests are below (Table 4.1).

Table 4.1 Frequency of correct/incorrect responses by *Effort Factor*

<i>Effort Factor</i>	Correct	Incorrect	Chi-square
<i>Time</i>			
Novice	530	110	275.63 *
Laban	727	41	612.76 *
<i>Weight</i>			
Novice	544	96	313.60 *
Laban	657	79	442.44 *
<i>Space</i>			
Novice	334	338	0.02
Laban	455	313	26.26 *

* $p < .008$ (Bonferroni correction)

For the *Effort Factors* of *Time* and *Weight*, participants in both groups performed significantly better than chance. Both Novice and Laban groups gave significantly more frequent correct responses than incorrect responses. For *Space* evaluations, responses of Novice participants were at the chance level; Laban participants again gave significantly more frequent correct responses, though at a noticeably lower rate than for *Time* and *Weight Factors* (see Figure 4.1).

Because both groups showed a significant propensity for correct responses (apart from the Novice group's responses to *Space* items), I used tests of independence to examine whether there was a relationship between frequency of correct/incorrect responses and group membership. Using a Bonferroni corrected alpha level of $\alpha = .017$, there was a significant relationship between response and group for both *Time* [$\chi^2(1, n = 1408) = 51.19, p < .017$] and *Space* [$\chi^2(1, n = 1440) = 13.18, p < .017$]. Even merely examining the columns shown in Figure 4.1, *Space* obviously caused problems for the participants. The mid-80s to low-90s percentile accuracy seen in the other two *Effort Factors* dissipates in the *Effort Factor* of *Space*, with accuracy percentages much more indicative of chance. Though it is also worth noting that there was no significant relationship between response and group for *Weight*, $\chi^2(1, n = 1376) = 5.61, p > .017$, as *Time* was the only *Factor* of the three where the Laban participants performed significantly better than the Novices, and also performed well overall.

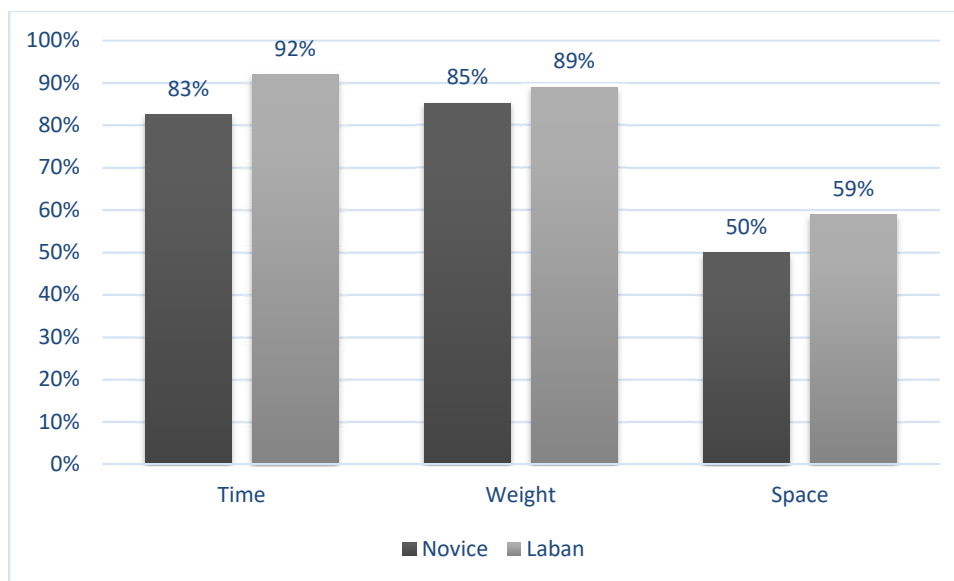


Figure 4.1 *Effort Factor* accuracy scores

4.1.1 *Strength of Identification*

Although statistical results reflected a difference in the degree of accuracy shown by the two participant groups, overall, Novice group members demonstrated response profiles largely similar to those of trained Laban conductors. They recognized intentions behind factors of *Time* and *Weight*, and both groups showed a considerably reduced rate of accuracy for *Space* items. However, my categorization of response ranges as correct (4, 5, 6) or incorrect (1, 2, 3) may have obscured more pronounced differences between the groups per strength of response.

Looking at the responses on the six-point differential scale, students of both groups demonstrated a similar profile, with 5 being the most common response for the *Effort Factors* of *Time* (Novice, 225 out of 640 total responses; Laban, 330 out of 768 total responses) and *Weight* (Novice, 230 out of 640 total responses; Laban, 290 out of 736 total responses). For comparison, Novices selected a response of 5 for only 115 out of the 672 responses in the *Space* category, and Laban conductors selected a response of 5 for 200 of the 672 responses in that same category. Figures 4.2, 4.3, and 4.4 on the following pages indicate the percentage of total responses for each number on the semantic differential scale for the categories of *Time*, *Weight*, and *Space*, respectively.

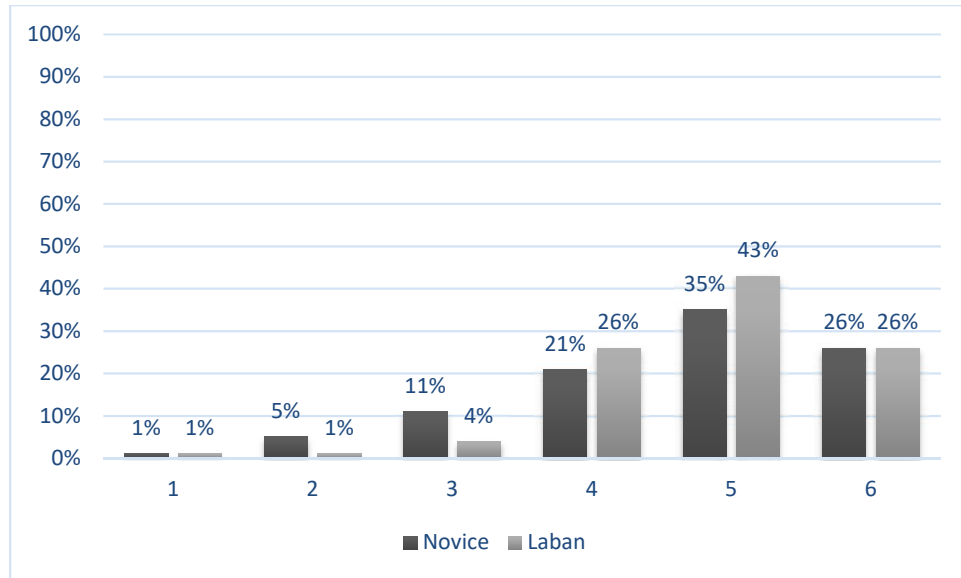


Figure 4.2 *Time Effort Factor*: responses for semantic differential scores 1-6

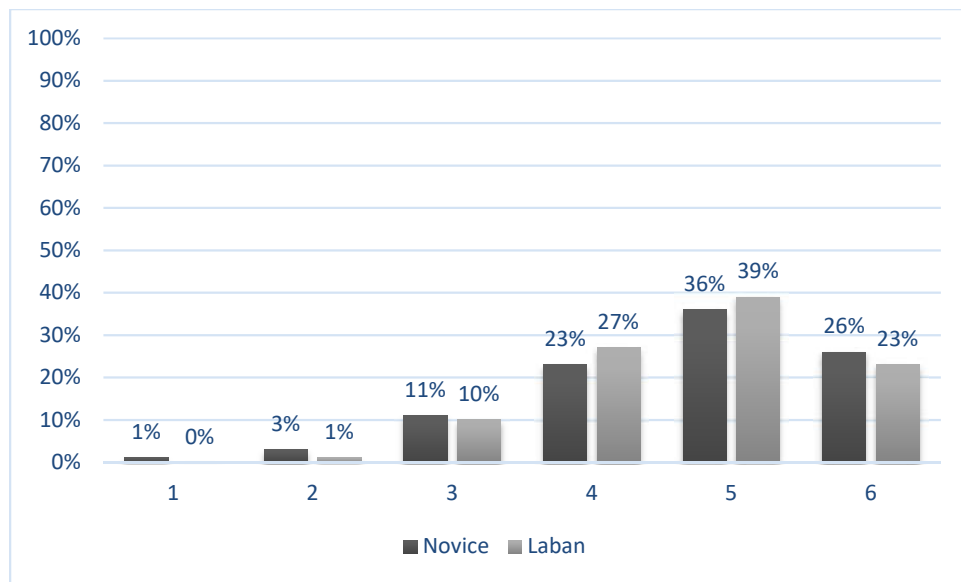


Figure 4.3 *Weight Effort Factor*: responses for semantic differential scores 1-6

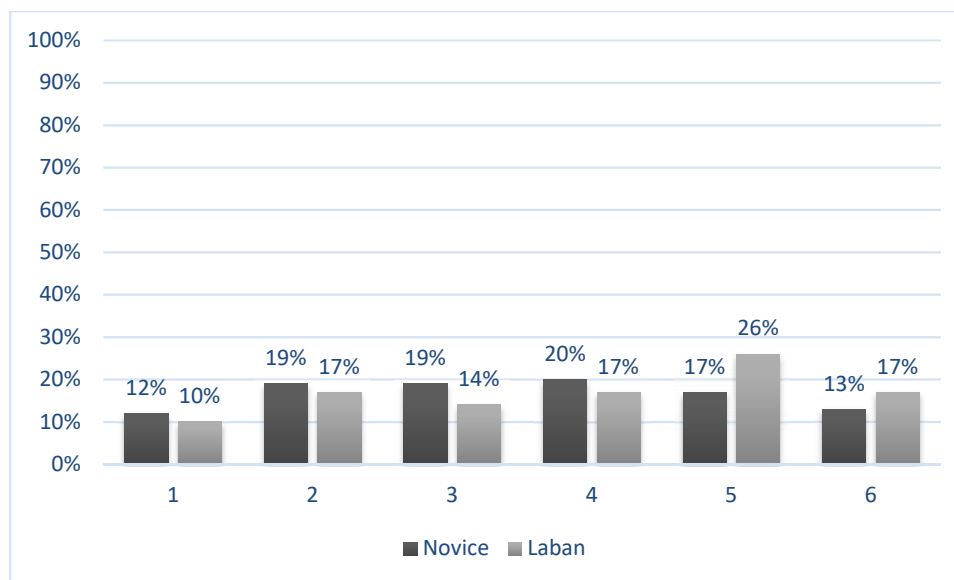


Figure 4.4 *Space Effort Factor*: responses for semantic differential scores 1-6

4.2 DIFFERENCES BY CONDUCTOR

I computed accuracy scores for each conductor across both participant groups to assess whether differences between groups could be attributable to individual differences among the four conductors. The primary function of this category of analysis was to affirm the validity of these stimuli conductors. While the study carefully constructs these examples through coaching and blind assessment by expert raters, the results also offer commentary on their validity for evaluating these questions. *Conductor C* had the smallest difference in correct responses between Novice and Laban respondents, with only a 5% difference (Novice, 73%; Laban, 78%), while *Conductor B* had the largest, seeing a 12% difference (Novice, 74%; Laban, 86%). (see Fig. 4.5).

Response profiles between Novice and Laban participants were consistent across the four conductors, with Laban-trained participants demonstrating a somewhat higher rate of accuracy across the four stimuli conductors. Both groups showed an overall strong capacity to correctly evaluate the conducting examples, and based on this consistency of responses I concluded that

evaluations were distributed in a largely uniform manner across conductors, and that differences between groups were not the result of individual conductor differences (see Figure 4.5).

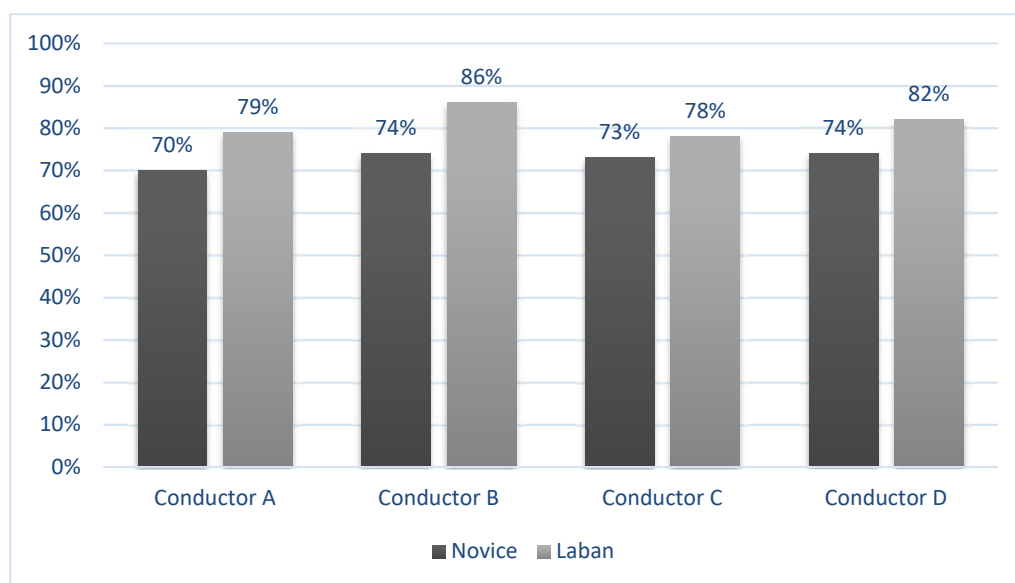


Figure 4.5 Accuracy by conductor

4.3 ISOLATING *EFFORT ELEMENTS*

Because each *Effort Factor* contains a pair of bipolar *Effort Elements*, I was curious whether one *Effort Element* was easier to detect than its bipolar counterpart. Such a difference within any of the *Effort Factors* of *Time*, *Weight*, and *Space* could help more specifically describe the results discussed at the beginning of this chapter. The following section discusses whether differences within the three *Effort Factors* were significant, and if there were differences between participant groups for any individual *Effort Elements*. The smallest difference between Novice and Laban conductors was for the *Effort Element* of *Strong Weight*, where Novice respondents were 84% correct and Laban respondents were 83% correct (also the only measurable aspect where the Novices outperformed the Laban group). The section with the

largest difference was *Sustained Time* (Novices, 79%; Laban, 96%), though the response accuracy difference for *Direct Space* was also rather large. (see Figure 4.6).

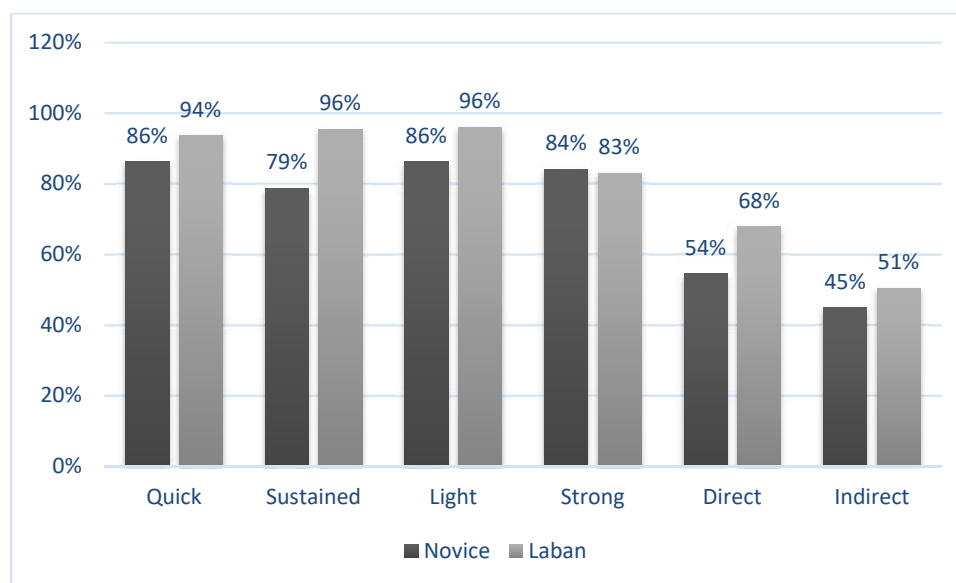


Figure 4.6 *Effort Element* accuracy scores

After calculating accuracy scores for each *Effort Element* – *Quick Time*, *Sustained Time*, *Light Weight*, *Strong Weight*, *Direct Space*, and *Indirect Space*, I then used chi-square tests of independence to examine whether there was a relationship between frequency of correct/incorrect responses and group membership. Using a Bonferroni corrected alpha level of $\alpha = .008$, there was a significant relationship between response and group for *Quick Time* [$\chi^2 (1, n = 720) = 22.47, p < .008$], *Sustained Time* [$\chi^2 (1, n = 704) = 45.28, p < .008$], *Light Weight* [$\chi^2 (1, n = 704) = 20.51, p < .008$], and *Direct Space* [$\chi^2 (1, n = 720) = 13.83, p < .008$]. *Strong Weight* and *Indirect Space* had no difference based upon group membership; Novices and Laban conductors rated these two *Effort Elements* similarly, demonstrating moderate accuracy (again Novices, 84%; Laban, 83%) for *Strong Weight*, and much less accuracy for *Indirect Space* (Novices, 45%; Laban, 51%). It is notable that differences by participant group for the *Space Factor* were primarily attributable to the accuracy of Laban participants' correct identification of

Direct Space (68%). To examine this further, I used goodness of fit tests to determine whether each group's responses to *Effort Elements* were different than chance (Table 4.2). As expected, among responses to *Space* items, only those of Laban participants for *Direct Space* were above chance levels.

Table 4.2 Chi-square test results by *Effort Element*

<i>Effort Element</i>	Correct	Incorrect	Chi-square
<i>Quick Time</i>			
Novice	277	59	141.44 *
Laban	360	24	294.00 *
<i>Sustained Time</i>			
Novice	253	67	108.11 *
Laban	367	17	319.01 *
<i>Light Weight</i>			
Novice	290	46	177.19 *
Laban	353	15	310.45 *
<i>Strong Weight</i>			
Novice	269	51	148.51 *
Laban	319	65	168.01 *
<i>Direct Space</i>			
Novice	183	153	2.68
Laban	261	123	49.59 *
<i>Indirect Space</i>			
Novice	151	185	3.44
Laban	194	190	0.04

* $p < .004$ (Bonferroni correction)

4.4 CONFIGURATIONS OF *ACTION DRIVE*

When Laban Movement Analysis is applied to conducting instruction, the *Effort* category is generally taught with an emphasis on the specific configurations of *Action Drive* – *Dab*, *Flick*, *Slash*, *Punch*, *Press*, *Wring*, *Float*, and *Glide*. While instruction includes executing each of the six *Effort Elements*, the crystallization of the eight combinations into communicative moments is usually the target. For this reason, and to ensure equal distribution of *Effort Elements* across video examples, every testing example contained one *Action Drive* configuration. Because it is

possible that any of the eight configurations may have influenced the accuracy of individual *Effort Element* ratings, I used tests of independence to examine whether there was a relationship between frequency of correct/incorrect responses and group membership. The biggest differences between Novice and Laban groups here appeared in *Press*; only 61% of Novice respondents answered correctly, while 76% of Laban respondents answered correctly. *Dab* and *Wring* also showed a double-digit percentile difference between Novice and Laban participants (Novice, 74%; Laban, 87%; and Novice, 68%; Laban, 80%; respectively). The smallest differences were in *Punch* and *Slash* (Novice, 90%; Laban, 93%; and Novice, 68%; Laban, 70% respectively). This is well in keeping with the lack of statistical significance seen in those latter two *Action Drives* (see also Figure 4.7).

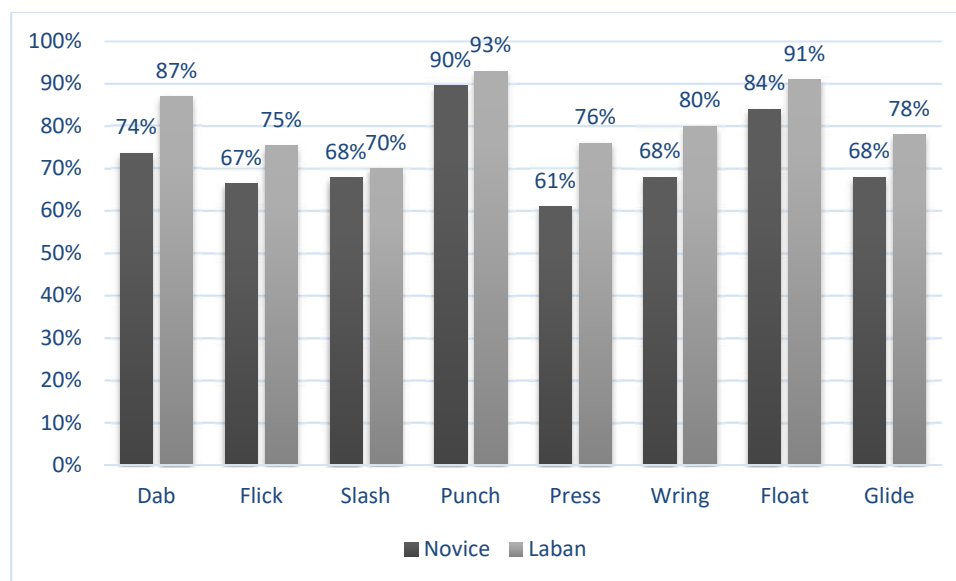


Figure 4.7 *Action Drive* configuration accuracy scores

I used chi-square tests of independence to examine whether there was a relationship between frequency of correct/incorrect responses and group membership. Using a Bonferroni corrected alpha level of $\alpha = .003$, there was a significant relationship between response and group for most *Effort Action Drives*, including *Dab* [$\chi^2 (1, n = 528) = 13.71, p < .003$], *Flick* [χ^2

(1, $n = 528$) = 4.86, $p < .003$], *Press* [χ^2 (1, $n = 528$) = 14.16, $p < .003$], *Wring* [χ^2 (1, $n = 528$) = 9.81, $p < .003$], *Float* [χ^2 (1, $n = 516$) = 4.86, $p < .003$], and *Glide* [χ^2 (1, $n = 516$) = 6.53, $p < .003$]. *Slash* and *Punch* showed no significant difference between ratings by Novice and Laban conductor groups; again, all raters were similarly minimally accurate for *Slash* (Novice, 68%; Laban, 70%) and maximally accurate for *Punch* (Novice, 90%; Laban, 93%). To examine this further, I used goodness of fit tests to determine whether each group's responses to *Action Drives* were different than chance (Table 4.3). As expected, because each *Action Drive* configuration contains *Time*, *Weight*, and *Space Factors*, it makes sense that scores would be raised above chance by the accuracy of *Time* and *Weight* categories.

Table 4.3 Chi-square test results by *Action Drive* configuration

<i>Action Drive</i>	Correct	Incorrect	Chi-square
<i>Dab</i>			
Novice	186	66	57.14 *
Laban	239	37	147.84 *
<i>Flick</i>			
Novice	168	84	28.00 *
Laban	208	68	71.01 *
<i>Slash</i>			
Novice	162	78	29.40 *
Laban	203	85	48.35 *
<i>Punch</i>			
Novice	216	24	153.60 *
Laban	269	19	217.01 *
<i>Press</i>			
Novice	147	93	12.15 *
Laban	220	68	80.22 *
<i>Wring</i>			
Novice	163	77	30.82 *
Laban	230	58	102.72 *
<i>Float</i>			
Novice	202	38	112.07 *
Laban	250	26	181.80 *
<i>Glide</i>			
Novice	163	77	30.82 *
Laban	215	61	85.93 *

* $p < .003$ (Bonferroni correction)

4.5 SUMMARY

The null hypothesis that there would be no difference among ratings of the Laban *Effort Factors* of *Time*, *Weight*, or *Space* between choristers without formal conducting instruction and Laban-trained conductors must be rejected, since results indicated that there was a difference between participant group ratings for the two *Effort Factors* of *Time* and *Space*, though there was no significant difference between group responses for the *Effort Factor* of *Weight*. For the second research question, whether the *Effort Factors* can be perceived accurately, the *Effort Factors* of *Time* (Novice, 83%; Laban, 92%) and *Weight* (Novice, 85%; Laban, 89%) were identified with reasonable accuracy, while neither group was notably more accurate than chance for the *Effort Factor* of *Space* (Novice, 50%; Laban, 59%). *Time* was the only *Factor* that the Laban participants performed significantly better than the Novices, and also performed well overall. Looking at the responses on the six-point differential scale, students of both groups indicated a similar profile, with 5 being the most common response for the *Effort Factors* of *Time* (Novice, 35%; Laban, 43%) and *Weight* (Novice, 36%; Laban, 39%). The distribution of *Space Factor* scores spread more evenly across all 6 responses.

When unpacking the above findings through analysis of *Effort Elements*, results revealed some crucial differences, particularly within the *Weight* and *Space Factors*. There was no difference in accuracy ratings between Novice and Laban conductor for *Strong Weight* or *Indirect Space*, highlighting that Laban conductors gained their accuracy advantage primarily through their ratings of *Light Weight* and *Direct Space*. Through the analysis of *Action Drive* configurations, I determined that *Slash* and *Punch* had no significant difference between ratings of Novice and Laban conductor groups; again, all raters demonstrated minimal accuracy for *Slash* (Novice, 68%; Laban, 70%) and maximal accuracy for *Punch* (Novice, 90%; Laban, 93%).

Across both groups, *Punch* and *Float* were the highest rated configurations of *Action Drive*, with no significant difference between Novice and Laban conductor ratings of *Punch*, and Novices rating *Float* with 84% accuracy, compared to the 91% accuracy of Laban conductors. While the differences listed above were present between groups and among *Effort* qualities, it is notable that choristers with no training could accurately identify some Laban-based gesture qualities, suggesting that there are different degrees of gestural meaning-making.

Chapter 5. DISCUSSION

5.1 CONTEXTUALIZING RESULTS

5.1.1 *Research Questions*

Question 1: Will there be a significant difference between the observations of choristers with no conducting training and Laban-trained conductors among the Laban *Effort Factors* of *Time, Weight, and Space*? The primary indicator for differences in scores was Laban movement training, since Laban conductors were more accurate than the Novice group across all categories. Being a kinesthetic expert had a positive impact upon accuracy, which aligned with Neidlinger's (2003) Laban-based research finding that conductors were able to consistently identify expressive conducting, but not other kinds of expressive movement.

For purposes of speculating about those differences between groups, it is helpful to address similarities and differences between group characteristics. Participants in both groups were active choral singers, and had university choral experience. Some members of the Novice group and most members of the Laban group played at least one musical instrument, could read Western music notation, and had more than five years of experience singing in a choral group. Definitively, the Laban group of participants had some general life experience differences, as they were mostly older and had completed a higher level of education. Laban group members possessed two major differences in training, having received Laban-based conducting training, and by proxy also general conducting training. Novices had neither experience with Laban, nor experience in a conducting class. For this reason, the specific type of expertise training gap likely to be indicative of accuracy differences cannot be determined, given the myriad ways the Laban group were as contrasting as possible from the Novice group of choristers. Because the Laban

group had a kinesthetic understanding of how these Laban-based conducting gestures feel, it makes sense that they would be more accurate than the Novice group. A visual understanding of the physical impact of a gesture can be confirmed through the LMA-based findings of Neidlinger (2003) where conductors accurately labeled the Laban qualities in conductors, but not in other visual arts. My findings also reinforce that kinesthetic understanding of expressive movement increases accuracy of visual perception (Wöllner & Cañal-Bruland, 2010).

Question 2: Will participants' ratings in each group and of each category be notably more accurate than chance? This descriptive data may resonate well with educators, who frequently grade student accuracy. As a Certified Laban/Bartenieff Movement Analyst and a conductor, I found this question to be fascinating and potentially informative for influencing both conducting pedagogy and gestural communication decisions during rehearsals and performances. Results indicated that *Time* and *Weight* were identified with reasonable accuracy by both groups (Novice, 83%; Laban, 92%; and Novice, 85%; Laban, 89%; respectively), while *Space* was not accurately identified by either group (Novice, 50% Laban, 59%). Training did increase accuracy and rating confidence, particularly in *Time* and *Weight* categories.

A couple of Laban-based conducting studies have explored the impact that LMA conducting has on ensemble musicians (Jordan, 1986; Holt, 1992), rather than the more common application to conducting instruction. While these researchers focused on the impact of Laban-based expressivity training on the musical output of an ensemble, I chose to give attention to choristers' visual perceptions in isolation. In a pilot study, I investigated the accuracy of *Effort Element* identification for choristers with varied LMA experience, including choristers with no Laban exposure, choristers with exposure to Laban-based conducting vocabulary in a rehearsal setting, and Laban-trained conductors. I found a significant difference in identifying the *Effort*

Elements of Time and Space between choristers with conducting experience, and both the group with no LMA experience and the group with LMA experience only in a rehearsal setting (Huntleigh, 2012). Additionally, all three groups were accurate at identifying the *Effort Elements of Time and Weight*. This accuracy supported the impact of Laban-based expressive gesture training on choristers (Jordan, 1986; Holt, 1992), and aligned with Benge's (1996) assertion that at least some kinesthetic qualities can be perceived visually while suggesting that his findings could be similar for people with and without movement training. Modifications to the stimulus video and scoring instrument were needed for continued research in this area, and those modifications are reflected in the design of the current study. The basic findings of my research questions are consistent with the pilot study, offering reinforcement that this line of inquiry could add value to the body of movement research.

5.1.2 *Isolating Effort Elements*

Isolating these *Effort Elements* was important for gaining a clearer understanding of accuracy ratings. Both groups scored above 70% accuracy, an accuracy level used in previous conducting gesture research (Sousa, 1988; Cofer, 1998) and generally considered to be a passing grade, on *Quick Time* (Novice, 86%; Laban 94%), *Sustained Time* (Novice, 79%; Laban, 96%), *Light Weight* (Novice, 86%; Laban, 96%), and *Strong Weight* (Novice, 84%; Laban, 83%). Laban conductors approached this 70% accuracy threshold for *Direct Space* (68%).

The largest difference between group scores among *Effort Elements* was for *Sustained Time*, which Novices rated with a moderate 79% accuracy, while Laban conductors were maximally accurate at 96%. However, the most interesting finding revealed through *Effort Element* analysis was no significant difference for *Strong Weight* accuracy (Novices, 84%;

Laban, 83%) by group membership. This difference could be explained a few ways: 1) through the specific kinesthetic experience of the conductors, 2) through the multiplicity of *Weight Factor* functions within LMA, or 3) through a limitation in expressive human movement that is not easily overcome during conducting training.

If the Laban group relied upon their motor expertise to determine whether the Laban stimuli conductors were using *Strong Weight*, and those stimuli conductors accessed their sense of *Strong Weight* differently, that could explain the similarity in ratings by Novice and Laban groups. Put another way, if the motor expertise of the Laban group did not align with the movement of the stimuli conductors, they would have no advantage over the Novice group in their visual perceptions of those *Strong Weight* gestures. During my own training, we frequently discussed a threshold for perceiving *Weight*. For those of us who had a movement signature that included *Strong Weight*, it was difficult for us to perceive that *Effort Element* in others who did not use *Strong Weight* as a part of their repeated, daily movements; a similar phenomenon could be found with *Light Weight* for other members of the movement certification group.

The similarity in *Strong Weight* assessments could also be attributed to the multiplicity of roles that *Weight* can play within the LMA system. *Active Weight* is the type of *Weight* I assessed in my research, but the system includes two other types of *Weight*: *Passive Weight* and *Weight Sensing*. *Passive Weight*, which includes bipolar *Elements* of *Limp* and *Heavy* is related to the sensation of “letting gravity be the active force, surrendering” one’s body mass (Hackney, 2002, p. 220). *Weight Sensing* can simply be described as quickly shifting between *Passive* and *Active Weight*. A typical use of *Weight Sensing* is baseball players in the outfield shifting their weight from right foot to left while they wait for the batter to hit the ball. The layered nature of the *Weight Factor*, and its connection to how people are engaging with their body mass at any

moment, may have blurred the lines of what looked like *Active Strong Weight* and what may have been more accurately perceived by Laban participants as *Passive Heavy Weight* or *Weight Sensing*.

To facilitate the instruction of the concept of *Weight*, James Jordan chooses to evade the three-pronged definition of *Weight* and instead focuses *Weight* instruction on the acquisition of movement experiences that specifically support *Active Strong Weight*. In addition to developing a series of movement exercises intended to teach the embodiment of *Strong Weight* as a part of their general movements, he describes beginning with a *Weight*-neutral conducting pattern and incrementally adding *Weight* to integrate it into conducting gesture (Jordan, Wyers, & Andrews, 2011). Upon first reading this approach I thought it was too reductive, but in the context of my research it makes more sense: if *Strong Weight* scores were equal across both groups, then perhaps Laban conductors tend to struggle with the acquisition and perception of *Strong Weight* within conducting gesture. Jordan's focus on *Strong Weight* as the most evasive concept within the *Weight Factor* could increase motor expertise, and subsequently could improve accuracy across the category with a different group of Laban participants or Laban-trained stimuli conductors.

My attention was also drawn to the difference in accuracy scores between the Novice and Laban groups for *Direct Space*, since the Laban group did identify *Direct Space* with 68% accuracy, the highest accuracy rating for any of the four *Space* ratings. Perhaps *Direct Space* could be more accurately identified with additional training? Or, perhaps *Direct Space* was just easier for stimuli conductors to depict than its counterpart, *Indirect Space*. If motor expertise improves visual perception, as previous research suggests (Neidlinger, 2003; Wöllner & Cañal-Bruland, 2010) then it is through *Direct Space* that Laban conductors demonstrate that

advantage. Among each of the *Effort Factors*, movement training played a notable role. Laban himself valued movement expertise above all other types, describing our body as “the mirror through which we become aware of ever-circling motion in the universe” (Laban, 2011a, p. 26). It is promising for the use of LMA that research is affirming the value Laban placed on movement-based expertise, and that to some degree people have a useful baseline of movement expertise.

5.1.3 *Configurations of Action Drive*

Applying Laban Movement Analysis to conducting instruction often results in teaching the *Effort* category by focusing on specific configurations of *Action Drive* – *Dab*, *Flick*, *Slash*, *Punch*, *Press*, *Wring*, *Float*, and *Glide*. Each of the six *Effort Elements* is normally executed through the course of instruction, but solidifying these eight combinations into communicative moments is always the goal. The Laban group scored 70% or above on all configurations of *Action Drive*. The Novice group scored above 70% accuracy on *Dab* (74%), *Punch* (90%), and *Float* (84%).

The specific configurations most accurately perceived by both groups align with the part of LMA’s theoretical framework that places those three *Effort Elements* in the same category. Because of the maximal accuracy of *Punch* and *Float*, I will be concentrating on contextualizing the meaning of those results within the system. *Punch* includes the *Effort Elements* of *Quick Time*, *Strong Weight*, and *Direct Space*, while *Float* includes *Sustained Time*, *Light Weight*, and *Indirect Space*. The maximal accuracy of these two configurations is particularly interesting because the combination of these two *Action Drives* contains the entire spectrum of *Effort Elements*. Additionally, the *Effort Elements* that create *Punch* are all labeled as *Condensing* or *Fighting* gestures, while the *Effort Elements* that create *Float* are all labeled as *Expanding* or

Indulging gestures (Bradley, 2009). A cubic representation of each *Action Drive* configuration and the six *Effort Elements* used within those configurations is shown below (Figure 5.1).

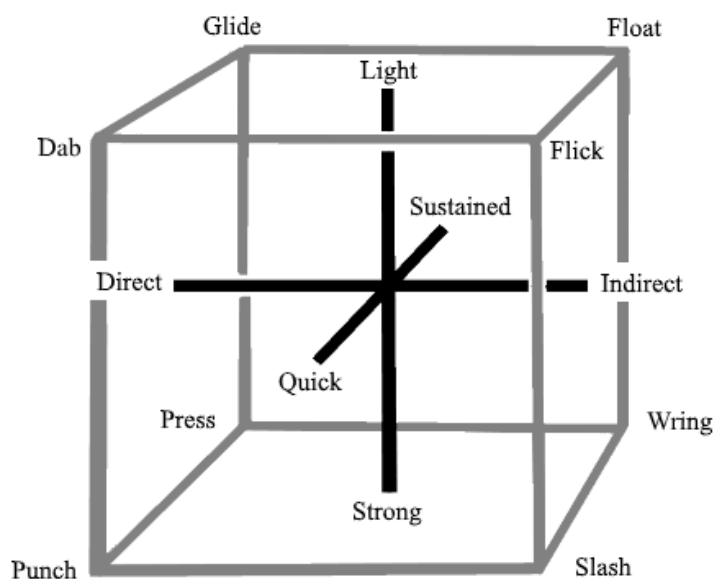


Figure 5.1 Laban *Effort* cubic representation

The *Condensing* part of the *Effort* representation includes qualities that contain and direct energy in a manner that could be used for physical fighting. The label of the three *Effort Elements* as *Punch* is certainly indicative of the gesture quality they evoke. Figure 5.2 isolates the *Condensing* qualities by slicing the cubic *Effort* representation in half and labeling only the *Effort Elements* in that *Condensing* half of the cube.

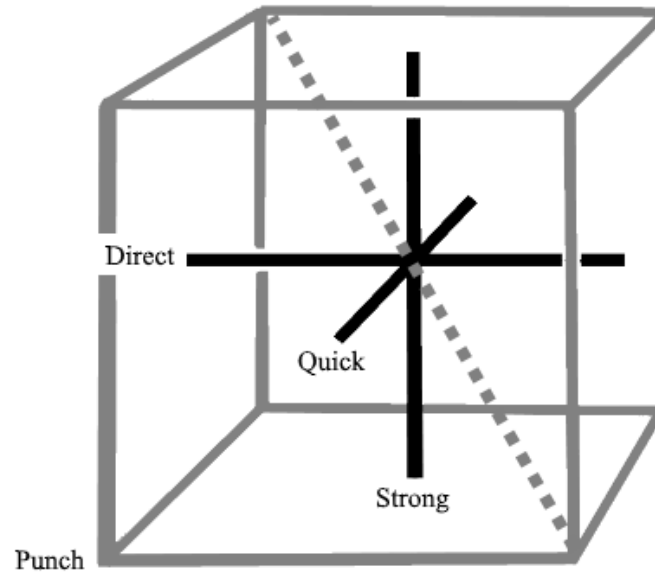


Figure 5.2 *Condensing Elements* cubic representation

Expanding Elements are the equal and opposite reaction to fighting. If one can imagine a cartoonish response after getting punched where the victim flies into the air defying gravity, bending time, and moving toward no specific destination, then that would be an example of *Float*. Someone wandering delicately around a museum with the freedom to linger may be engaging with the *Expanding Elements* of the *Effort* representation as well. Figure 5.3 isolates only *Expanding* qualities by slicing the cubic *Effort* representation in half and labeling only the *Effort Elements* in that half of the cube.

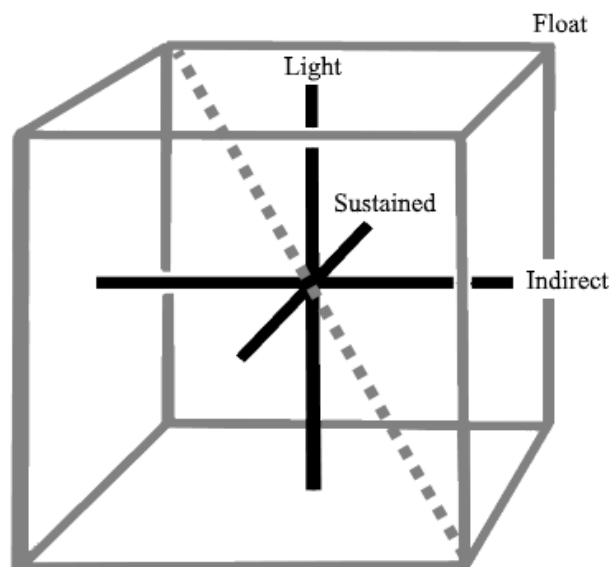


Figure 5.3 *Expanding Elements* cubic representation

The synergistic effect of some *Effort Element* combinations aligned with the relationships that Laban himself noticed during the creation of the system and the results found here for *Punch* and *Float*. At minimum, these results could indicate that teaching the *Space Factor* in combination with other specific *Elements* is more useful than in other combinations or in isolation. At most, it could highlight the difficulty of defining the *Space Factor* outside of limited synergistic configurations of *Action Drive*.

5.2 LIMITATIONS AND CONFOUNDS

5.2.1 *Space Factor: Crucial Finding or Limitation?*

Participants identified both *Time* and *Weight Factors* with accuracy consistently beyond chance, while they identified the *Space* category at or near the level of chance. I believe it is significant that the category of *Space* appears to have been problematic for both participant groups, with Laban conductors only showing significantly greater accuracy for *Direct Space* (Novice, 54%; Laban, 68%). This section offers potential reasons for this discrepancy, but it is

important to consider the logic of this finding as it stands. The *Space Factor*'s connectivity to both other people and the environment is rooted in its complexity. Reasons presented for the possible source of inaccuracy include: the definition of *the Space Factor*, the unclear language used when describing this *Factor* and its *Direct* and *Indirect Elements*, the construction of the video examples, and the blurred boundaries between the *Space Factor* and Laban's larger *Space* category. Put most simply, perhaps the categorical difference in accuracy is due to the personal nature of participant's interactions with others and their environment. These aforementioned complexities, the difference in accuracy scores, and the minimal impact of training upon those scores reinforces that *Space* is somehow different than *Time* and *Weight*.

The groups' low accuracy ratings for *Space* (Novice, 50%; Laban, 59%) indicated either that all people may not accurately perceive the *Space Factor*, or that the construction of the stimuli for *Space* was not valid. Conducting video construction may have influenced the low accuracy ratings by both participant groups. The video examples included only the conductor in the frame; while this was useful for keeping focus on the conductor, it may have blurred the focus, or *Space Factor*, of each example. Since the construction of the *Space Factor* requires subjects to interact with another person, group of people, or their environment, limiting the viewing area to only the subject may have been problematic. To test the validity of this amendment, new videos would need to be created to include a small choir. The camera would still be positioned in front of the conductor, but the presence of other people in the video as well could give more information to participants about the nature of the conductor's focus in each example.

Another complicating factor for interpreting the *Space Factor* may have been the degree to which gesture rebound, eye contact, and the torso each play a role in its perception. Though

Direct and *Indirect Space* can be identified without eye contact, it is frequently eye contact that is used to determine focus even among Certified Laban/Bartenieff Movement Analysts. It is also possible that the mere presence of a choir on camera would better guide the stimulus conductor to maintain consistent focus throughout the example, which could improve accuracy ratings. Abernathy and Zawi (2007) found that the accuracy of nonexperts increased as the length of visual information in their stimuli increased. Having more visual information in the form of potential areas of gesture focus could have increased accuracy in my study, just as having longer sequences of racket stroke improved predictions of object trajectory for non-motor experts for Abernathy and Zawi (2007).

Most simply, it could be that the Laban vocabulary of *Direct* and *Indirect* is unclear, and perhaps a less frequently used alternative, such as *Focused* and *Diffuse*, may be clearer. An investigation into the clarity of alternate *Space Factor* vocabulary could provide the missing link for introducing Laban Movement Analysis concepts with greater accuracy. Regardless of the presence or absence of an ensemble, it may be that the four stimuli conductors had an inconsistent understanding or execution of *Space* and that impacted participant ratings. Or, perhaps it was within the *Space Factor* where movement signatures were the most pronounced. Based upon the accuracy ratings for the four stimuli conductors, each conductor would have had to struggle with the *Space Factor* to a similar degree for this explanation to be credible. This explanation seems unlikely to me, but because of the complexity of the LMA system, it is possible.

The Laban framework itself may be the confounding variable preventing consistent perception of the *Space Factor*. Any of the previously discussed amendments could be necessary due to the requirement of an object of focus for the clear communication of intent. With other

Effort Factors, such as *Weight* and *Time*, the only variations involve tending to one's own body mass or one's personal perceptions of urgency to a physical task. None of these gesture qualities rely as heavily on the relationship with the environment and other people as does the accurate portrayal and perception of the *Space Factor*. Another level of complication involves the sometimes-overlapping relationship of Laban's *Space Effort Factor* and his larger category of *Space*. "In LMA description, the emphasis is on identifying the movement elements that contribute to our perceptions of the mover's inner attitude toward his/her spatial movement" (Groff, 1990, p. 135). If all movements create a relationship between the body, the mover's intent, and the surrounding space, it is easy to see how any specific concepts relating to the use of the *Space Factor* could be hard to define within the system. Because of this overlap, it is possible that no video stimuli alterations could accurately capture *Space*. The overlapping qualities of the *Space Effort Factor* with the category of *Space* highlights the imprecise nature of this part of Laban Movement Analysis. Without further research addressing some of these confounds, it is impossible to know whether the chasm between *Space* scores and those of *Time* and *Weight* is due to limitations of this study, or to inherent vagueness of the *Space Factor* within LMA. "Space is a hidden feature of movement and movement is a visible aspect of space" (Laban, 2011a, p. 4).

5.2.2 *Stimuli Conductors*

During the construction of the stimuli videos, I made no attempt to homogenize conducting gestures among conductors. I mandated each specific *Action Drive* configuration, but otherwise all conductors presented their own expressive interpretations. Each conducting video was selected through a process of ratings by expert Laban-trained conductors, intended to make

all videos equivalent. The results supported this objective, as Figure 4.5 displayed no dramatic differences among the four stimuli conductors; given Conductor C's comparative similarity in scores (Novice, 73%; Laban, 78%), it may be that Conductors A, B, and D had subtler expressive gestures that were more perceptible to Laban experts. Previous research supports my general finding that the Laban group was better at perceiving expressive conducting gesture than non-motor experts (Neidlinger, 2003; Wöllner & Cañal-Bruland, 2010), so there could have been some expressive information that Laban conductors saw particularly from Conductor B (Novice, 74%; Laban, 86%) that would not have been helpful to the Novice group. Hypothetically, Conductor C offering simpler expressive content than Conductor B would explain higher Laban group ratings for Conductor B. Because the differences in ratings were small, it seems clear that Novices perceive some expressive information from the visual task. Because there was minimal difference among the accuracy ratings of the four conductors, whatever differences existed did not significantly alter the results.

In my personal experience becoming a Certified Laban/Bartenieff Movement Analyst, creating an expressive movement palette inclusive of all *Effort* configurations proved to be challenging. Each of the 11 people in my certification class had an easy time with some portions of the *Effort* category, while learning to craft new ways of movement to embody other *Effort* configurations within the system. Two of the three expert Laban-trained conductors rating these videos for inclusion in the study also expressed their concern to me over some of these differences, particularly with the demonstration of *Strong Weight*. If stimuli conductors were presenting *Strong Weight* in a way that was not translating as freely from the body to the video camera, this could explain why the Novice group rated this *Effort Element* with 84% accuracy, while the Laban group rated *Strong Weight* with only 83% accuracy. If the Laban group were

looking for some specific visual cue to indicate the use of *Strong Weight* and they were not seeing that cue, that may have skewed their judgement. With the same examples, the Novice group would have come in with no prior expectations for proper indication of *Strong Weight* in the video example.

As all stimuli conductors presented their own gestural interpretations, the movement qualities identified in the video were not inclusive of all expressive qualities. All movers, and thus all conductors, have their own style of movement, or movement signature, within the system of Laban Movement Analysis; this movement signature is a set of qualities used frequently and easefully by an individual, and it is from this baseline that other types of expressive or alternative gestures spring (Billingham, 2009). All movers have some *Effort Factor* combinations that come very naturally to them, while they may have to work harder to accomplish other *Effort Factor* combinations. Some of this variety can be seen by looking at the ratings of specific *Action Drive* configurations for individual conductors using the raw data in Appendix C; one conductor may have scored very well on a *Dab*, while another conductor may have received highest accuracy ratings for a *Glide*. These small variations are certainly interesting, because they speak to the individuality that is always present even when seeking similar outcomes. While I agreed with the expert raters that some configurations were outside the movement signature for each conductor, all eight examples were still included without amendment for each conductor, as they represented the most accurate version of the *Action Drive* configuration possible for that person. It seems that the variety of movement signatures among Conductors A, B, C, and D compressed any individual differences, and these differences may well have been a strength of this study.

5.2.3 *Response Type*

One feature of the responses that may have contributed to greater consensus among both Novice and Laban groups was the use of forced choice. The semantic differential scale formatting of the response sheet provided a sliding scale reflective of degrees of agreement, while collapsing the data into binary responses for analysis allowed me to directly assess the question of categorical agreement. Forced choice not only worked well for addressing the simple question of agreement, but also may have provided a false sense of security for participants that did not feel particularly confident in their responses; in contrast, it may have caused opinionated respondents to feel limited by the format. By using a 6-point differential scale, I offered a variety of choices, and collapsing those responses into correct/incorrect allowed me to focus on the target issue of agreement. However, the information provided by the response profiles depicted in Figures 4.2, 4.3, and 4.4, elaborates on either how confident participants were in their responses, or to what degree they agreed that the example depicted any given *Effort Element*. Either or both of these motivations could have been part of the participants' thinking throughout the study, with each question offering small differences for the participants. Because I did not inquire why each participant picked the specific point on the differential scale, the different response profiles only demonstrate that the collective feedback of the two groups – Novice and Laban – were slightly different even when they agreed about the accuracy of the video examples.

If participants had been asked to freely respond, rather than being offered only the six limited choices of the semantic differential scale, then variation in responses would have made analyzing the data much more complicated. Laban Movement Analysis lends itself to richer dialogue through open choice and descriptions drawn from all four of Laban's categories – *Body*, *Effort*, *Shape*, and *Space*; however, empirical inquiry becomes challenging under these same

circumstances. Most importantly, forced choice was the only option likely to have been successful with the Novice group, since they did not understand Laban Movement Analysis going into the study. With an eye toward simpler analysis and greater probability of consensus, I followed the example of Broughton and Stevens (2012) with the use of novice opinions and simplified vocabulary, rather than relying on an open framework better suited for Laban-trained experts as in Gambetta (2005).

5.3 PARADIGM FOR MAXIMIZING CLEAR COMMUNICATION

Previously, I described *Action Drive* configuration as typical to conducting instruction. Because all configurations of *Action Drive* include the *Space Factor*, it may be prudent to first master the *Effort* combinations that do not include this unreliably perceived *Factor*. In any *Drive* configuration, three *Effort Elements* are combined in a single gesture. In Laban Movement Analysis, a *State* refers to a combination of two *Effort Elements*. For clear nonverbal communication with choristers, conductors should focus on using Laban's *Rhythm State*. *Rhythm State* is the combination of *Time* and *Weight Factors*, and includes four configurations – *Quick Time* and *Light Weight*, *Quick Time* and *Strong Weight*, *Sustained Time* and *Strong Weight*, and *Sustained Time* and *Light Weight*. In *Mastery of Movement* (2011b), Laban described *Time* and *Weight* fluctuations as being particularly useful for depicting musical emphasis. It seems appropriate that musicians would clearly understand the *Effort Factors* of *Time* and *Weight*, potentially presenting a consistent relationship between the qualities of the movement and the qualities of the music. I am isolating the *Factors* of *Time* and *Weight*, or *Rhythm State*, because they both reflected accuracy scores that an educator would find acceptable on a typical exam, and well above the 70% threshold set by previous conducting research addressing gesture

accuracy (Sousa, 1988; Cohen, 1998). The accuracy scores for *Time* and *Weight* are in Figure 5.4.

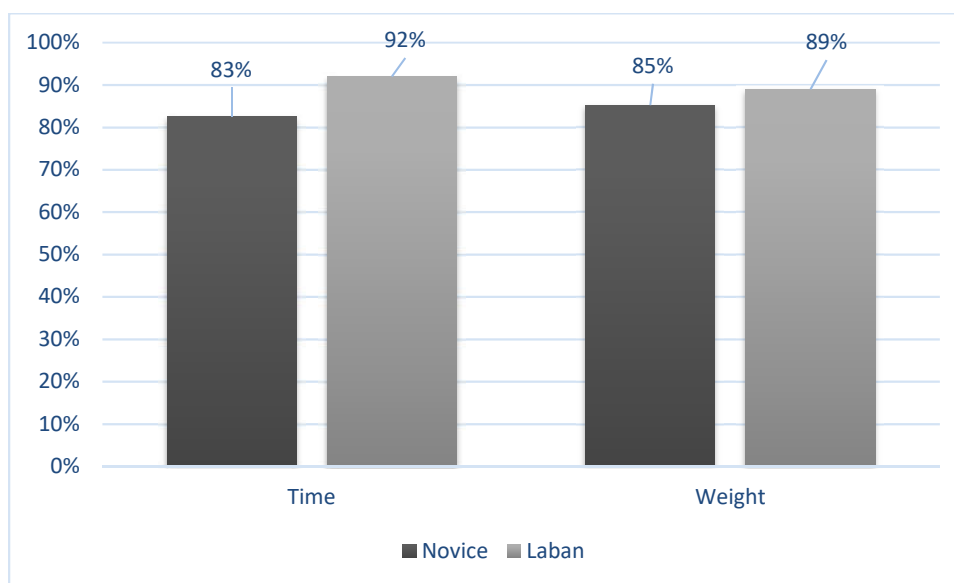


Figure 5.4 Accuracy for *Time* and *Weight* Effort Factors

Unlike the eight configurations of *Action Drive* - *Dab*, *Flick*, *Slash*, *Punch*, *Press*, *Wring*, *Float*, and *Glide* – *Rhythm State* configurations do not have names within the Laban Movement Analysis system. I labeled each configuration by the two *Effort Elements* each held: *Quick-Light*, *Quick-Strong*, *Sustained-Strong*, and *Sustained-Light*. To address whether there are combinations of these *Rhythm States* that are meaningful, I analyzed only the responses from the *Time* and *Weight* Sections – Section One and Section Two, questions 1 through 64 of the original 96 total responses – and collapsed all examples with identical *Time* and *Weight* configurations for analysis. Table 5.1 lays out the original *Action Drive* configurations that fall within each *Rhythm State* configuration. Since there are only four configurations of *Rhythm State*, and eight configurations of *Action Drive*, video examples from two configurations of *Action Drive* were analyzed within each configuration of *Rhythm State*.

Table 5.1 Video examples used in *Rhythm State* analysis

<i>Rhythm State</i>	Video Examples
<i>Quick-Light</i>	<i>Dab</i>
<i>Quick-Light</i>	<i>Flick</i>
<i>Quick-Strong</i>	<i>Slash</i>
<i>Quick-Strong</i>	<i>Punch</i>
<i>Sustained-Strong</i>	<i>Press</i>
<i>Sustained-Strong</i>	<i>Wring</i>
<i>Sustained-Light</i>	<i>Float</i>
<i>Sustained-Light</i>	<i>Glide</i>

When calculating accuracy scores for configurations of *Rhythm State*, Novices labeled conducting examples with 70% accuracy for *Rhythm State Quick-Light*, while Laban conductors labeled the same category with 95% accuracy. Though this was the single largest difference between Novice and Laban accuracy, the remainder of the scores also indicated a lopsided understanding of *Rhythm States* as seen in Figure 5.5. I used tests of independence to examine whether there was a relationship between frequency of correct/incorrect responses and group membership. Using a Bonferroni corrected alpha level of $\alpha = .006$, there was a significant relationship between response and group for *Quick-Light* [$\chi^2(1, n = 704) = 32.66, p < .006$], *Sustained-Strong* [$\chi^2(1, n = 704) = 21.35, p < .006$], and *Sustained-Light* [$\chi^2(1, n = 688) = 7.89, p < .006$]. There was no difference by group membership for the *Quick-Strong* configuration of *Rhythm State*. I also compared the frequency of correct and incorrect responses for each group for each of the four *Rhythm State* configurations; response results of goodness of fit tests are presented in Table 5.2.

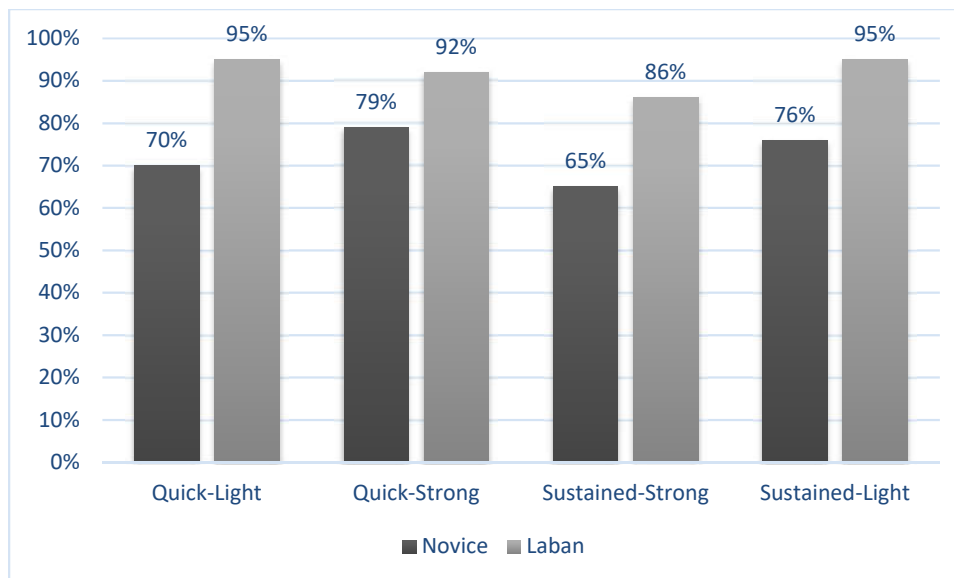


Figure 5.5 Accuracy for *Rhythm State* configurations

Table 5.2 Chi-square test results by *Rhythm State* configuration

<i>Rhythm State</i>	Correct	Incorrect	Chi-square
<i>Quick-Light</i>			
Novice	275	61	136.30 *
Laban	351	17	303.14 *
<i>Quick-Strong</i>			
Novice	294	26	224.45 *
Laban	354	30	273.38 *
<i>Sustained-Strong</i>			
Novice	232	88	64.80 *
Laban	332	52	204.17 *
<i>Sustained-Light</i>			
Novice	285	35	195.31 *
Laban	349	19	295.92 *

* $p < .006$ (Bonferroni correction)

While both groups rated all configurations of *Rhythm State* more accurately than chance, it is interesting to note the high level of accuracy for *Quick-Strong* and *Sustained-Light Rhythm State* configurations in both Novice and Laban groups. These combinations align well with specific types of musical expression, and the types of movements that people make when moving to music (Maes et al., 2014). Previous research linking movement to music meaning offered a

clear picture for *Time* and *Weight Factors*, and a varied picture for integration of the *Space Factor*. Heroic music specifically motivated participants to move with *Strong Weight* and *Quick Time*, but featured both *Direct* and *Indirect Space*. Lyric music motivated participants to use *Light Weight* and *Sustained Time*, and again both *Direct* and *Indirect Space*. For Maes et al. (2014) *Time* and *Weight Factors* were meaningful across the participant groups with varied experience, and the *Space Factor* proved to be more personalized in its relationship to movement and the music. Perhaps this personalization offers additional insight into the nature of the *Space Factor*, and the uniformity of responses in *Time* and *Weight Factors* bolster this research and my suggestion to concentrate on configurations of *Rhythm State* to facilitate conducting gesture communication.

5.4 CONCLUSIONS AND FUTURE RESEARCH

Laban-based conducting training was the most consistent predictor of increased accuracy when viewing *Effort* qualities in conducting videos. However, even Laban-based conducting training did not produce acceptably accurate ratings of *Space* videos. It was unclear whether the inaccuracy with the *Space Factor* was the result of invalid testing stimuli, a shortcoming in the application of Laban Movement Analysis to conducting, a uniform inconsistency in demonstrating *Space* on the part of the conductors, or simply something unidentified through this research that makes the *Space Factor* different. The *Effort* category appears to be a clear framework for understanding differences in conducting gesture qualities, as least as far as they related to factors of *Time* and *Weight* on a forced choice response sheet. Though training was important for accuracy, only further research could identify whether it was Laban-based conducting training, general LMA instruction, or content area expertise as a conductor that

provided this accuracy advantage. I speculated that a more limited Laban-based gestural palette could aid in the non-verbal communication between conductor and chorister. Those limitations included the use of the *Space Factor* only as a component of the *Action Drive* configurations that were reliably accurate by both participant groups: *Punch* and *Float*. This approach would introduce the combination of three of Laban's *Condensing Elements* (*Quick Time, Strong Weight, Direct Space*), in stark contrast to three of Laban's *Expanding Elements* (*Sustained Time, Light Weight, Indirect Space*). Providing only these two highly contrasting options would severely limit the portrayal of nuanced musical emphases, but could function as an entry point into dramatic expressive content. A broader approach would be focusing on the four configurations of *Rhythm State*, since this eliminates the inconsistency of the *Space Factor* and aligns with the use of *Time* and *Weight Factors* as a mechanism for creating emphasis (Laban, 2011b). Because these gestures could be used to convey varied onsets, accents, and consonant-driven endings, mastery of *Rhythm State* could be very useful for delivering clear expressive content to choristers through gestures. Until researchers empirically evaluate the *Flow Factor*, re-evaluate the *Space Factor*, and study the other three categories of Laban Movement Analysis, the options outlined above are the most conservative approach for facilitating clear, communicative conducting.

Ultimately, I wanted to understand how conducting gestures impacted student performance, but first needed a system from which to describe consistently perceptible gesture qualities. I sought to address this preliminary issue by limiting the scope of the study to chorister perceptions of Laban-based conducting gesture. By tackling what ensemble members saw and understood, going forward, one might be able to study the influence of those Laban-based perceptions upon the music. To test the strength of my proposed paradigm, future *Rhythm State-*

centered research should address the impact of *Time* and *Weight* on music making, including vocal responses, which could then be rated for expressiveness or connection to musical accents and style markings. It may be possible to test the impact of *Rhythm State* conducting gestures on the quality or duration of vocal onset, the amplitude of the sound, or the degree of vocal tension (Fuelberth, 2003, 2001). The production-based continuation of my research could proceed with participants singing “Alouette,” as it was the model for my stimuli conductors, or any other equally flexible and familiar tune. Because choristers not only perceive conducting gestures, but also must respond vocally based upon those perceptions, taking this next step to assess the impact of gesture upon vocal production is essential for the musical application of these perceptions in rehearsal and performance.

Future research along this line of inquiry could continue to assess the *Space Factor* by changing the environment surrounding the conductor and testing its impact upon accuracy scores to see if there is a setting where it also can be perceived accurately. A deeper investigation into the *Space Factor* might necessitate an examination into the potential overlap or relationship of *Space* as an *Effort Factor* with *Space* as a category. Another interesting continuation of this study could analyze rating differences between Laban-trained conductors and expert conductors with no Laban training, to determine if one type of expertise – conducting or Laban Movement Analysis – accounts for the greater difference in accuracy ratings. Future research related within the *Effort* category should investigate the *Flow Factor*, which was not analyzed during this study. Because *Flow* is the baseline of human movement (Hackney, 2002), and is therefore always present (Billingham, 2009), it may be prudent to study this *Factor* in isolation before combining it with other *Effort Elements*. Research studying the potential communicative power of the other three categories of Laban Movement Analysis—*Body*, *Shape*, and *Space*—would

offer a more comprehensive understanding of incorporating Laban Movement Analysis into conducting. Though conductors use these categories less frequently, they are rich for broadening one's expressive conducting palette.

The long-term goal of this research was to begin to decode exactly what singers can process in conducting gesture during a rehearsal. This information could allow a conductor to choose gestures that are immediately meaningful. As a contribution to the choral conducting and music education fields, continuing this investigation and applying the findings to conducting instruction could influence a new generation of young conductors and thus also influence their many singers. Rather than interpreting these findings as a set of expressive restrictions, empirically supported gestures could serve as an entry point for truly communicative expressivity between conductors and their choirs.

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APPENDIX A: HUMAN SUBJECTS DIVISION APPROVAL



UNIVERSITY of WASHINGTON
HUMAN SUBJECTS DIVISION

Date: March 18, 2015

PI: Ms. Amanda Huntleigh, Graduate Student, School of Music
RE: HSD study #49277
"Evaluating Conducting Gesture: Examining Visual Perceptions of Choral Singers and Laban-Trained Choral Conductors"

Dear Ms. Huntleigh:

The University of Washington Human Subjects Division (HSD) has determined that your research qualifies for exempt status in accordance with the federal regulations under 45 CFR 46.101/ 21 CFR 56.104. Details of this determination are as follows:

Exempt category determination: 2

Determination period: **March 18, 2015 to March 17, 2020**

Although research that qualifies for exempt status is not governed by federal requirements for research involving human subjects, investigators still have a responsibility to protect the rights and welfare of their subjects, and are expected to conduct their research in accordance with the ethical principles of *Justice, Beneficence* and *Respect for Persons*, as described in the Belmont Report, as well as with state and local institutional policy.

Determination Period: An exempt determination is valid for five years from the date of the determination, as long as the nature of the research activity remains the same. If there is any substantive change to the activity that has determined to be exempt, one that alters the overall design, procedures, or risk/benefit ratio to subjects, the exempt determination will no longer be valid.

Exempt determinations expire automatically at the end of the five-year period. If you complete your project before the end of the determination period, it is not necessary to make a formal request that your study be closed. Should you need to continue your research activity beyond the five-year determination period, you will need to submit a new *Exempt Status Request* form for review and determination *prior to implementation*.

Revisions: Only modifications that are deemed "minor" are allowable, in other words, modifications that do not change the nature of the research and therefore do not affect the validity of the exempt determination. **Please refer to the [SOP on Exempt Determinations](#) for more information about what are considered minor changes.** If changes that are considered to be "substantive" occur to the research, that is, changes that alter the nature of the research and therefore affect the validity of the exempt determination, a new *Exempt Status Request* must be submitted to HSD for review and determination *prior to implementation*.

Problems: If issues should arise during the conduct of the research, such as unanticipated problems, adverse events or any problem that may increase the risk to the human subjects and change the category of review, notify HSD promptly. Any complaints from subjects pertaining to the risk and benefits of the research must be reported to HSD.

Please use the HSD study number listed above on any forms submitted which relate to this research, or on any correspondence with the HSD office.

If we can be of further assistance, please contact us at (206) 543-0098 or via email at hsdinfo@uw.edu.

Sincerely,

Marcia Engstrom
Review Coordinator | IRB Subcommittee EG
(206) 685-8341
mabe@uw.edu

4333 Brooklyn Ave. NE, Box 359470 Seattle, WA 98195-9470

main 206.543.0098 fax 206.543.9218 hsdinfo@uw.edu www.washington.edu/research/hsd

APPENDIX B: PARTICIPANT RESPONSE FORMS

Dissertation Research Consent Form*

I, _____, understand that participating in this research study is completely voluntary and that the researcher has collected no information to connect my responses to my identity. By signing, I allow Amanda Huntleigh to use information collected for research purposes and to analyze this data in conjunction with other participations for the purpose of her dissertation and use in related research publications.

(Signature)

(Date)

* This form was collected and stored separately from individual *Music & Movement Background Survey* and differential scale response forms.



MUSIC & MOVEMENT BACKGROUND SURVEY



Please complete the following demographic questions.

Age

- 18-24
- 25-34
- 35-44
- 45-54
- 55+

Gender

- Female
- Male
- Non-conforming

Education Completed

- High School/GED
- Undergraduate Degree
- Graduate Degree

For the movement background section, *please check all that apply*

Movement Education

- Studio Dance Classes
- Private Dance Instruction
- Ballroom/Swing/etc. Classes
- Laban-based Dance Instruction
- Bachelor's Degree in Dance
- Graduate Certificate in Dance
- Graduate Degree in Dance

Movement Participation

- Show Choir
- Marching Band
- Music Theater Productions
- Dance Team
- Other (please specify)

**MUSIC & MOVEMENT BACKGROUND SURVEY continued**

For the music background section, ***please check all that apply***

Music Participation

- High School Choir
- High School Band
- High School Orchestra
- University Choral Ensemble
- University Instrumental Ensemble
- Student-run Vocal Groups
- Student-run Chamber Ensembles
- Other University Experience

(Please specify)

Music Education

- Piano Lessons
- Voice Lessons
- Other Instrumental Lessons
- Private Conducting Instruction
- Undergraduate Conducting Class
- Graduate Conducting Class
- Bachelor's Degree in Music
- Graduate Certificate in Music
- Graduate Degree in Music

Was any of your conducting instruction Laban-based?

- No
- Yes

If yes, please check the boxes that best describe your experience

- Beginning Undergraduate Conducting Class
- Intermediate Undergraduate Conducting
- Graduate Conducting
- Private Conducting Lessons

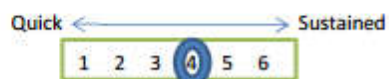


Directions

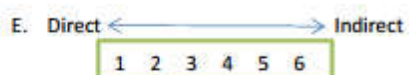
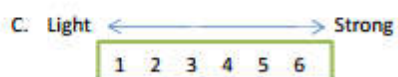
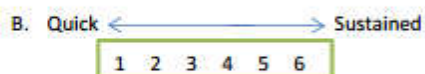
Please circle the most appropriate rating on each answer scale.

For example, if you think that an example looks consistently and convincingly sustained, you might choose a score of 6. However, if it were consistently and convincingly quick, you might choose a score of 1. If you think the example falls somewhere in between those two extremes, the score should fall more toward the middle of the scale. You are selecting the score that is most representative of how you perceive the entire example.

Example



PRACTICE QUESTIONS





SECTION ONE

1. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

2. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

3. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

4. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

5. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

6. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

7. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

8. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

9. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

10. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

11. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

12. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

13. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

14. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

15. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

16. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

17. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

18. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

19. Quick \longleftrightarrow Sustained
1 2 3 4 5 6

20. Quick \longleftrightarrow Sustained
1 2 3 4 5 6



SECTION ONE continued

21. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

22. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

23. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

24. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

25. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

26. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

27. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

28. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

29. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

30. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

31. Quick \longleftrightarrow Sustained

1 2 3 4 5 6

32. Quick \longleftrightarrow Sustained

1 2 3 4 5 6



SECTION TWO



33. Light \longleftrightarrow Strong
1 2 3 4 5 6

43. Light \longleftrightarrow Strong
1 2 3 4 5 6

34. Light \longleftrightarrow Strong
1 2 3 4 5 6

44. Light \longleftrightarrow Strong
1 2 3 4 5 6

35. Light \longleftrightarrow Strong
1 2 3 4 5 6

45. Light \longleftrightarrow Strong
1 2 3 4 5 6

36. Light \longleftrightarrow Strong
1 2 3 4 5 6

46. Light \longleftrightarrow Strong
1 2 3 4 5 6

37. Light \longleftrightarrow Strong
1 2 3 4 5 6

47. Light \longleftrightarrow Strong
1 2 3 4 5 6

38. Light \longleftrightarrow Strong
1 2 3 4 5 6

48. Light \longleftrightarrow Strong
1 2 3 4 5 6

39. Light \longleftrightarrow Strong
1 2 3 4 5 6

49. Light \longleftrightarrow Strong
1 2 3 4 5 6

40. Light \longleftrightarrow Strong
1 2 3 4 5 6

50. Light \longleftrightarrow Strong
1 2 3 4 5 6

41. Light \longleftrightarrow Strong
1 2 3 4 5 6

51. Light \longleftrightarrow Strong
1 2 3 4 5 6

42. Light \longleftrightarrow Strong
1 2 3 4 5 6

52. Light \longleftrightarrow Strong
1 2 3 4 5 6



SECTION TWO continued

53. Light \longleftrightarrow Strong
1 2 3 4 5 6

63. Light \longleftrightarrow Strong
1 2 3 4 5 6

54. Light \longleftrightarrow Strong
1 2 3 4 5 6

64. Light \longleftrightarrow Strong
1 2 3 4 5 6

55. Light \longleftrightarrow Strong
1 2 3 4 5 6

56. Light \longleftrightarrow Strong
1 2 3 4 5 6

57. Light \longleftrightarrow Strong
1 2 3 4 5 6

58. Light \longleftrightarrow Strong
1 2 3 4 5 6

59. Light \longleftrightarrow Strong
1 2 3 4 5 6

60. Light \longleftrightarrow Strong
1 2 3 4 5 6

61. Light \longleftrightarrow Strong
1 2 3 4 5 6

62. Light \longleftrightarrow Strong
1 2 3 4 5 6



SECTION THREE



65. Direct \longleftrightarrow Indirect

75. Direct \longleftrightarrow Indirect

66. Direct \longleftrightarrow Indirect

76. Direct \longleftrightarrow Indirect

67. Direct \longleftrightarrow Indirect

77. Direct \longleftrightarrow Indirect

68. Direct \longleftrightarrow Indirect

78. Direct \longleftrightarrow Indirect

69. Direct \longleftrightarrow Indirect

79. Direct \longleftrightarrow Indirect

70. Direct \longleftrightarrow Indirect

80. Direct \longleftrightarrow Indirect

71. Direct \longleftrightarrow Indirect

81. Direct \longleftrightarrow Indirect

72. Direct \longleftrightarrow Indirect

82. Direct \longleftrightarrow Indirect

73. Direct \longleftrightarrow Indirect

83. Direct \longleftrightarrow Indirect

74. Direct \longleftrightarrow Indirect

84. Direct \longleftrightarrow Indirect



SECTION THREE continued

85. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

95. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

86. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

96. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

87. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

88. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

89. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

90. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

91. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

92. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

93. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

94. Direct \longleftrightarrow Indirect
1 2 3 4 5 6

APPENDIX C: RAW DATA

Novice Participants, Semantic Differential Scale Data: *Time Factor*

Q.	Cond.	Action Drive	Element	Participant Code (<i>n</i> = 21)																					Mean
				1	2	3	5	6	7	15	19	20	23	27	29	32	33	34	35	36	37	42	44	45	
1	C	Glide	Sust.	5	5	5	6	5	5	4	6	6	6	3	6	4	4	3	5	6	4	x	4	3	4.75
2	D	Punch	Quick	5	6	6	6	5	6	5	5	6	6	6	5	4	4	6	5	4	5	5	4	5	5.19
3	A	Dab	Quick	5	4	3	3	6	4	6	6	3	4	5	4	5	1	5	3	5	4	3	5	4	4.19
4	D	Press	Sust.	6	4	5	1	5	5	5	6	5	5	4	4	2	4	4	5	6	3	3	4	2	4.19
5	A	Float	Sust.	4	5	4	3	4	6	3	2	6	5	3	5	5	4	5	5	6	4	4	4	4	4.33
6	C	Slash	Quick	5	6	5	2	5	6	4	6	6	2	2	6	3	1	5	6	2	4	5	4	5	4.29
7	B	Glide	Sust.	6	6	6	3	6	6	5	6	5	5	5	6	6	4	5	6	6	4	5	5	5	5.29
8	C	Float	Sust.	6	6	6	6	6	3	6	5	6	5	5	5	6	5	4	6	6	5	6	6	4	5.38
9	B	Press	Sust.	3	2	3	2	4	2	2	6	3	5	4	3	4	2	3	3	6	3	3	5	2	3.33
10	A	Flick	Quick	5	5	5	4	4	6	6	5	5	5	5	5	5	3	5	5	5	4	3	5	5	4.76
11	B	Slash	Quick	5	5	6	6	6	6	5	5	5	5	5	5	4	4	4	6	4	5	6	5	5	5.10
12	C	Wring	Sust.	4	3	3	6	5	5	4	4	5	5	3	4	5	4	6	5	4	5	3	5	3	4.33
13	D	Flick	Quick	6	4	5	6	6	6	5	6	6	5	5	5	6	2	6	5	5	5	4	5	4	5.10
14	A	Press	Sust.	5	4	4	6	5	5	4	6	6	5	3	5	5	2	3	5	5	4	4	5	4	4.52
15	B	Flick	Quick	6	5	5	4	5	6	6	6	6	5	6	4	5	3	5	4	5	4	4	5	5	4.95
16	D	Glide	Sust.	5	5	5	1	6	6	6	5	6	6	5	6	5	5	5	5	6	3	6	6	5	5.14
17	B	Wring	Sust.	5	4	4	4	6	4	6	5	4	6	4	5	5	2	4	4	6	3	5	5	4	4.52
18	C	Flick	Quick	6	5	5	4	6	6	4	6	6	5	5	5	6	2	3	5	5	4	4	5	4	4.81
19	A	Glide	Sust.	6	4	4	5	4	4	5	6	4	5	4	6	4	3	3	6	5	3	4	5	3	4.43
20	C	Dab	Quick	4	2	4	3	4	5	2	3	4	5	2	3	6	3	4	3	5	2	2	2	4	3.43
21	A	Wring	Sust.	4	4	3	3	4	5	3	6	5	5	5	3	6	2	5	3	5	3	4	5	4	4.14
22	D	Dab	Quick	6	5	5	6	5	6	6	6	6	5	5	5	6	2	5	6	6	5	4	6	4	5.24
23	B	Float	Sust.	5	4	3	2	4	4	4	5	6	5	5	5	4	5	3	2	3	4	5	5	5	4.19
24	A	Slash	Quick	5	5	6	2	6	5	6	6	5	5	5	5	3	3	6	4	4	5	4	5	2	4.62
25	C	Press	Sust.	4	4	3	5	6	4	2	6	5	5	3	4	5	3	4	3	5	3	3	6	3	4.10
26	B	Punch	Quick	5	6	6	4	6	6	5	2	6	5	5	4	1	3	6	6	5	5	5	6	4	4.81
27	D	Float	Sust.	6	6	6	1	6	6	6	6	6	5	6	6	4	5	6	5	6	5	6	6	6	5.48
28	A	Punch	Quick	6	6	5	6	6	6	5	5	5	5	5	4	4	4	6	6	6	5	5	6	4	5.24
29	B	Dab	Quick	5	4	4	5	5	5	5	4	3	4	4	3	5	1	4	4	6	2	4	3	5	4.05
30	D	Slash	Quick	5	5	5	4	6	4	6	6	4	5	5	6	5	5	5	5	5	5	6	5	6	5.14
31	C	Punch	Quick	6	6	6	2	6	5	4	5	6	6	5	6	3	3	5	6	3	4	6	5	4	4.86
32	D	Wring	Sust.	4	4	3	1	4	5	2	6	4	4	4	4	2	3	5	3	6	4	5	5	4	3.90

Novice Participants, Semantic Differential Scale Data: *Weight Factor*

Q.	Cond.	Action Drive	Element	Participant Code (<i>n</i> = 21)																					Mean
				1	2	3	5	6	7	15	19	20	23	27	29	32	33	34	35	36	37	42	44	45	
33	A	Glide	Light	5	4	4	2	4	3	4	5	4	5	5	3	3	3	4	5	3	5	5	4	4	4.00
34	D	Slash	Strong	5	5	5	6	5	5	5	4	5	4	4	5	5	5	3	5	5	5	5	5	4	4.76
35	B	Punch	Strong	6	6	6	6	6	6	5	6	5	5	6	6	6	6	3	6	6	6	6	6	5	5.67
36	C	Wring	Strong	3	4	4	4	4	5	4	5	4	3	4	5	5	5	5	3	4	4	x	4	4	4.15
37	B	Float	Light	6	5	5	5	5	5	5	6	6	5	5	5	5	5	5	6	4	5	6	5	5	5.19
38	C	Dab	Light	6	6	4	6	6	6	6	6	6	5	6	6	5	4	3	5	4	5	6	6	6	5.38
39	A	Float	Light	5	6	4	6	5	4	4	5	6	5	5	4	6	5	4	4	3	4	4	5	3	4.62
40	D	Dab	Light	5	4	3	3	6	6	5	5	5	5	4	4	4	6	6	4	3	4	6	5	5	4.67
41	C	Press	Strong	4	4	4	3	4	5	4	6	5	4	4	5	5	5	4	5	5	4	4	4	4	4.38
42	B	Dab	Light	4	4	4	4	4	5	4	4	5	5	5	4	4	4	4	3	3	4	5	5	4	4.19
43	C	Slash	Strong	5	5	5	6	5	6	5	5	6	4	5	6	6	5	3	6	6	5	5	5	5	5.19
44	A	Punch	Strong	5	5	5	6	5	6	5	5	5	5	5	6	6	6	2	6	6	6	6	6	5	5.33
45	D	Glide	Light	5	6	6	6	6	6	5	6	6	5	6	5	6	5	3	6	4	6	6	6	5	5.48
46	A	Flick	Light	2	3	2	2	1	2	4	2	2	2	3	4	3	2	1	3	2	3	2	1	2	2.29
47	D	Float	Light	6	6	6	5	6	5	6	6	5	6	6	6	6	3	1	5	5	6	6	5	6	5.33
48	B	Wring	Strong	4	5	5	4	5	5	4	6	4	4	4	2	5	5	5	5	6	4	6	4	5	4.62
49	D	Punch	Strong	5	6	6	6	6	6	6	6	6	4	5	5	6	4	3	5	5	5	4	6	5	5.24
50	B	Press	Strong	3	4	4	3	4	4	4	4	4	4	3	4	5	5	3	4	4	4	4	4	4	3.90
51	A	Slash	Strong	4	5	5	5	4	4	6	3	4	5	4	5	5	3	2	5	5	5	4	5	4	4.38
52	C	Flick	Light	5	5	4	3	5	5	6	5	5	5	5	3	5	5	5	5	4	5	5	5	5	4.76
53	A	Dab	Light	5	4	5	4	6	6	6	6	6	5	5	5	5	5	5	6	4	5	6	6	6	5.29
54	D	Wring	Strong	4	5	4	3	5	4	3	5	6	4	3	3	4	6	6	4	4	4	5	5	5	4.38
55	B	Slash	Strong	6	6	6	6	6	6	6	6	6	6	5	6	6	6	4	6	5	6	6	6	5	5.76
56	A	Wring	Strong	3	3	4	3	4	3	3	5	5	3	3	5	4	4	3	3	4	4	3	4	4	3.67
57	D	Press	Strong	2	4	3	3	3	2	4	3	3	2	2	3	3	3	4	3	4	3	2	3	3	2.95
58	B	Flick	Light	5	4	5	3	6	4	3	5	5	5	5	6	4	4	5	4	3	5	5	4	4	4.48
59	A	Press	Strong	2	5	4	2	4	5	3	5	5	3	4	5	5	5	5	5	5	5	5	5	4	4.33
60	C	Glide	Light	6	6	6	5	6	5	6	5	6	6	5	5	5	5	5	6	3	5	5	5	6	5.33
61	D	Flick	Light	5	5	5	3	6	5	5	6	5	5	5	5	3	6	4	5	4	4	5	5	5	4.81
62	C	Float	Light	6	5	5	6	6	6	6	4	6	5	6	4	5	5	6	6	3	6	6	6	6	5.43
63	B	Glide	Light	6	4	4	5	4	4	6	4	5	5	5	5	3	5	4	5	4	6	5	6	4	4.71
64	C	Punch	Strong	5	6	6	6	6	6	6	6	6	4	6	5	5	5	3	6	6	6	5	6	5	5.48

Novice Participants, Semantic Differential Scale Data: *Space Factor*

Q.	Cond.	Action Drive	Element	Participant Code ($n = 21$)																				Mean	
				1	2	3	5	6	7	15	19	20	23	27	29	32	33	34	35	36	37	42	44		45
65	C	Flick	Indirect	4	2	2	4	4	2	2	4	4	2	5	2	5	5	4	2	2	3	4	4	2	3.24
66	D	Wring	Indirect	5	2	3	3	3	1	3	2	5	3	5	6	4	6	6	2	2	3	3	3	2	3.43
67	A	Flick	Indirect	2	3	3	1	3	3	6	5	2	1	2	1	4	2	1	3	4	5	5	4	4	3.05
68	B	Glide	Direct	2	3	3	1	3	2	1	2	5	2	2	3	2	6	4	1	2	3	4	2	2	2.62
69	C	Slash	Indirect	2	1	1	2	2	1	2	3	1	4	1	4	5	5	2	1	1	1	2	2	2	2.14
70	A	Dab	Direct	3	2	5	3	4	3	2	2	5	6	6	4	3	2	5	4	5	3	1	4	4	3.62
71	B	Wring	Indirect	5	4	4	3	3	2	4	3	5	2	4	2	6	3	5	5	3	3	3	4	4	3.67
72	C	Punch	Direct	5	6	6	6	5	6	5	5	6	3	6	4	5	1	4	5	6	6	5	6	6	5.10
73	D	Slash	Indirect	5	1	1	1	2	1	3	2	5	1	2	4	4	3	3	2	2	3	2	2	1	2.38
74	C	Wring	Indirect	2	3	2	2	2	1	2	2	6	6	3	2	4	1	5	6	3	2	1	4	3	2.95
75	B	Float	Indirect	6	4	5	1	4	5	3	5	5	4	4	4	6	3	3	4	3	4	2	5	4	4.00
76	D	Flick	Indirect	2	4	1	6	3	5	4	5	2	2	2	1	2	1	3	2	3	5	4	3	2	2.95
77	C	Glide	Direct	3	4	1	1	2	3	1	3	1	1	3	5	1	4	3	3	4	1	4	1	2	2.43
78	A	Slash	Indirect	2	2	1	1	4	1	2	2	2	2	1	5	5	4	4	2	1	2	5	2	2	2.48
79	D	Glide	Direct	4	3	5	3	2	1	5	4	3	5	3	5	2	5	2	3	4	4	4	1	2	3.33
80	A	Press	Direct	5	5	4	3	2	1	1	3	1	3	4	1	3	5	2	2	4	5	4	4	2	3.05
81	C	Float	Indirect	3	3	5	5	6	3	6	3	6	6	4	3	3	4	1	4	4	5	5	5	5	4.24
82	A	Wring	Indirect	4	3	4	3	5	3	4	5	5	4	3	6	5	6	6	4	4	3	4	4	4	4.24
83	B	Flick	Indirect	4	2	1	1	4	3	5	2	1	1	2	4	2	4	4	2	1	3	3	3	2	2.57
84	D	Punch	Direct	2	6	5	2	4	6	3	6	6	5	6	2	4	1	4	6	6	5	4	5	6	4.48
85	B	Press	Direct	4	3	2	2	3	6	4	5	2	4	4	5	1	5	4	3	3	4	3	3	3	3.48
86	D	Dab	Direct	6	2	5	6	3	2	2	4	6	6	6	6	5	4	4	5	5	2	3	4	5	4.33
87	A	Glide	Direct	5	2	2	4	3	4	1	3	2	3	3	5	1	5	2	3	4	3	3	2	3	3.00
88	B	Slash	Indirect	5	1	2	3	3	1	2	2	2	2	3	6	5	5	3	3	1	1	3	1	1	2.62
89	D	Press	Direct	4	3	3	1	2	1	3	6	2	4	3	2	3	4	2	5	3	4	5	2	2	3.05
90	B	Punch	Direct	3	5	6	1	4	6	4	5	6	6	6	2	6	1	5	6	5	6	3	6	6	4.67
91	D	Float	Indirect	3	6	4	2	5	6	2	5	5	5	6	3	5	4	5	6	5	4	5	6	5	4.62
92	C	Dab	Direct	1	6	4	4	2	1	1	2	4	1	3	2	4	1	5	2	3	1	4	4	2	2.71
93	A	Float	Indirect	3	5	4	1	6	4	2	6	4	5	4	3	6	6	5	3	4	5	4	5	3	4.19
94	B	Dab	Direct	3	3	6	6	5	4	1	3	5	6	5	3	4	3	4	6	5	3	5	4	3	4.14
95	C	Press	Direct	5	6	4	6	3	6	6	4	3	1	4	2	2	6	2	4	4	5	4	4	4	4.05
96	A	Punch	Direct	6	4	6	1	4	3	5	5	6	5	5	6	5	4	6	6	5	6	3	5	6	4.86

Laban-Trained Participants, Semantic Differential Scale Data: *Time Factor*

Q.	Cond.	Action Drive	Element	Participant Code (n = 21)																	Mean				
				1	2	3	5	6	7	15	19	20	23	27	29	32	33	34	35	36		37	42	44	45
1	C	Glide	Sust.	5	5	5	6	5	5	4	6	6	6	3	6	4	4	3	5	6	4	x	4	3	4.75
2	D	Punch	Quick	5	6	6	6	5	6	5	5	6	6	6	5	4	4	6	5	4	5	5	4	5	5.19
3	A	Dab	Quick	5	4	3	3	6	4	6	6	3	4	5	4	5	1	5	3	5	4	3	5	4	4.19
4	D	Press	Sust.	6	4	5	1	5	5	5	6	5	5	4	4	2	4	4	5	6	3	3	4	2	4.19
5	A	Float	Sust.	4	5	4	3	4	6	3	2	6	5	3	5	5	4	5	5	6	4	4	4	4	4.33
6	C	Slash	Quick	5	6	5	2	5	6	4	6	6	2	2	6	3	1	5	6	2	4	5	4	5	4.29
7	B	Glide	Sust.	6	6	6	3	6	6	5	6	5	5	5	6	6	4	5	6	6	4	5	5	5	5.29
8	C	Float	Sust.	6	6	6	6	6	3	6	5	6	5	5	5	6	5	4	6	6	5	6	6	4	5.38
9	B	Press	Sust.	3	2	3	2	4	2	2	6	3	5	4	3	4	2	3	3	6	3	3	5	2	3.33
10	A	Flick	Quick	5	5	5	4	4	6	6	5	5	5	5	5	5	3	5	5	5	4	3	5	5	4.76
11	B	Slash	Quick	5	5	6	6	6	6	5	5	5	5	5	5	4	4	4	6	4	5	6	5	5	5.10
12	C	Wring	Sust.	4	3	3	6	5	5	4	4	5	5	3	4	5	4	6	5	4	5	3	5	3	4.33
13	D	Flick	Quick	6	4	5	6	6	6	5	6	6	5	5	5	6	2	6	5	5	5	4	5	4	5.10
14	A	Press	Sust.	5	4	4	6	5	5	4	6	6	5	3	5	5	2	3	5	5	4	4	5	4	4.52
15	B	Flick	Quick	6	5	5	4	5	6	6	6	6	5	6	4	5	3	5	4	5	4	4	5	5	4.95
16	D	Glide	Sust.	5	5	5	1	6	6	6	5	6	6	5	6	5	5	5	5	6	3	6	6	5	5.14
17	B	Wring	Sust.	5	4	4	4	6	4	6	5	4	6	4	5	5	2	4	4	6	3	5	5	4	4.52
18	C	Flick	Quick	6	5	5	4	6	6	4	6	6	5	5	5	6	2	3	5	5	4	4	5	4	4.81
19	A	Glide	Sust.	6	4	4	5	4	4	5	6	4	5	4	6	4	3	3	6	5	3	4	5	3	4.43
20	C	Dab	Quick	4	2	4	3	4	5	2	3	4	5	2	3	6	3	4	3	5	2	2	2	4	3.43
21	A	Wring	Sust.	4	4	3	3	4	5	3	6	5	5	5	3	6	2	5	3	5	3	4	5	4	4.14
22	D	Dab	Quick	6	5	5	6	5	6	6	6	6	5	5	5	6	2	5	6	6	5	4	6	4	5.24
23	B	Float	Sust.	5	4	3	2	4	4	4	5	6	5	5	5	4	5	3	2	3	4	5	5	5	4.19
24	A	Slash	Quick	5	5	6	2	6	5	6	6	5	5	5	5	3	3	6	4	4	5	4	5	2	4.62
25	C	Press	Sust.	4	4	3	5	6	4	2	6	5	5	3	4	5	3	4	3	5	3	3	6	3	4.10
26	B	Punch	Quick	5	6	6	4	6	6	5	2	6	5	5	4	1	3	6	6	5	5	5	6	4	4.81
27	D	Float	Sust.	6	6	6	1	6	6	6	6	6	5	6	6	4	5	6	5	6	5	6	6	6	5.48
28	A	Punch	Quick	6	6	5	6	6	6	5	5	5	5	5	4	4	4	6	6	6	5	5	6	4	5.24
29	B	Dab	Quick	5	4	4	5	5	5	5	4	3	4	4	3	5	1	4	4	6	2	4	3	5	4.05
30	D	Slash	Quick	5	5	5	4	6	4	6	6	4	5	5	6	5	5	5	5	5	5	6	5	6	5.14
31	C	Punch	Quick	6	6	6	2	6	5	4	5	6	6	5	6	3	3	5	6	3	4	6	5	4	4.86
32	D	Wring	Sust.	4	4	3	1	4	5	2	6	4	4	4	4	2	3	5	3	6	4	5	5	4	3.90

Laban-Trained Participants, Semantic Differential Scale Data: *Weight Factor*

Q.	Cond.	Action Drive	Element	Participant Code (<i>n</i> = 21)																					Mean
				1	2	3	5	6	7	15	19	20	23	27	29	32	33	34	35	36	37	42	44	45	
33	A	Glide	Light	5	4	4	2	4	3	4	5	4	5	5	3	3	3	4	5	3	5	5	4	4	4.00
34	D	Slash	Strong	5	5	5	6	5	5	5	4	5	4	4	5	5	5	3	5	5	5	5	5	4	4.76
35	B	Punch	Strong	6	6	6	6	6	6	5	6	5	5	6	6	6	6	3	6	6	6	6	6	5	5.67
36	C	Wring	Strong	3	4	4	4	4	5	4	5	4	3	4	5	5	5	5	3	4	4	x	4	4	4.15
37	B	Float	Light	6	5	5	5	5	5	5	6	6	5	5	5	5	5	5	6	4	5	6	5	5	5.19
38	C	Dab	Light	6	6	4	6	6	6	6	6	6	5	6	6	5	4	3	5	4	5	6	6	6	5.38
39	A	Float	Light	5	6	4	6	5	4	4	5	6	5	5	4	6	5	4	4	3	4	4	5	3	4.62
40	D	Dab	Light	5	4	3	3	6	6	5	5	5	5	4	4	4	6	6	4	3	4	6	5	5	4.67
41	C	Press	Strong	4	4	4	3	4	5	4	6	5	4	4	5	5	5	4	5	5	4	4	4	4	4.38
42	B	Dab	Light	4	4	4	4	4	5	4	4	5	5	5	4	4	4	4	3	3	4	5	5	4	4.19
43	C	Slash	Strong	5	5	5	6	5	6	5	5	6	4	5	6	6	5	3	6	6	5	5	5	5	5.19
44	A	Punch	Strong	5	5	5	6	5	6	5	5	5	5	5	6	6	6	2	6	6	6	6	6	5	5.33
45	D	Glide	Light	5	6	6	6	6	6	5	6	6	5	6	5	6	5	3	6	4	6	6	6	5	5.48
46	A	Flick	Light	2	3	2	2	1	2	4	2	2	2	3	4	3	2	1	3	2	3	2	1	2	2.29
47	D	Float	Light	6	6	6	5	6	5	6	6	5	6	6	6	6	3	1	5	5	6	6	5	6	5.33
48	B	Wring	Strong	4	5	5	4	5	5	4	6	4	4	4	2	5	5	5	5	6	4	6	4	5	4.62
49	D	Punch	Strong	5	6	6	6	6	6	6	6	6	4	5	5	6	4	3	5	5	5	4	6	5	5.24
50	B	Press	Strong	3	4	4	3	4	4	4	4	4	4	3	4	5	5	3	4	4	4	4	4	4	3.90
51	A	Slash	Strong	4	5	5	5	4	4	6	3	4	5	4	5	5	3	2	5	5	5	4	5	4	4.38
52	C	Flick	Light	5	5	4	3	5	5	6	5	5	5	5	3	5	5	5	5	4	5	5	5	5	4.76
53	A	Dab	Light	5	4	5	4	6	6	6	6	6	5	5	5	5	5	5	6	4	5	6	6	6	5.29
54	D	Wring	Strong	4	5	4	3	5	4	3	5	6	4	3	3	4	6	6	4	4	4	5	5	5	4.38
55	B	Slash	Strong	6	6	6	6	6	6	6	6	6	6	5	6	6	6	4	6	5	6	6	6	5	5.76
56	A	Wring	Strong	3	3	4	3	4	3	3	5	5	3	3	5	4	4	3	3	4	4	3	4	4	3.67
57	D	Press	Strong	2	4	3	3	3	2	4	3	3	2	2	3	3	3	4	3	4	3	2	3	3	2.95
58	B	Flick	Light	5	4	5	3	6	4	3	5	5	5	5	6	4	4	5	4	3	5	5	4	4	4.48
59	A	Press	Strong	2	5	4	2	4	5	3	5	5	3	4	5	5	5	5	5	5	5	5	5	4	4.33
60	C	Glide	Light	6	6	6	5	6	5	6	5	6	6	5	5	5	5	5	6	3	5	5	5	6	5.33
61	D	Flick	Light	5	5	5	3	6	5	5	6	5	5	5	5	3	6	4	5	4	4	5	5	5	4.81
62	C	Float	Light	6	5	5	6	6	6	6	4	6	5	6	4	5	5	6	6	3	6	6	6	6	5.43
63	B	Glide	Light	6	4	4	5	4	4	6	4	5	5	5	5	3	5	4	5	4	6	5	6	4	4.71
64	C	Punch	Strong	5	6	6	6	6	6	6	6	6	4	6	5	5	5	3	6	6	6	5	6	5	5.48

Laban-Trained Participants, Semantic Differential Scale Data: *Space Factor*

Q.	Cond.	Action Drive	Element	Participant Code (<i>n</i> = 21)																				Mean	
				1	2	3	5	6	7	15	19	20	23	27	29	32	33	34	35	36	37	42	44		45
65	C	Flick	Indirect	4	2	2	4	4	2	2	4	4	2	5	2	5	5	4	2	2	3	4	4	2	3.24
66	D	Wring	Indirect	5	2	3	3	3	1	3	2	5	3	5	6	4	6	6	2	2	3	3	3	2	3.43
67	A	Flick	Indirect	2	3	3	1	3	3	6	5	2	1	2	1	4	2	1	3	4	5	5	4	4	3.05
68	B	Glide	Direct	2	3	3	1	3	2	1	2	5	2	2	3	2	6	4	1	2	3	4	2	2	2.62
69	C	Slash	Indirect	2	1	1	2	2	1	2	3	1	4	1	4	5	5	2	1	1	1	2	2	2	2.14
70	A	Dab	Direct	3	2	5	3	4	3	2	2	5	6	6	4	3	2	5	4	5	3	1	4	4	3.62
71	B	Wring	Indirect	5	4	4	3	3	2	4	3	5	2	4	2	6	3	5	5	3	3	3	4	4	3.67
72	C	Punch	Direct	5	6	6	6	5	6	5	5	6	3	6	4	5	1	4	5	6	6	5	6	6	5.10
73	D	Slash	Indirect	5	1	1	1	2	1	3	2	5	1	2	4	4	3	3	2	2	3	2	2	1	2.38
74	C	Wring	Indirect	2	3	2	2	2	1	2	2	6	6	3	2	4	1	5	6	3	2	1	4	3	2.95
75	B	Float	Indirect	6	4	5	1	4	5	3	5	5	4	4	4	6	3	3	4	3	4	2	5	4	4.00
76	D	Flick	Indirect	2	4	1	6	3	5	4	5	2	2	2	1	2	1	3	2	3	5	4	3	2	2.95
77	C	Glide	Direct	3	4	1	1	2	3	1	3	1	1	3	5	1	4	3	3	4	1	4	1	2	2.43
78	A	Slash	Indirect	2	2	1	1	4	1	2	2	2	2	1	5	5	4	4	2	1	2	5	2	2	2.48
79	D	Glide	Direct	4	3	5	3	2	1	5	4	3	5	3	5	2	5	2	3	4	4	4	1	2	3.33
80	A	Press	Direct	5	5	4	3	2	1	1	3	1	3	4	1	3	5	2	2	4	5	4	4	2	3.05
81	C	Float	Indirect	3	3	5	5	6	3	6	3	6	6	4	3	3	4	1	4	4	5	5	5	5	4.24
82	A	Wring	Indirect	4	3	4	3	5	3	4	5	5	4	3	6	5	6	6	4	4	3	4	4	4	4.24
83	B	Flick	Indirect	4	2	1	1	4	3	5	2	1	1	2	4	2	4	4	2	1	3	3	3	2	2.57
84	D	Punch	Direct	2	6	5	2	4	6	3	6	6	5	6	2	4	1	4	6	6	5	4	5	6	4.48
85	B	Press	Direct	4	3	2	2	3	6	4	5	2	4	4	5	1	5	4	3	3	4	3	3	3	3.48
86	D	Dab	Direct	6	2	5	6	3	2	2	4	6	6	6	6	5	4	4	5	5	2	3	4	5	4.33
87	A	Glide	Direct	5	2	2	4	3	4	1	3	2	3	3	5	1	5	2	3	4	3	3	2	3	3.00
88	B	Slash	Indirect	5	1	2	3	3	1	2	2	2	2	3	6	5	5	3	3	1	1	3	1	1	2.62
89	D	Press	Direct	4	3	3	1	2	1	3	6	2	4	3	2	3	4	2	5	3	4	5	2	2	3.05
90	B	Punch	Direct	3	5	6	1	4	6	4	5	6	6	6	2	6	1	5	6	5	6	3	6	6	4.67
91	D	Float	Indirect	3	6	4	2	5	6	2	5	5	5	6	3	5	4	5	6	5	4	5	6	5	4.62
92	C	Dab	Direct	1	6	4	4	2	1	1	2	4	1	3	2	4	1	5	2	3	1	4	4	2	2.71
93	A	Float	Indirect	3	5	4	1	6	4	2	6	4	5	4	3	6	6	5	3	4	5	4	5	3	4.19
94	B	Dab	Direct	3	3	6	6	5	4	1	3	5	6	5	3	4	3	4	6	5	3	5	4	3	4.14
95	C	Press	Direct	5	6	4	6	3	6	6	4	3	1	4	2	2	6	2	4	4	5	4	4	4	4.05
96	A	Punch	Direct	6	4	6	1	4	3	5	5	6	5	5	6	5	4	6	6	5	6	3	5	6	4.86

Novice Participants, Binary Data: *Time Factor*

Q	Cond.	Action Drive	Element	Participant Code (n = 21)																					Mean
				1	2	3	5	6	7	15	19	20	23	27	29	32	33	34	35	36	37	42	44	45	
1	C	Glide	Sust.	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	X	1	0	0.85	
2	D	Punch	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
3	A	Dab	Quick	1	1	0	0	1	1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	0.71	
4	D	Press	Sust.	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	0	0	1	0	0	0.76	
5	A	Float	Sust.	1	1	1	0	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	0.81	
6	C	Slash	Quick	1	1	1	0	1	1	1	1	1	0	0	1	0	0	1	1	0	1	1	1	0.71	
7	B	Glide	Sust.	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.95	
8	C	Float	Sust.	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.95	
9	B	Press	Sust.	0	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	1	0	0	1	0.33	
10	A	Flick	Quick	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0.90	
11	B	Slash	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
12	C	Wring	Sust.	1	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	0	0.76	
13	D	Flick	Quick	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0.95	
14	A	Press	Sust.	1	1	1	1	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	0.86	
15	B	Flick	Quick	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0.95	
16	D	Glide	Sust.	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0.90	
17	B	Wring	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0.90	
18	C	Flick	Quick	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0.90	
19	A	Glide	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	0	0.81	
20	C	Dab	Quick	1	0	1	0	1	1	0	0	1	1	0	0	1	0	1	0	1	0	0	0	0.48	
21	A	Wring	Sust.	1	1	0	0	1	1	0	1	1	1	0	1	0	1	0	1	0	1	1	1	0.67	
22	D	Dab	Quick	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0.95	
23	B	Float	Sust.	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0.76	
24	A	Slash	Quick	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	0.81	
25	C	Press	Sust.	1	1	0	1	1	1	0	1	1	1	0	1	1	0	1	0	1	0	0	1	0.62	
26	B	Punch	Quick	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1	1	0.86	
27	D	Float	Sust.	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.95	
28	A	Punch	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
29	B	Dab	Quick	1	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	0	1	0	1	0.76	
30	D	Slash	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
31	C	Punch	Quick	1	1	1	0	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	0.81	
32	D	Wring	Sust.	1	1	0	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1	1	1	0.71	

Novice Participants, Binary Data: *Space Factor*

Q	Cond.	Action Drive	Element	Participant Code (n = 21)																					Mean
				1	2	3	5	6	7	15	19	20	23	27	29	32	33	34	35	36	37	42	44	45	
65	C	Flick	Indirect	1	0	0	1	1	0	0	1	1	0	1	0	1	1	1	0	0	0	1	1	0	0.52
66	D	Wring	Indirect	1	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0.33
67	A	Flick	Indirect	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	1	1	1	1	1	0.38
68	B	Glide	Direct	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0.19
69	C	Slash	Indirect	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0.19
70	A	Dab	Direct	0	0	1	0	1	0	0	0	1	1	1	1	0	0	1	1	1	0	0	1	1	0.52
71	B	Wring	Indirect	1	1	1	0	0	0	1	0	1	0	1	0	1	0	1	1	0	0	0	1	1	0.52
72	C	Punch	Direct	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0.90
73	D	Slash	Indirect	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0.19
74	C	Wring	Indirect	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	1	0	0	0	1	0	0.29
75	B	Float	Indirect	1	1	1	0	1	1	0	1	1	1	1	1	1	0	0	1	0	1	0	1	1	0.71
76	D	Flick	Indirect	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0.33
77	C	Glide	Direct	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0.24
78	A	Slash	Indirect	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	0	1	0	0	0.29
79	D	Glide	Direct	1	0	1	0	0	0	1	1	0	1	0	1	0	1	0	0	1	1	1	0	0	0.48
80	A	Press	Direct	1	1	1	0	0	0	0	1	0	0	1	0	0	1	0	0	1	1	1	1	0	0.48
81	C	Float	Indirect	0	0	1	1	1	0	1	0	1	1	1	0	0	1	0	1	1	1	1	1	1	0.67
82	A	Wring	Indirect	1	0	1	0	1	0	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0.76
83	B	Flick	Indirect	1	0	0	0	1	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0.29
84	D	Punch	Direct	0	1	1	0	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0.76
85	B	Press	Direct	1	0	0	0	0	1	1	1	0	1	1	1	0	1	1	0	0	1	0	0	0	0.48
86	D	Dab	Direct	1	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0.71
87	A	Glide	Direct	1	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0.29
88	B	Slash	Indirect	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0.19
89	D	Press	Direct	1	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	1	1	0	0	0.33
90	B	Punch	Direct	0	1	1	0	1	1	1	1	1	1	1	0	1	0	1	1	1	1	0	1	1	0.76
91	D	Float	Indirect	0	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	0.81
92	C	Dab	Direct	0	1	1	1	0	0	0	0	1	0	0	0	1	0	1	0	0	0	1	1	0	0.38
93	A	Float	Indirect	0	1	1	0	1	1	0	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0.71
94	B	Dab	Direct	0	0	1	1	1	1	0	0	1	1	1	0	1	0	1	1	1	0	1	1	0	0.62
95	C	Press	Direct	1	1	1	1	0	1	1	1	0	0	1	0	0	1	0	1	1	1	1	1	1	0.71
96	A	Punch	Direct	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0.86

Laban-Trained Participants, Binary Data: *Time Factor*

Q	Cond.	Action Drive	Element	Participant Code (n = 24)																								Mean	
				4	8	9	10	11	12	13	14	16	17	18	21	22	24	25	26	28	30	31	38	39	40	41	43		
1	C	Glide	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0.96		
2	D	Punch	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00		
3	A	Dab	Quick	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96		
4	D	Press	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00		
5	A	Float	Sust.	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	0.88	
6	C	Slash	Quick	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	
7	B	Glide	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
8	C	Float	Sust.	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	
9	B	Press	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0.92	
10	A	Flick	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
11	B	Slash	Quick	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0.92	
12	C	Wring	Sust.	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0.92	
13	D	Flick	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
14	A	Press	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
15	B	Flick	Quick	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	
16	D	Glide	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0.92	
17	B	Wring	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
18	C	Flick	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
19	A	Glide	Sust.	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	
20	C	Dab	Quick	0	0	0	0	1	0	0	1	1	1	0	0	0	0	1	1	1	1	0	0	1	1	1	1	0.50	
21	A	Wring	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
22	D	Dab	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
23	B	Float	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0.96	
24	A	Slash	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
25	C	Press	Sust.	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.96	
26	B	Punch	Quick	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0.92
27	D	Float	Sust.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
28	A	Punch	Quick	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0.96	
29	B	Dab	Quick	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0.96	
30	D	Slash	Quick	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00	
31	C	Punch	Quick	1	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0.88	
32	D	Wring	Sust.	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0.88	

VITA

Amanda Huntleigh serves as the Assistant Director of Choral Activities and Lecturer at Smith College. There, she co-directs choirs, and also teaches studio voice, aural skills, and a newly-designed music appreciation course. Huntleigh's publications include the first and second editions of *Concerts Decoded: Listening Like You Mean It*, a listening-centered music appreciation textbook co-authored with Nicole Harreld. To support her research, Huntleigh completed the Integrated Movement Studies program in January 2016 to become a Certified Laban/Bartenieff Movement Analyst. Earlier in her career, she taught choral, instrumental, and general music in Illinois, Virginia, and Delaware public schools. Huntleigh also holds a Master of Music degree in Conducting from George Mason University and a Bachelor of Music Education degree from Wartburg College.