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The Identification of Conductor-Distinguished Functions of Conducting

by *Alan J. Gumm: Central Michigan University – Sharyn L. Battersby: Catholic University of America – Kathryn L. Simon: University of Miami – Andrew E. Shankles: Central Michigan University*

Abstract

The purpose of the present study was to identify whether conductors distinguish functions of conducting similarly to functions implied in previous research. A sample of 84 conductors with a full range of experience levels (M = 9.8) and of a full range of large ensemble types and ensemble age levels rated how much they pay attention to 82 research-derived conducting considerations as they conduct. The subject-to-variable ratio was smaller than advisable for factor analysis, yet the representatively diverse sample provided reliable ratings (a = .95) and factor results that corroborate traditional music-related functions—Mechanical Precision Function and Expressive Function—and nontraditional musician-oriented functions—Motivational Function, Physical Technique Function, Psychosocial Function, and Unrestrained Tone Function. Functions were discovered to divide based on opposing aims to *control* precise mechanics, musician attention, and musician energy and range of motion versus to *release* expression, tension and control of tone and tempo, and control of musicians in favor of sharing control with musicians. The six functions bring new clarity to the trends of conducting research and establish a potential new standard for conducting. Future research is needed to evaluate construct validity and determine reliable and valid measures of these six conducting functions.

Introduction

Researchers have long sought to detect and sort out the many individual behaviors of conducting. Altogether, the list has extended to include types of baton grips, preparatory gestures, ending gestures, beat patterns, cues, left hand dynamics, postures, body movements, gazes, facial expressions, uses of space, and nonverbal illustrators, emblems, and displays of emotion (Berz, 1983; Grechesky, 1985; Roshong, 1978; Seddon, 2007). But by comparison, our understanding of the different functions toward which gestures are directed remains less developed. While Berz (1983) defines conducting behaviors by their function as neutral, personal, musical, technical, entertaining, motivational, or nonfunctional, an accounting of these functions was not of concern or consequence to the research.

Functions of conducting have been the focus of historical and philosophical research. Gibala-Maharidge (2005) explains how choral conductors came to function as musician trainers, music interpreters, and performers based on roles previously played by a resident composer, keyboardist, membership organizer, or tempo keeper within or around an ensemble. From a philosophical viewpoint, O'Bryant (2006) points out functional differences in orchestra directors' attention to surface or deep levels of music, technical or non-technical means of communication, conductor-reliant or self-reliant interactions with people, and different technical performance practices or schools of thought. Functions of conducting have yet to be as broadly investigated in empirical research.

A primary distinction asserted or implied in empirical research is between the two most

traditional functions of conducting: surface-level mechanics of music versus deep-level interpretive expression of music. Wöllner & Auhagen (2008) found that the two functions are typically divided between the right hand for the mechanical organization of the ensemble and the left hand for expression, which leads to different perceptions and responses by musicians to the left and right of the conductor. Bergee (2005) found that novices focus more on surface levels of music and experts focus on deeper levels such as balance and style. Consistently, mechanical precision, more than expression, is shown to be the prevalent focus in both introductory and advanced conducting courses (Boardman, 2000; Chapman, 2008; Manfredo, 2008). Getting conductors to be more expressive—and less mechanically oriented, by implication—is the stated purpose in research of pedagogical methods such as Dalcroze Eurythmics (Baker, 1992; Dickson, 1992), Laban movement analysis (Gambetta, 2005; Holt, 1992; Plaag, 2006), kinesic nonverbal communication (Krudop, 2003; Mathers, 2009), theater-acting exercises (Baker, 1992; Running, 2008), and metaphorical gestures (Wis, 1993), with mime also posed as a potential source of expressive gestures (MacKay, 2008). Even the functions detected in a century of conducting textbooks, variously called timing, clarity of beat, meter/tempo, start-stop, profundity, and interpretive (Manternach (2009), fall within a dichotomy of mechanics versus expression.

Effective teaching research suggests a third function, to motivate musicians. Yarborough (1975) points out that the magnitude or intensity of conductor behavior effectively influences musicians' attitude and attention to the conductor. Byo (1990) shows that conductor intensity can be recognized and readily modeled by conducting students. The motivational function of intense conducting behaviors is confirmed in Gumm's (1993) detection of a nonverbal motivational factor of music teaching style and in Chagnon's (2001) finding that ensemble concentration and focus improve with changes in physical activity. Yet to be researched is whether conductors distinguish the motivational role of conducting apart from other functions of conducting.

A fourth function of conducting stated or implied in research is a technical function. Though O'Bryant (2006) poses this as a philosophical distinction of orchestra conductors, the effects of conducting on musicians' physical performance technique is most researched in the choral field. Chagnon (2001) reveals the use of movement by choral conductors to release tension, change energy levels, draw out tone, and improve vocal technique in singers. Fuelberth (2004) demonstrates that certain left hand conducting gestures lead to vocal tension in singers. Manternach (2009) shows that the conductor's type of preparatory gesture and head and shoulder movement influences whether singers move in helpful or detrimental ways during breathing, and further that singers can distinguish a "Singing Technique" function of conducting apart from "Entrance/Cutoff/Timing" and "Expressive Singing" functions. Yet to be researched is whether practicing conductors distinctly aim to meet the technical needs of musicians as they conduct.

A fifth function implied in the research field is a psychosocial function of collaboration between the conductor and ensemble musicians. Toney (2000) concludes that a collaborative approach was a crucial factor in the high level of performance of one expert conductor's choirs, and O'Bryant (2006) concludes that understanding and adjusting to group needs are more important to conducting than technique and mechanical precision. Cofer (1998) shows that collaboratively sharing the intentions of conducting gestures can improve response to conducting. Chagnon (2001) reveals how choral conductors sensitize musicians to gestures to improve their response, adapt movements from these interactions into their conducting, and otherwise draw the ensemble into helping interpret the music. Sharlow (2006) points out that conducting, among other activities in and out of the rehearsal room, builds a sense of community within an ensemble and that conductors work toward making a spiritual, emotional, and/or mystical connection with musicians in the ensemble. A further investigation of such connections and collaborations and whether conductors distinguish them as a separate conducting function is warranted.

The purpose of the present study was to identify whether conductors distinguish different functions of conducting, and whether their distinctions are similar to those implied in previous research. Specific research objectives were to (a) obtain reliable ratings of an extensive list of conducting considerations drawn from previous research, (b) identify global factors, dimensions, or constructs of conducting as distinguished by conductors, (c)

infer the function represented by each identified factor, and (d) verify the similarity between functions identified in the present study and functions implied in previous research. The development of a conclusive measure of conducting functions was not an objective of the present study.

Method

Data were collected on a survey form that asked for background information and for ratings of a list of conducting considerations compiled from previous related research. An initial compiled list of survey items was evaluated by co-investigators for design and clarity, or face validity, and for uniqueness of each item and thoroughness of the entire set of items, or content validity, resulting in a list of 82 items for use in the present study. Participants were asked to rate on a scale of *none, least, occasional, frequent*, and *most* how much attention they give to each issue as they conduct, a method designed to infer functions based on variations in conductor ratings instead of asking conductors to directly associate conducting considerations with any list of functions preconceived by researchers.

Data were collected during fall semester 2009 at three university sites, one in eastern, one in southeastern, and one in central United States. Approximately 500 invitations and surveys were distributed by hand and through departmental electronic email lists, with the approximation accounting for an unconfirmed number of successful contacts through each university email list, duplicate invitations through both manners of invitation, and the exact number of surveys indirectly distributed to area music teachers remaining unknown. Data were collected on a volunteer basis of those willing to complete this length of survey during the course of a semester, with reminders sent out across a two week period to encourage a higher return rate. Even so, only 84 surveys were submitted with complete enough information for use in the research, which represents an approximate 16.8% return rate and a 1:1 subject-to-variable ratio. Based on background information data, participants had an average of 9.8 years of experience, including 16 first year conducting students, 24 with two to four years of conducting training or experience, 14 with five to 10 years of experience, 14 with 11 to 20 years of experience, 11 participants with 21 to 40 years of experience, and five who did not provide background information. Thirty-five designated themselves as primarily band directors, 13 as orchestra conductors, and 31 as choral directors. Six stated that they had the most experience conducting children, nine had the most experience with middle level, 27 with high school, 35 with college-age (college-ensemble conductors and student-conductors), and seven with adult-age musicians.

For the first research objective of obtaining reliable ratings, alpha reliability was computed for the full set of survey items and with each item removed. For the second research objective, because functions were assumed to be interrelated, principal axis factoring or common factor analysis with Varimax rotation was used to analyze the variance in common between survey items, instead of more divisive factoring techniques used to analyze the unique variance of discrete constructs. In determining the appropriate factor solution, a combination of criteria summarized by Asmus (1989) was considered, including the eigenvalue-of-one criterion, breaks in the scree test graph of eigenvalues, the interpretability of the factors, and the amount of variance accounted by the factors. Because particular conducting issues drawn from the research may turn out to be ambiguous or divided in function, it was expected in the present study that most but not all survey items would load clearly into particular factors, yet that cross loadings on multiple factors would still be helpful in interpreting the function represented by each factor.

Results

An alpha reliability of .95 resulted for the set of 82 survey items. Alpha reliability increased to .97 with the item “Expressing the mood of the music” removed, and lowered with the removal of any other survey item.

Compared to a 3:1 subject-to-item ratio suggested by Asmus (1989) for factor analysis, a 1:1 ratio was achieved in the present study. A 23-factor solution accounting for 80% of ratings variance resulted based on the default eigenvalue-of-one criterion, but it lacked adequate numbers of items per factor. Four factors remained consistent from the four- to seven-factor solutions, with the six-factor solution (see Tables 1, 2, and 3) chosen based on clear interpretability of the entire set of factors and adequate number of items per factor. Though it accounted for only 46.7% of variance in survey ratings, the seven-, eight-, and nine-factor solutions explained minimal additional variance and additional factors had few strong loadings. No factor loadings of .30 or higher resulted for the items "Left hand mirroring of right hand patterns" and "Expressing the mood of the music."

Table 1

Factor Solution: Mechanical and Expressive Functions

Survey Items	Factors (Conducting Functions)					
	1	2	3	4	5	6
1. Mechanical Function						
Clear indications of rhythm.	.67					
Precise cutoff releases.	.66					
Calling attention to tempo changes.	.63					
Distinctive meter patterns.	.63					
Carefully placed metrical conducting patterns.	.60				-.38	
Visibly distinct cues.	.59	.36				
Clearly visible downbeats.	.54					
Precise "ictus" points of beat.	.54				.34	
Responding to changing legato, staccato, and marcato styles.	.52	.47				
Signals for sections to balance each other in loudness.	.51		.31			.34
Precise tempo indications.	.49	.43				
Conducting with the intent to share control with the ensemble.	.39		.33		.33	.36
Distinguishing heavy-to-light weighted accents.	.38	.32		.35		.36
2. Expressive Function						
Gesturing expressive markings in the score.		.73				
Shaping the contour of phrases.		.73				
Shaping the overall expressive character of the music.		.72				
Gestures that carefully match score features.		.68				.35
Highlighting peaks across phrases.		.65				
Independent left hand gestures.		.63				
Facial expressions to stimulate emotional responses in musicians.		.60				.33
Rousing gestures for emotional responses in musicans.		.56				
Gestures that convey the emotional intent of music.		.56				
Changes of dynamics shown within the right hand meter pattern.		.55				
Facial expressions that reflect the emotion of the music.		.52		.31		
Synchronizing ensemble expressions.		.52				.47
Gestures to guide musicians' articulations.		.49	.32	.30		

Gestures to shape the resonant quality produced by the ensemble.		.48	.32		.37	
Gestures for accurate ensemble timing.		.45				
Conducting from a sense of unity with the ensemble rather than dominance.		.44			.32	.37
Enthusiasm of gestures.		.44		.33		.30
Keeping ensemble members synchronized.	.37	.43				
Gestures that ask and draw toward rather than require to happen.		.40		.36	.37	
Drawing out the flow of tone.		.38	.32		.35	.31
Tracing the direction of tone desired from musicans.		.34				
Left hand changes of dynamics.		.34				

Table 2

Factor Solution: Motivational and Physical Technique Functions

Survey Items	Factors (Conducting Functions)					
	1	2	3	4	5	6
3. Motivational Function						
Maintaining eye contact with ensemble members.			.67			
Circulating away from the podium as you conduct.			.57			
Signaling reminders for musicians to use correct techniques.			.56			
Visually modeling proper skills for musicians to copy as they make music.			.50			
Focusing ensemble attention with the eyes.			.46			
Pointing out when ensemble members' minds wander.			.44			.35
Shifting your gaze to maintain ensemble members alertness.			.44			
Expressive motions within the right hand meter pattern.		.41	.44			
Gesturing to secure solid section entrances.	.37		.39			
Honing gestures toward the ones that worked best in rehearsal.			.34			
4. Physical Technique Function						
Depicting phsyical energy levels required of musicans.				.70		
Signaling the muscle strength needed to produce a desired musical sound.				.67		
Directing the size of movements required of musicans.	.30			.57		
Gestures to evoke a relaxed performance from musicians.		.33		.55		.43
Gesturing new energy levels in musicians.		.39		.54		
Mimicking the physical motions musicians need to do as they make music.			.33	.49		
Motions outside of typical conducting that match the music.				.48		
Keeping gestures clever to keep the ensemble spontaneous.				.46	.33	
Changing your physical energy level.				.45	.32	
Maintaining a balanced stance that models healthy				.44		

performance technique.						
Attention-getting facial expressions.				.40		.36
Inventive right hand gestures that stray outside the meter pattern.				.35		

Table 3

Factor Solution: Psychosocial and Unrestrained Tone Functions

Survey Items	Factors (Conducting Functions)					
	1	2	3	4	5	6
5. Psychosoical Function						
Choosing gestures based on ensemble member ideas.					.69	
Adapting expressions developed by ensemble members into my conducting.					.63	
Derive gestures from a perspective of vulnerability rather than control.					.62	.33
Responding to creative expressions heard within the ensemble.		.34	.35	.37	.55	
Miming objects as metaphors to the music.	.31				.48	
Helping ensemble members learn to conduct.			.31		.47	
Sharing what your conducting means with the ensemble.		.31			.46	.45
Having musicians mirror your conducting gestures with their hands.			.30		.43	
Exploring for gestures musicians react to best.		.40	.34		.48	
Drawing from musicians' experiences for which gestures to use.				.46	.43	
Dramatizing the story in the music.				.34	.40	.33
Putting ensemble members at the podium to conduct.					.38	
Changing your phsyical conducting stance.					.34	
6. Unrestrained Tone Function						
Gestures for musicians to release tension in their technique.						.77
Motions to relieve tension in musicians' performance.						.74
Discontinuing gestures so musicians learn to function on their own.						.68
Providing expressions to reduce musician anxiety.						.67
Shaping the ensemble tone.		.41				.52
Stopping conducting for musicians to develop their own internal tempo.			.41			.52
Minimizing motion so musicians learn to follow each other's influences.						.51
Conducting stances that energize musicians.				.36		.43
Working to keep gestures fresh and unexpected.		.34		.31		.37
Depicting the weight of the ensemble's sound.		.32				.33
Left hand mirroring of right hand patterns.						
Expressing the mood of the music.						

Note: Factor loadings less than .30 are omitted

Discussion

The purpose of the present study was to identify whether conductors distinguish functions of conducting similarly to those implied in previous research. Evidence supports reasonable success in achieving the purpose and objectives of the study, with (a) highly reliable ratings by participants in three different geographic regions, (b) the identification of global factors as distinguished by a representative though relatively small sample of conductors, (c) interpretability of meaningful functions for each factor, and (d) corroboration of five conducting functions implied in previous research and identification of a viable sixth function previously not separately asserted.

Two functions that are traditionally associated with conducting (Bergee, 2005; Boardman, 2000; Chapman, 2008; Manfredo, 2008; Wöllner & Auhagen, 2008) were verified: a Mechanical Precision Function and an Expressive Function that serve to communicate different sets of characteristics in the musical score. Four nontraditional functions that focus beyond the music to address musicians also resulted:

1. A Motivational Function that aims to heighten musicians' mental focus, and corroborates research of magnitude or intensity of conductor behavior (Byo, 1990; Yarborough, 1975) and music teaching style (Gumm, 1993);
2. A Physical Technique Function that directs musicians' range and energy of motion, and corroborates a previously proposed technical function (Manternach, 2009) and an assortment of gestures previously associated with performance technique (Chagnon, 2001; Fuelberth, 2004; Manternach, 2009);
3. A Psychosocial Function that facilitates shared influence between a conductor and ensemble musicians, and corroborates research of ensemble collaboration (Chagnon, 2001; Cofer, 1998; Sharlow, 2006; Toney, 2000); and
4. An Unrestrained Tone Function that releases tension and control for musicians to unify their tone and tempo independent of the conductor, and comprises a subset of items previously associated with performance technique (Chagnon, 2001; Fuelberth, 2004; Manternach, 2009).

Overall, results indicate that the conductors who participated in this study did distinguish conducting functions out of an array of distinct behaviors and issues, and that the functions they distinguished are similar to those implied in previous research. This suggests that previous research of conducting has advanced along lines that are meaningful to student and experienced conductors and has broadened and deepened the understanding of conducting beyond traditional lines of mechanics and expression. The six functions bring new clarity to the trends of conducting research and present a potential new standard for the art of conducting, with further research first required to evaluate the construct validity of these functions.

The overall findings of the present study can be interpreted two ways. First is that traditional music-related functions of conducting do not represent the full extent of a conductor's attention and effort in conducting. Beyond the musical score, a conductor also attends to the musicians making the music—alerting them, guiding their physical performance, collaborating with them toward a mutual interpretation, and freeing them to release a beautiful tone. An alternative interpretation is that results are a reflection of divergent "schools" or "camps" of conducting practices, camps made evident in the varying trends of previous research. Additional research is suggested to investigate conductors' functional priorities and why they come to differ, particularly conductors who may pay attention to mechanics or expression to a lesser degree than other functions.

The relatively small subject-to-variable ratio was a potentially critical problem in the research. Given the sizable number of conducting issues gleaned from the research and represented in the survey, a moderate return rate was anticipated; even so, a low return rate occurred consistently at all three university data collection sites, with multiple reminders failing to attract an adequate number of additional volunteers. Monetary or other incentives may have been helpful in the study, but would have limited the sample to a smaller, affordable number of invitees with no guarantee of a higher total return given the tediousness of the survey. Be that as it may, the corroborating results suggest that the

sample's wide range of experience in years, ensemble types, and ensemble age levels was a sampling strength that offset this sampling problem. The size of sample likely generated insufficient variance for a tenable eigenvalue-of-one solution, but the variance obtained with the representatively diverse sample was sufficient for other criteria to indicate a viable solution. Future research of conducting functions has the advantage of a smaller number of variables and shorter survey based on results of the present study.

Apart from the general finding that conductors distinguish functions similarly to those implied in research, the most unique and unexpected discovery is the division of performance technique issues into a Physical Technique Function and an Unrestrained Tone Function. This division reveals opposing aims in conducting: to control energy, strength, and motion versus to release tension, anxiety, and control of tone and tempo. The division led to the discovery of similar contrasts in the set of functions—to control precise mechanics versus to release emotional and musical expression, and to control attention by the conductor's intense motivation versus to share control with musicians. Future research is suggested to explore how conductors, conducting instructors, and conducting students balance these opposing patterns of control and release.

Future research is suggested to develop reliable and valid measures of conducting functions. In the present study, a sufficient number of potential items was associated with each factor to serve as a basis for future measurement refinement. Apart from the highest-loading items, cross loadings help identify ambiguities that can be clarified into more clearly distinguishing survey items. For example, results for "Precise tempo indications" point out an ambiguity between tempo as a matter of mechanical precision and plural indications of tempo as a matter of expression; likewise for "Responding to changing legato, staccato, and marcato styles," articulation styles can be a matter of mechanical precision and then again the list of styles implies changing expressions. In another example, the cross loading on "Conducting with a sense of unity with the ensemble rather than dominance" suggests an ambiguity between the ensemble unity required in producing an unrestrained tone and the non-dominance of psychosocial collaboration. However, cross loading items for which separate issues cannot be identified, such as "Enthusiasm of gestures" or "Dramatizing the story in the music," should be omitted from future measurement development, as they would be least useful in distinguishing one function from another. The focus of future measurement development should be to determine items that most clearly distinguish each function. Likewise, low loadings across all factors for two items, "Left hand mirroring of right hand patterns" and "Expressing the mood of the music," make it most obvious not to use these items in future measurement development, though it does not leave out the possibility that they may serve functions not adequately represented in the survey items derived from previous research. Further investigation of conductors' intentions behind two-handed pattern mirroring and expressions of mood is suggested.

In conclusion, what is suggested by this research is more essential than the lengthy list of nonverbal conducting behaviors and issues with which this study started—it points to a potential way to streamline the learning, improvement, and practice of conducting within a smaller, more purposeful set of functions. A significant implication for experienced conductors, conducting instructors, and student conductors is the need to pay attention beyond the musical score to also address specific attributes in musicians—their mental alertness, technique, collaborative influence on conducting, and unrestrained release of tone. Also significant is the clear interplay pointed out between the control and release of musical properties, physical effort, and social influence, and a new awareness of the functional benefits and drawbacks of each opposing choice. The six functions provide a more effective framework especially for music educators by establishing clear and distinctive ways to focus students toward a wider variety of curricular areas, all managed without a word within the nonverbal art of conducting.

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About the Authors

Alan J. Gumm is Professor of Music Education at Central Michigan University, and previously taught at McPherson College, Ithaca College, and in public schools in Kansas. He holds a PhD in music education from University of Utah, a MM from Fort Hays State University, and a BA in music education from McPherson College. He is author and editor of books published by Meredith Music, and has articles published in *Journal of Research* in

Music Education, *Bulletin of the Council for Research in Music Education*, *Music Educators Journal*, *Choral Journal*, *Visions of Research in Music Education*, and the *Southeastern Journal of Music Education*. Through research he contributed theories of music teaching style and conducting functions, and his pedagogical explorations led to a "speechless rehearsal" method and extensive multisensory techniques for voice and choir.

Sharyn L. Battersby, assistant professor of music education at The Catholic University of America, holds a BM from the Boston Conservatory of Music, an MM from the Manhattan School of Music, and an EdM and EdD from Columbia University. Dr. Battersby teaches music education courses, supervises student teachers, and serves as the co-faculty advisor for the CUA collegiate chapter of MENC: the National Association for Music Education. She holds both Kodály and Orff certification. She has taught pre-kindergarten through 12th grade choral and general music in New York and New Jersey, served as the Director of Educational Outreach at the Juilliard School and the Director of Education for Midori & Friends, and served on the faculty of Clayton State University in Georgia. Her professional interests have included nonverbal communication, learning communities, teaching and learning, and developing partnerships. She has presented her work at local, state, regional, national, and international conferences and is published in *General Music Today*.

Kathryn L. Simon is currently pursuing a PhD in music education at the University of Miami, where she is the recipient of the prestigious University of Miami Fellowship. Ms. Simon earned the BME and MM degrees in both music education and choral conducting from Central Michigan University and taught kindergarten through twelfth grade general music and choir in northern Michigan. She has presented at state and regional conferences in Florida, Kansas, Michigan, Tennessee, and Wisconsin. Her research interests include the predictors of classroom management practices and challenges of music educators, the development of a nonverbal model of conducting functions, the adolescent changing voice, and the effects of educational policy and high-stakes testing on the field of music education.

Andrew Shankles holds a MM in conducting from Central Michigan University and a BME from Lee University. He currently serves as the Director of Bands at the International Academy East in Troy, MI, which was ranked as the #1 IB school in the U.S. by U.S. News and World Reports. There he directs two concert bands, the jazz band, teaches the International Baccalaureate Music courses as well as the Theory of Knowledge course. His current research interests include conducting pedagogy, technology and music, and incorporating world music in the mainstream music curriculum. He also serves on the board of advisors to the East Shore Wind Symphony "An ensemble for music educators" that brings artistic band music to the rural areas of Northeast Michigan.